GRADUATE CATALOG

2024-2025

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Graduate

Welcome to the UAB Graduate School

The UAB Graduate School seeks to nurture skills that transcend disciplinary boundaries, preparing graduate students to participate successfully in professional and academic arenas. With coordinated and interdisciplinary degree programs available, the UAB Graduate School offers students an opportunity to tailor their educational experience to their own career objective. The Graduate School administers doctoral programs, post-masters education specialist programs, and master's level programs, with additional programs planned for the future.

Graduate students should expect many challenges as they build upon previous educational experiences in new and exciting ways. Graduate education has a distinctly different character from that of undergraduate education. Students explore their chosen area of study in greater depth and are also challenged to reach across boundaries and address larger intellectual issues. There will be greater emphasis on originality and the creation of new knowledge.

The Graduate Catalog outlines all of the policies and procedures pertaining to academic performance, degree progress, academic and non-academic conduct, and student responsibilities. UAB graduate students are expected to be familiar with these policies and to abide by them. Failure to do so may impede a student's progress or may result in disciplinary action and, in some cases, dismissal. In addition to Graduate School policies, students are responsible for knowing and abiding by all UAB Policies and Procedures which can be located in the UAB Policies and Procedures Library here.

The Graduate Council

The Graduate Council is comprised of all graduate program directors. The Graduate Council Advisory Committee is a subset of these program directors who have been designated by their school deans to serve in an advisory capacity to the Graduate School Dean. The Advisory Committee reviews academic requirements, policies, procedures, and Graduate School activities. The committee recommends and approves appropriate changes. Changes in academic requirements and related policies require a majority vote of the Advisory Committee.

The Graduate Council Advisory Committee, through consultation with the Dean, is responsible for developing academic requirements and describing these requirements through appropriate policies. The Dean, through consultation with the Graduate Council, is responsible for developing procedures that effectively enforce academic requirements and implement policies. The Graduate Council Advisory Committee has developed policies and procedures to ensure that high standards for graduate study are maintained at UAB. These policies and procedures are available at the Graduate School's Web site (https://www.uab.edu/graduate/academic-p-and-p).

The Graduate Faculty

Graduate faculty membership may be granted by the Dean of the Graduate School to faculty members who demonstrate a high level of competence in teaching and scholarship. Graduate faculty are nominated by the faculty member's department chair and/or graduate program director, and membership is required of all individuals teaching courses for graduate credit and of members of graduate study committees. A complete listing of the graduate faculty can be found on the Graduate School Web site (https://www.uab.edu/graduate/faculty-staff/graduate-faculty/graduate-faculty-listing).

Graduate School Professional Development Program

Through its Professional Development Program, the Graduate School offers courses, workshops, and seminars designed to help graduate students, postdoctoral fellows, and other academic professionals develop communication and other career-enhancing skills. Current offerings include credit-bearing courses and workshops, as well as free seminars, in writing, funding, presentations, and teaching at the college level. More information and schedules are available at the Professional Development Program's Web site (www.uab.edu/pdp).

Graduate School Deadlines

All Graduate School deadlines, as indicated on the calendar or in explanation of policies and procedures, unless otherwise stated, are final by **5:00 p.m.** on the date specified, by which time all transactions must be completed and documents received in the Graduate School. Transactions and documents requiring the action or approval of graduate advisors, committee members, instructors, department chairs, academic deans, or others prior to receipt by the Graduate School should be initiated by the appropriate person (student, instructor, graduate advisor, or other) sufficiently in advance of the Graduate School deadline for the required actions to be taken and approvals made or declined before the deadline.

About UAB

Over five decades, UAB has evolved from an academic extension center into an autonomous, comprehensive urban university and academic health center within the University of Alabama System. UAB has established wide-ranging programs in the College of Arts and Sciences, the Collat School of Business, the Heersink School of Medicine and the schools of Dentistry, Education and Human Sciences, Engineering, Health Professions, Nursing, Optometry and Public Health, with graduate programs serving all major units. UAB has 22 graduate programs ranked in the top 25 of the U.S. News Best Graduate Schools 2024 rankings.

Fall 2023 enrollment surpassed 21,000 students for the sixth consecutive year, with record international enrollment. The freshman class had an average ACT of 26.2, and a high school GPA of 3.77, and 34 percent were the first in their families to attend college.

UAB is situated near downtown Birmingham and the historic Five Points South district. The campus stretches across 105 city blocks and occupies more than 100 primary buildings. UAB is Alabama's largest single-site employer, with more than 28,000 employees and an annual economic impact on the state exceeding $12.1 billion. In 2021, UAB was named America's No. 1 Best Large Employer by Forbes, topping a list of more than 500 public and private corporations, hospitals, university, Fortune 500 companies and more. UAB also was named the Best Employer for Diversity among colleges and universities by Forbes in 2021. In 2022, Insight into Diversity magazine named UAB a "Diversity Champion" (among 16 universities nationally) for the fifth straight year.

Accreditation

The University of Alabama at Birmingham is accredited by the Southern Association of Colleges and Schools Commission on Colleges

(SACSCOC) to award baccalaureate, masters, educational specialist, and doctorate degrees. The University of Alabama at Birmingham also may offer credentials such as certificates and diplomas at approved degree levels. Questions about the accreditation of the University of Alabama at Birmingham may be directed in writing to the Southern Association of Colleges and Schools Commission on Colleges at 1866 Southern Lane, Decatur, GA 30033-4097, by calling (404) 679-4500, or by using information available on SACSCOC's website (www.sacscoc.org).

Many academic programs have additional accreditation from organizations appropriate to the academic discipline.

If you have questions related to issues such as admission requirements, educational programs, and financial aid that are not answered in this publication, please contact UAB at:

University of Alabama at Birmingham
Office of the Registrar
1300 University Boulevard, Campbell Hall 117A
Birmingham, AL 35294

Mailing address:
1720 2nd Ave S, CH 117A
Birmingham, Alabama 35294-4300
(205) 934-8228
(205) 975-3700 fax
Email: catalog@uab.edu

General Information

Role Statement

UAB's graduate offerings are shaped by its location in the state's largest metropolitan area, by its mandate to serve a large and heterogeneous constituency, by its responsibility to contribute to the economic and professional development of Birmingham and the state, and by its role of providing support to a nationally recognized academic health sciences center.

At the graduate level, programs serve the career needs of educators and business leaders, as well as those involved in advancing the frontiers of the health sciences. Training for health professionals is available through programs at the baccalaureate, master's, doctoral, and professional degree levels.

UAB also has the primary responsibility for meeting the state's health professional needs. It offers a comprehensive range of programs which encompass both basic preparation and sophisticated graduate and specialty training in medicine, dentistry, optometry, nursing, health professions, and public health.

As one of the nation's leading research institutions, UAB emphasizes both basic and applied research. Although the majority of the university's research effort is in the biomedical sciences and related areas, all instructional programs are expected to participate in research activities. UAB's urban setting necessitates the development of research programs that are responsive to the city's economic, social, and cultural needs. Much of the research conducted at UAB is interdisciplinary in nature and is organized through centers that bring together experts in a number of related fields to concentrate on a particular problem or issue. UAB attracts more than $400 million annually in research funding and currently ranks 10th among public universities in funding from the National Institutes of Health. the Carnegie Foundation for the Advancement of Teaching has named the University of Alabama at Birmingham to its list of colleges and universities to receive its 2015 Community Engagement Classification. UAB is one of 51 universities nationally and the only college in Alabama to be classified for high research activity and community engagement.

As the senior public doctoral-level institution in the state's major urban area, UAB is committed to providing comprehensive programs in continuing education consistent with the quality and diversity of its other offerings. The university's faculty, staff, and students also serve as resources to the area through activities related to professional, economic, and cultural growth and development.

Cultural Opportunities

UAB's urban location offers students unique cultural opportunities. Located within walking distance of the campus is the Five Points South district, where local and unique restaurants, shops, art galleries, and music clubs are located. Not far from campus are the Birmingham Museum of Art, the Civil Rights Institute, the historic Alabama Theater, and the Birmingham-Jefferson Convention Complex. Other nearby sites include Sloss Furnace, a post-Civil War iron foundry which has been converted into a museum and informal music hall, and Oak Mountain Amphitheater, an outdoor facility that features music-industry headliners during the spring and summer concert season.

UAB has a flourishing arts program. As many as 30 major music events are produced each season at UAB, in addition to numerous theater productions and student and professional art exhibitions. The Alys Robinson Stephens Performing Arts Center is a state-of-the-art facility featuring 4 formal performance spaces: the 1,300-seat Jemison Concert Hall, the 350-seat Morris K. Sirote proscenium theater, the 170-seat Reynolds-Kirschbaum Recital Hall, and the Odess Black Box Theater, which can seat up to 120.

Student Life

Graduate students at UAB have many opportunities to become involved in the life of the university. Information about additional groups, both on and off campus, can be found in the UAB Student Handbook, *Direction*. Such organizations include: Graduate Student Government (GSG), Black Graduate Student Association (BGSA), Society for Advancement of Hispanics/Chicanos and Native Americans in Science (SACNAS), and Graduate Career Awareness and Trends (GCAT).

Schools and Degrees

This catalog contains information about graduate programs in the College of Arts and Sciences, School of Business, School of Dentistry, School of Education and Human Sciences, School of Engineering, School of Health Professions, School of Nursing, School of Optometry, School of Public Health and the Joint Health Sciences.

Most UAB graduate students are working toward a degree; however, some have other educational goals. Graduate level degrees are usually characterized by the level of master's, specialist or doctoral.

College of Arts & Sciences

Master of Arts

Anthropology
Art History
Communication Management
English

History
Sociology
Psychology

Master of Public Administration

Master of Science

Biology
Chemistry
Computer and Information Sciences
Computer Forensics and Security Management
Criminal Justice
Forensic Science
Mathematics
Physics

Doctor of Philosophy

Applied Mathematics
Biology
Chemistry
Computer and Information Sciences
Medical Sociology
Physics
Psychology

Biomedical Sciences/Joint Health Sciences

Interdisciplinary Themes*

Biochemistry, Structural and Stem Cell Biology
Cancer Biology
Cell, Molecular and Developmental Biology
Genetics, Genomics and Bioinformatics
Immunology
Microbiology
Neuroscience
Pathobiology and Molecular Medicine

*Completion of the training requirements in one of the above interdisciplinary themes provides eligibility for conferral of one of the following PhD degrees:

- Biochemistry and Molecular Genetics
- Cell Biology
- Cellular and Molecular Physiology
- Genetics
- Microbiology
- Neurobiology
- Pathology
- Pharmacology and Toxicology

School of Business

Master of Accounting
Master of Business Administration
Master of Science in Management Information Systems

School of Dentistry

Master of Science

School of Education and Human Sciences

Master of Arts in Education

Arts Education
Community Health
Early Childhood Education
Educational Leadership
Elementary Education
English as a Second Language
Health Education
High School Education
Kinesiology
Music Education
Reading
School Counseling
Special Education

Master of Science

Instructional Design and Development

Educational Specialist

Educational Leadership
Early Childhood Education
Elementary Education
English as a Second Language
Secondary Education
Special Education: Autism Spectrum Disorder
Teacher Leadership

Doctor of Education

Educational Leadership

Doctor of Philosophy

Early Childhood Education
Health Education Promotion

School of Engineering

Master of Science

Biomedical Engineering
Civil Engineering
Electrical Engineering
Materials Engineering
Mechanical Engineering

Master of Engineering

Advanced Safety Engineering and Management
Construction Engineering Management
Design and Commercialization
Information Engineering and Management

Doctor of Philosophy

Biomedical Engineering
Civil Engineering
Computer Engineering
Interdisciplinary Engineering
Materials Engineering

School of Health Professions

Master of Science

Biotechnology
Clinical Laboratory Science
Genetic Counseling
Healthcare Quality and Safety
Nutrition Sciences
Occupational Therapy

Master of Science in Health Administration
Master of Science in Health Informatics
Master of Science in Physician Assistant Studies

Doctorate of Physical Therapy
Doctorate of Science in Administration Health Services

Doctor of Philosophy

Administration Health Services
Nutrition Sciences
Rehabilitation Sciences

School of Nursing

Master of Science in Nursing
Doctor of Nursing Practice
Doctor of Philosophy

School of Optometry

Master of Science

Vision Sciences

Doctor of Philosophy

Vision Sciences

School of Public Health

Master of Public Health
Doctor of Public Health
Master of Science in Public Health
Doctor of Public Health
Doctor of Philosophy

Non-Academic Policies

Student Conduct Code

The purpose of the University of Alabama at Birmingham (“University”) student conduct process is to support the vision, mission, and values of the University and the Division of Student Affairs, and the tenets of the University’s creed, The Blazer Way. Through a student-focused and learning-centered lens, the Office of Community Standards & Student Accountability and the student conduct process uphold individual and community standards; encourage an environment of personal accountability for decisions; promote personal growth and development of life skills; and care for the wellbeing, health, safety, and property of all members of the University community.

The Student Conduct Code (“Code”) describes the standards of behavior for all students and student organizations and outlines rights and the process for adjudicating alleged violations. It is set forth in writing in order to give general notice of non-academic prohibited conduct. The Code should be read broadly and is not designed to define non-academic conduct in exhaustive terms. All students and student organizations are expected to conduct themselves in accordance with the Code. The current version of the Code, which may be revised periodically, is available from Community Standards & Student Accountability or online.

Equal Opportunity and Discriminatory Harassment Policy

UAB is committed to equal opportunity in education and employment, and the maintenance and promotion of nondiscrimination and prevention of discriminatory harassment in all aspects of education, recruitment and employment of individuals throughout the university.

Immunization Policy

UAB requires that first-time entering students, international students and scholars, and students in health-related schools provide proof of immunization against certain diseases.

Non-Resident Tuition Policy

This policy addresses non-resident tuition, certification of residency status by campus officials, and establishment of campus policies to administer an appeals process.

Drug-Free Campus Policy for Students

Unlawful possession, use, manufacture, distribution, or dispensing of illicit drugs, controlled substances, or alcoholic beverages by any UAB student is prohibited.

https://www.uab.edu/students/wellness/policies-resources/drug-free-schools-communities-act

UAB Annual Security & Fire Safety Report

The 2023 UAB Annual Security and Fire Safety Report is now available online. To access it, you can go to the UAB Police Department website at http://www.uab.edu/police and click on “Read the 2023 UAB Annual Security & Fire Safety (Clery) Report,” or go directly to the report at:

https://www.uab.edu/police/images/Annual__Security__and__Fire__Safety__Report.pdf

For a print copy of the report, call (205) 934-4649. The report follows the guidelines mandated by the Federal Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act and contains the following information: reporting incidents; federal campus sex crimes prevention act; missing person procedures; distribution of timely warnings; emergency preparedness, response and evacuation procedures; criminal statistics; fire safety report, etc.

Copyright Policy

The University of Alabama at Birmingham (the "University") is dedicated to instruction, research and service to benefit society and encourages its faculty, staff and students to carry out scholarly endeavors in an open and free atmosphere, and to publish the results of such work without restraint, consistent with applicable law and policy.

Patent Policy

UAB encourages the development of procurement and licensing of patents for inventions in the interest of the public, the inventor, and the university.

Data Protection and Security Policy

Data (electronic) created at UAB must be protected and maintained in accordance with all applicable federal and state laws and university policies.

Student E-Mail Address Policy

November 10, 2003

See also:

Electronic Data Processing Security Policy

Acceptable Use Policy

Network Usage Guidelines

Purpose

UAB provides electronic mail resources in support of its instruction, research, and service activities. The purpose of this policy is to establish the use of electronic mail (e-mail) as one of the official methods for communicating with UAB students.

Official Communications Using E-Mail Addresses

In a similar manner as mail distribution of paper communiqués to a student's "permanent" address is considered an official method for distributions to students, so also are official e-mail messages sent by UAB to a student's "@UAB.EDU" e-mail address considered an official distribution method. For purposes of this policy, "official" communiqués or e-mails as used here are those established as "official" through other approval mechanisms in place at UAB.

Student Requirements and Responsibilities

Every student enrolled at UAB must have an e-mail address that ends with "@UAB.EDU". Such an e-mail address is required for a student to register for UAB credit courses. It is the student's responsibility to obtain an official UAB e-mail address in a timely manner from the UAB e-mail registering system (BlazerID World Wide Web site). This will require the student also to have a valid, current, and reliable electronic mailbox through an Internet Service Provider (ISP) or portal or on a server administered by the student's academic department, or on the central mail service provided by the Office of the Vice President for Information Technology. It is the student's responsibility to check his or her e-mail regularly for distribution of official UAB communiqués. UAB recommends that e-mail be checked at least once a day, when practicable. UAB is not responsible for lost, rejected, or delayed e-mail forwarded by UAB from a student's "@UAB.EDU" address to off campus or unsupported e-mail services or providers. Such lost, rejected, or delayed e-mail does not absolve the student from responsibilities associated with an official UAB communiqué sent to the student's official UAB e-mail address ("@UAB.EDU"). If there is a change in a student's e-mail address to which the"@UAB.EDU" alias address is re-directed, it is the student's responsibility to make the changes in the UAB e-mail registering system.

UAB Responsibilities

UAB will ensure that all students have access to an e-mail account and will provide means for students who do not otherwise have access to e-mail-capable computers to be able to check their e-mail through such mechanisms as computer labs, the UAB libraries, and public terminals. UAB will provide mechanisms to allow students to request that their e-mail addresses not be published in a similar way that other student directory information is not published. However, unpublished e-mail addresses will be used for sending official UAB communiqués to students including communications to a group of students such as a course e-mail list. Students also will be provided mechanisms for requesting that their e-mail addresses not be used for general UAB mailings that are not official communications with students. UAB is not responsible for the handling or mishandling of students' e-mail by non-UAB providers or by unofficial (non-@UAB.EDU) e-mail servers.

Student Records Policy

The University of Alabama at Birmingham student records policy complies with the Family Educational Rights and Privacy Act of 1974, as amended. All students enrolled or previously enrolled at UAB have certain rights with regard to information included in their education records. These rights are the subject of this policy.

Request to Withhold Directory Information PDF

Classroom Scheduling Policy

1. Departments will schedule all multiple lecture and laboratory sections so that student course enrollments will be distributed approximately equally between mornings and afternoons and between the different meeting patterns (TR vs. MWF). Departments will also limit classes taught during peak hours to 50%. Once departments reach the maximum of courses to be taught during peak hours, the remaining courses should be redistributed across non-peak hours.
2. Departments will have the ability to schedule in rooms they manage first. After this, the Registrar's Office will utilize all available classrooms to assist other departments in need of space.
3. Departments must strictly adhere to the approved standard set of time patterns when scheduling course offerings.
4. Because of the regular standard meeting lengths for three hour courses are in 50 and 75 minute time blocks, courses offered during non-standard times should be offered in multiples of these times to avoid end times that preclude the students from registering for courses that may follow the standard section. For example, one non-standard time on Tuesday and another at the same time on Thursday.
5. Classroom enrollment and capacities should be based on the actual enrollment trends over the past few years to ensure a realistic estimate of room needs and proper seat and room assignments. Room capacities will be reviewed each semester by the Office of the

Provost in collaboration with the colleges and departments to ensure the actual instructional capacities for each room are assessed.

6. Departments should strive for 80% occupancy. For example, the number of students enrolled in a class divided by the instructional seating capacity of the room that class is in should be greater than or equal to 80%.
7. Peak hours are between 9:00 am - 1:25 pm Monday through Friday. Departments should strive to provide students a variety of options of course offerings throughout the scheduling week by utilizing non-peak hours. The importance of maintaining the existing course schedule M-F is to allow for courses to be spread more evenly throughout the week. Not only will this be necessary to accommodate significant course demand in response to projected enrollment increases but it will also provide students with greater flexibility when building schedules and further optimize classroom utilization

New Course Review Process

- Unit(s)/School(s) should complete their internal review and approval process for their new courses in September and again optionally in April. The courses need to be submitted as new courses to the registrar by October 1st or May 1st.
- The new course catalog submission deadlines are October 1st and May 1st.
- New course submissions for UCC/GCC review shall include: 1) course number, 2) course title, 3) course catalog description, 4) credit hours, 5) contact person(s), 6) a list of potential course conflicts, if any, and 7) a discussion of why the new course would not create a conflict. Syllabi may be requested by the UCC/GCC for more information and should be provided by the above listed contact person(s) within 7 days.
- Proposals for new Programs, Certificates, and/or Tracks that include new courses will include a 'new course form' for each new course, provided as addendums in the Proposal. These new course forms will facilitate review of new courses and prevent an unnecessary secondary review once the new course is listed. The new course forms will be removed by the Provost's office prior to sending a proposal to the Board of Trustees and Alabama Commission on Higher Education.
- New courses will be reviewed by GCC Liaisons (members), Alternates and by Units/Schools/Departments/Program Leadership during the month of October and June.
- If a conflict is noted for a new course, it will the responsibility of the Unit/School noting the conflict to send an email with a detailed explanation about the course conflict to the submitting Unit/School's contact person(s) and copy (Cc) the Chair of the UCC/GCC.
- The leadership of those Units/Schools involved in a potential conflict, will discuss (and meet, if necessary) the conflicting course(s) during the month of November and July, independent of the UCC/GCC Chair and Senate committees.
- If the parties have come to a resolution before the end of November/ July, both units involved shall notify the UCC/GCC Chair of the resolution and its substance, copying the units and leadership that flagged the concern.
- If there is no resolution or a disputed resolution, or the Units/Schools were unable to meet during November, the leadership of both Units/ Schools will present at the next UAB Faculty Senate Curriculum Committee meeting (either December or January or August) for a vote that will determine the final outcome of the new course proposal.

Use of UAB Facilities and Freedom of Expression Policy

The University has a significant interest in protecting the educational experience of its students, in ensuring health, safety, and order on its campus, in regulating competing uses of its facilities and grounds, and in protecting the safety and well-being of those with the right to use its facilities and grounds to engage in protected speech, among other significant interests. This policy applies to all individuals and groups that use UAB facilities. All students and registered student organizations are expected to comply with the Use of UAB Freedom of Expression and Use of UAB Facilities Policy. Any student or registered student organization who is found to have substantially interfered with the protected free expression rights of others shall be subject to a full range of disciplinary sanctions according to the appropriate disciplinary procedures for misconduct up to and including dismissal from the University.

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Pam Paustian, Ph.D., Associate Provost for Academic and Learning Technologies

Scott Phillips, Ph.D., Vice Provost for Innovative Teaching and Academic Engagement

Academic and Student Resources

This section of the catalog describes some of the services, policies, and programs that support and enhance the experience of our students through their stay at UAB.

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Admissions

Admission as a Degree-Seeking Student

UAB welcomes applications from all individuals whose preparation and abilities give them a reasonable chance of success in its programs. All applicants must offer acceptable evidence of ability and intent to meet the academic standards of the university. Degree-seeking graduate students are those accepted into a specific graduate program to work toward a specific advanced degree. In addition to the completed online application, the Graduate School requires an application fee and official transcripts. To be considered official, academic transcripts must be mailed to UAB directly from the college/university attended, sent electronically to the UAB Graduate School by the school's Registrar's Office, or submitted in a sealed envelope bearing a university signature or stamp across the seal.

Admission to the UAB Graduate School requires a recognized baccalaureate, graduate, or professional degree from a regionally accredited (e.g. SACSCOC) college or university, or an international equivalent of a four-year degree. In accordance with the US Department of Education, holders of first-professional degrees are considered to have an entry-level qualification and may undertake graduate study following the award of the first-professional degree. By the start of your first semester, the degree must be awarded and appear on your transcript.

Unofficial transcripts may be utilized for the application review process and must be submitted for **all** post-secondary institutions, including community colleges, high school dual-enrollment, and military credit. During the application process, applicants will have the option to upload an unofficial PDF copy of their transcript(s).

If admitted, the Graduate School must receive an official transcript:

a) from each post-secondary institution where the student earned a degree.

and

b) for any coursework taken after the awarding of a student's bachelor's degree (e.g. as a post-bacc or graduate student)

Standardized academic test scores are not required by the Graduate School; however, they may be required by the academic program so applicants should check with the program to which they are applying. The Graduate School requires English proficiency for international applicants. This requirement is automatically waived for international applicants who earned a bachelor's, graduate, or professional degree in the US with a minimum GPA of 3.00. All other international applicants are required to submit TOEFL/IELTS/IELA/PTEA/Duolingo/TOEFL Essentials test scores that meet these requirements: 80 on the TOEFL, 6.5 on the IELTS, 176 on the IELA, 120 on Duolingo, 53 on the PTEA, 8.5 on TOEFL Essentials. Official test scores must be sent directly to UAB from the testing agencies. Academic programs may choose to waive academic test scores at their discretion based on the qualifications of the applicant. However, the English proficiency requirement may not be waived.

Individual graduate programs often require additional items such as letters of recommendation, a personal essay, or a resume so it is important that applicants are aware of program-specific admissions requirements. Based on the recommendation and rationale of an academic department, the Graduate School Dean's Office may occasionally waive application requirements. This type of waiver request, with rationale, must be submitted in writing by the graduate program. Complete graduate applications are reviewed by graduate program faculty who make an admissions recommendation to the Graduate School. All credentials submitted as part of the application for admission become and remain property of the university and will not be returned to the student, duplicated, or transferred to another institution.

Any change in a student's record prior to enrollment will necessitate a new review of the application. Any omissions or misrepresentations on a student's application for admission will automatically invalidate consideration by and acceptance to UAB. If, after a student is admitted to the university, information comes to light that indicates an applicant did not meet all admission requirements, the applicant's offer of admission will be rescinded.

The application for admission, application instructions, and application deadlines can be accessed at http://www.uab.edu/graduate/admissions.

Admission as a Non-Degree Student

Students who do not wish to pursue a graduate degree at UAB but would like to enroll in graduate courses or those who wish to begin graduate study before being admitted to a degree program can apply as a graduate non-degree seeking student. Registration in non-degree courses requires departmental approval as not all graduate courses are open to non-degree seeking graduate students. There is no limit to the number of graduate non-degree (GN) credit hours a non-degree seeking student can accumulate. However, should a student later wish to enroll as a degree-seeking student at UAB, **no more than 12 semester hours earned as a non-degree graduate student may be applied toward an advanced degree at UAB. Students wishing to apply more than 12 semester hours are required to appeal to the Graduate School Dean for permission**. Should a student be admitted to a degree program, the credit earned while in non-degree seeking status is not automatically acceptable toward the degree.

Because of U.S. immigration requirements, international applicants (i.e., those who are neither U.S. citizens nor permanent residents) typically cannot be considered for the non-degree category unless already residing in the United States. International students should consult immigration laws to determine eligibility.

International Admissions

The University of Alabama at Birmingham welcomes international applicants. An international applicant is neither a citizen nor a permanent resident of the United States. International applicants should consult the

Graduate School website at http://www.uab.edu/graduate/international for information regarding additional admissions requirements.

Change from Non-Degree to Degree-Seeking Status

A student with a non-degree classification who wishes to change to a degree-seeking classification must apply via the degree-seeking application and submit the required documents (transcripts, applicable test scores, and program-specific supporting documents). Degree-seeking admission of non-degree students is neither automatic nor guaranteed.

Readmission as a Degree-Seeking Student

Students who have not registered for three (3) consecutive semesters will be changed to inactive student status and must apply for readmission before they will be able to register for courses at UAB. Degree-seeking students who meet the following criteria are able to apply for readmission by submitting an application for readmission by visiting the Graduate School homepage (uab.edu/graduate) and clicking the “Apply Now” button.

1. Were admitted to a UAB Graduate Degree-Seeking Program within the last five years, and
2. Have registered for and successfully passed at least one graduate course at UAB after being admitted to a UAB Graduate Degree-Seeking Program BUT have not registered for courses for one academic year (3 semesters) or more, and
3. Have not attended any other university or college in the interim, and
4. Wish to return to the graduate program to which they were previously admitted

Readmitted students must meet the degree requirements operative at the time of readmission.

Admission with Contingencies

Students lacking one or more admission requirements may be admitted to a graduate program contingent upon submission or completion of those requirements. Graduate students admitted with contingencies have until the end of their first semester of enrollment to resolve all contingencies. Examples of contingencies that must be resolved are the submission of official transcripts, official test scores, official degree statements, required course completion, etc. Students are informed of specific requirements for continued enrollment and the time allowed for completion at the time of admission. Failure to meet the requirements during the stipulated time will result in a registration hold until the contingency is resolved and may result in dismissal from the Graduate School.

Admission of Students Previously Dismissed

When an individual applies to a graduate program, a significant part of the admissions decision involves an estimate, based on the applicant’s academic history, of whether the applicant can perform satisfactorily at the graduate level. Applicants who have previously been academically dismissed from the Graduate School must present convincing evidence to program faculty and the Graduate School Dean that substantial improvement has occurred so that it is probable that the applicant can now perform at the required level in graduate work. In general, students are not admitted to a graduate program from which they have been previously dismissed.

Dual Degree Programs

UAB offers many opportunities for students to pursue two advanced degrees concurrently.

Students wishing to be enrolled in an approved dual degree program must submit a degree-seeking application and be admitted to each program individually. The minimum number of credit hours required for each degree must be met. Courses may not be double-counted and are only allowed to fulfill requirements for one degree.

Accelerated Learning Opportunities

UAB offers several options for high-achieving undergraduates to accelerate the time and cost necessary to complete both their undergraduate and graduate degrees. These include Accelerated Bachelors/Masters Programs (ABM), Fast-Track programs, and Early Acceptance. For more information visit: https://www.uab.edu/graduate/programs/accelerated-learning-opportunities

Accelerated Bachelors/Masters Program

The accelerated bachelors/masters (ABM) program allows undergraduate students to share credits toward both an undergraduate and graduate degree. Through ABM, an undergraduate student can take courses that count simultaneously toward their undergraduate and graduate programs. Once admitted, an ABM student can take up to 12 hours of approved 500/600-level graduate courses that will count towards both the undergraduate and graduate degree. This can significantly shorten the time it takes to earn a master’s degree.

Requirements

UAB undergraduate, degree-seeking students may start the ABM program once they have earned 60 or more undergraduate hours, at least 36 of which must be earned at UAB. Students admitted to UAB as transfer students are eligible to apply to an ABM program after earning 60 or more undergraduate hours, at least 24 of which must be earned at UAB.* ABM differs from traditional Fast-Track programs in that, at the time of application and enrollment, eligible students must have a UAB undergraduate grade point average of at least 3.5 (or higher if required by their program). Programs may require a higher GPA for admission and/or not permit the full 12 hours to be shared between programs. Post-baccalaureate students are not eligible to apply to an ABM or Fast-Track program.

Permission to take graduate courses will be granted by the Graduate School if the student has met the criteria above as well as other minimum requirements for graduate admission. Upon admission to the Graduate School, an ABM student will begin a program of study leading to the master’s degree, as approved by his or her department and by the Graduate School. Students must maintain a cumulative GPA of 3.0 or higher in all graduate and undergraduate coursework. Programs may set higher requirements or require specific grades in individual courses.

In addition to any graduate-level coursework taken in a given term, undergraduate students enrolled in an Accelerated Bachelor’s/Master’s program must enroll in a minimum of 6 undergraduate hours. ABM hours approved as shared credit count toward this minimum. Students enrolled in a summer term OR in the final semester of their undergraduate program who have less than 6 hours remaining are exempted from this

requirement. ABM students must submit an application for degree and graduate in the term in which undergraduate degree requirements are met, at which point they will transition to graduate student status. Other exceptions to this policy must be approved by the Graduate School.

*All UAB undergraduate students must adhere to the residency requirement outlined in the undergraduate catalog.

How to Apply

Students who meet the above requirements are eligible to apply to an ABM program after completing the following steps:

- Meet with Accelerated Learning Opportunities Advisor to confirm eligibility and review application requirements.
- Meet with Undergraduate Advisor and the relevant Graduate Program Director(s) to discuss program requirements.
- Complete the ABM Form (including all approvals) and return it to the Graduate School.*
- Submit departmental application materials (as required by program).

*Once an ABM Form has been submitted and approved, a student can adjust future shared credit courses only. Students are not permitted to alter their ABM Form to exclude courses that have already been shared between their degrees. Other exceptions to this policy must be approved by the Graduate School.

Program Completion

Upon completing an undergraduate degree, students will be recertified as graduate-level degree-seeking students and charged the graduate tuition rate.

Fast Track Programs

Fast Track programs allow students to apply to master's degree program before finishing their undergraduate degree. Beginning graduate coursework while enrolled as an undergraduate allows students to pay undergraduate tuition rates and accelerate the time needed to complete their master's degree. While hours cannot be shared between the two programs, certain masters programs allow students to waive equivalent course content covered while enrolled in their undergraduate degree.

Requirements

Requirements vary by program, but typically require at least 60 undergraduate hours, at least 36 of which must be earned at UAB, and a 3.0 GPA to enroll in master's courses. Students admitted to UAB as transfer students are eligible to apply to an ABM program after earning 60 or more undergraduate hours, at least 24 of which must be earned at UAB.*

Additionally, individual programs may specify required prerequisite courses, only be available to certain undergraduate majors, or require the completion of the bachelor's degree prior to admission.

In addition to any graduate-level coursework taken in a given term, undergraduate students enrolled in a Fast-Track program must enroll in a minimum of 6 undergraduate hours. Students enrolled in a summer term OR in the final semester of their undergraduate program who have less than 6 hours remaining are exempted from this requirement. Fast Track students must submit an application for degree and graduate in the term in which undergraduate degree requirements are met, at which point they will transition to graduate student status. Other exceptions to this policy must be approved by the Graduate School.

*All UAB undergraduate students must adhere to the residency requirement outlined in the undergraduate catalog.

Program Completion

Upon completing an undergraduate degree, students will be recertified as graduate-level degree-seeking students and charged the graduate tuition rate.

Early Acceptance to Graduate School

Early Acceptance Programs are designed for academically superior high-school students. Early Acceptance Programs allow high achieving students to be conditionally admitted into a graduate program at the same time they are admitted to an undergraduate program.

Requirements

Eligible students will be notified at the time of matriculation. In order to maintain eligibility for the Early Acceptance program, students must maintain a 3.5 UAB undergraduate GPA, meet all relevant pre-requisites of the program they wish to pursue, and maintain continuous enrollment while at UAB.

Undergraduate Enrollment in Graduate Certificates

Some certificates may open enrollment to undergraduate students on a case by case basis, allowing students to potentially complete a graduate certificate at the same time they earn their undergraduate degree. Enrollment in a graduate certificate is not permitted until the student has earned at least 60 undergraduate hours, 36 of which must have been completed at UAB, with a 3.0 institutional GPA. In addition to academic standing requirements administered at the undergraduate level, once admitted, students must maintain a 3.0 in all graduate coursework.

Awarding of a graduate certificate is contingent upon a student completing all requirements of their undergraduate degree, and cannot be awarded until these requirements are met.

Concurrent Degrees

Students who do not qualify for a combined degree program but wish to begin work toward a second graduate degree may enroll in and earn up to 12 semester hours in the secondary program without special permission while simultaneously earning credit toward their original degree. However**, no more than 12 semester hours earned while pursuing the first degree program may be applied toward the second degree without prior approval by both the graduate program and the Dean of the Graduate School.**

UAB Employee Admission

To maintain university accountability, UAB faculty and staff who wish to take occasional graduate courses may only register for these courses after admission to the Graduate School as either a non-degree seeking student or a degree-seeking student. Admission of a UAB employee as a degree-seeking graduate student requires the concurrence of the applicant's department chair and dean(s), as well as the approvals required for other applicants to the same program. For more information

regarding Educational Assistance, visit the UAB Human Resources Web page at http://www.uab.edu/humanresources/home/benefits.

UAB employees who wish to become full-time graduate students and continue to work part-time cannot work more than 10 hours per week outside their commitment to meet the requirements of their pre-doctoral program.

UAB employees who enroll in a Ph.D. program and continue to work full time must meet the following requirements:

1. Are not eligible to be supported by a training grant
2. Cannot be simultaneously supported by a UAB Graduate Assistantship/Traineeship
3. Thesis or dissertation work may not be initiated until the student enrolls in a program (i.e. data generated by the employee/student prior to enrollment that has been submitted for publication or published cannot be included in a thesis or dissertation)
4. Must meet the same set of program requirements as all other students
5. The dissertation committee is responsible for assuring that these stipulations are met
6. The Program Director and dissertation committee must agree in writing to a protracted course of study

Equal Opportunity Policy

UAB administers its educational programs and activities, including admission, without regard to race, color, religion, sex, sexual orientation, age, national origin, disability unrelated to job performance or Vietnam-era or disabled veteran status. The full text of this policy can be found here.

Office of Graduate Admissions

Mailing Address for Documents and Credentials:

G03 Lister Hill Library
1720 2nd Avenue South
Birmingham, AL 35294-0013

Physical Address:

1700 University Boulevard
Birmingham, Alabama 35294-0013
(205) 934-8227
gradschool@uab.edu

Enrollment

Registration

Students must register for all courses for which they wish to earn graduate credit. The UAB class schedule is accessible via BlazerNET located at http://www.uab.edu/blazernet. The class schedule lists the courses offered each semester and provides full details on prerequisites, registration dates, and procedures. Students are able to register for courses as well as adjust their schedule by adding and dropping courses through the end of the drop/add period which is denoted on the academic calendar.

To be enrolled as a full-time graduate student, a student must register for at least 9 semester hours in the fall, spring, and summer semesters. To be classified as a half-time graduate student, they must register for at least 5 semester credit hours in the fall, spring, and summer semesters. Degree-seeking students who wish to receive financial aid must be enrolled at least half-time.

Certain funding sources (e.g., training grants, individual grants, and fellowships) may have additional enrollment requirements that must also be satisfied. In addition, student loan recipients must satisfy certain minimal enrollment requirements to defer repayment. Students should consult with their funding source or the Financial Aid Office to determine these requirements as they apply to their specific situation.

Auditing Graduate Courses

Graduate students who have been formally admitted as either a non-degree or degree-seeking student may audit courses available for graduate credit with the permission of the instructor and payment of appropriate fees. Courses taken for audit credit are not counted toward the hours required for full-time status, are not counted as earned hours, are not assigned a letter grade, and do not impact a student's GPA. Provided the instructor's requirements are met, the course will appear on the transcript with the notation AU.

The Permission to Audit Graduate Level Coursework form, which can be obtained online at www.uab.edu/graduate/online-forms, should be submitted to the Graduate School for approval prior to registration.

Withdrawal from Courses

Graduate students are expected to complete courses for which they have registered unless unusual and unforeseen circumstances require withdrawal. The procedures for withdrawal are specified on BlazerNET. **Mere cessation of class attendance does not constitute withdrawal, either academically or for tuition purposes**. Students who wish to withdraw from a class or classes after the drop/add period must proceed with the withdrawal in BlazerNET no later than the last day to withdraw for the semester, which is denoted on the Academic Calendar at, www.uab.edu/students/academics/academic-calendar. If a student follows the appropriate procedures to withdraw in BlazerNET, a grade of "W" will be entered on the transcript. Withdrawal from a course after the withdrawal deadline requires an academic appeal, which can be obtained online at www.uab.edu/graduate/online-forms, and documentation of extenuating circumstances.

Leave of Academic Absence

A graduate student experiencing extenuating circumstances may request a leave of academic absence for up to one (1) academic year. The Request for Leave of Academic Absence form can be found at the Graduate School Web site at www.uab.edu/graduate/online-forms and requires approval by the student's graduate program director and the Graduate School. Leave of Absences are term-based and students' records will only be updated with a leave of absence status in a term in which they were not registered. If a student is receiving funding and fails to meet the requirements of their assistantship, their stipend can be ended at any time throughout the semester.

Course Numbering System

The scholastic level of UAB courses is indicated by the century number. Courses numbered 500 and above are graduate and post-baccalaureate courses. Courses numbered 500-599 are available to upper-level undergraduate and beginning graduate students. Courses numbered 600 and above are available only to graduate students. Those numbered 600-699 are intended primarily for students at the master's level, with 698

reserved for non-thesis research and 699 reserved for thesis research. Courses numbered 700-799 are primarily for students at the doctoral level, except in the School of Education where the numbers from 700-729 are reserved for courses leading to the degree of Educational Specialist (Ed.S.). The number 798 is reserved for non-dissertation research and 799 for dissertation research. Seminars, practica, individual studies and projects, internships, and residencies will generally carry numbers in the upper range of these centuries.

Undergraduates Seeking Enrollment

The Graduate School allows undergraduate students who are not enrolled in a graduate program the opportunity to take graduate coursework for either undergraduate credit or graduate credit. They are required to fill the Undergraduate Student Enrollment in Graduate Level Coursework form that indicates how they would like the credit to be counted. Undergraduate students not enrolled in a graduate program can take graduate courses, but it is at the graduate program's discretion whether or not the course can fulfill requirements retroactively. The Graduate School will not allow the graduate course to count towards **both** graduate and undergraduate requirements if the student is not enrolled in an ABM.

Withdrawal from the UAB Graduate School

Students who wish to withdraw from the University of Alabama at Birmingham must submit a written request to the Graduate School expressing their intent to withdraw.

Academic Progress

Graduate Credit

For purposes of academic accounting, credits expressed in "semester hours" are assigned to each course. One semester hour of lecture course credit is awarded for 13-15 contact hours per semester. One semester hour of laboratory credit is awarded for approximately 30 hours of work in the laboratory. Students may not earn "credit by examination" at the graduate level.

A graduate student's earned semester hours include all hours in which a grade of C or better or a grade of P in a pass/not pass course was earned. A graduate student's attempted semester hours include all hours for which a student earned a grade of A, B, C, F, P or NP.

Transfer Credit

Previously earned graduate credit with a grade of B or above while enrolled at another regionally accredited graduate school may be eligible for transfer into the student's current degree program if it has not been applied toward another degree (either at UAB or elsewhere). In addition, credit may be awarded for non-collegiate courses in accordance with American Council on Education recommendations and approval of the appropriate department chair and dean. All transfer credit requests must be initiated by the student and require the approval of the graduate program director and the Graduate School. Transfer of Credit forms are available online at http://www.uab.edu/graduate/online-forms. Completion of this form does not guarantee that the transfer credit will be granted. No more than 12 semester hours of graduate credit can be transferred to UAB. Students wishing to request an exception to the transfer credit hour limit must receive the approval of the program director, department chair, and Graduate School Dean. Once transfer credit has been approved, it will be included in the calculation of the grade point average in the student's current UAB program.

In programs offered jointly by UAB and other universities, all graduate credits earned in the program at a cooperating university are eligible for transfer to UAB. If a student earns credit in one UAB graduate program and is later admitted to another program, unused credits from the previous program, if applicable, are eligible for consideration for transfer into the current program.

Grading and Grade Point Average (GPA)

The grade of A indicates superior performance, B indicates adequate performance, and C indicates performance only minimally adequate for a graduate student. Any graduate student completing a course at the 500 level or above with a performance below the C level will receive a grade of F; the Graduate School does not use the grade of D. In some graduate programs, a grade of C is a failing grade. It is the student's responsibility to know and abide by program grading requirements which may be more stringent than that of the Graduate School.

Four (4.0) quality points are awarded for each semester hour in which an A is earned, three (3.0) quality points are awarded for each semester hour in which a B is earned, and two (2.0) quality points are awarded for each semester hour in which a C is earned. No quality points are awarded for a grade of an F. A graduate student's grade point average (GPA) is determined by dividing the total quality points awarded by a student's semester hours attempted at the graduate level. Students can view their cumulative GPA in BlazerNET and can view their term GPA on their transcript which is also available in BlazerNET.

For courses designated as pass/not pass, a grade of P (passing) signifies satisfactory work. A grade of NP (not passing) indicates unsatisfactory work although there is no penalty assessed with respect to the grade point average (GPA).

Other Grade Notations

N (no grade reported) A temporary notation made by the Office of the Registrar if no grade (A, B, C, F, I, or P) is assigned to the student by the course instructor. This notation is used only when the Office of Registrar is unable to obtain a grade from the instructor prior to the issuing of grades for the semester or when the course is designed to extend beyond a single term. It remains the instructor's responsibility to assign a permanent grade. If the instructor has not submitted a grade by the end of the following term, the "N" (no grade submitted) is changed automatically to an "F" (failing) by the Office of the Registrar. The notation "N" cannot be extended. A notation of no grade submitted may not be used to meet a prerequisite requirement. A student cannot graduate with an no grade submitted notation on his or her academic record.

I (incomplete) The temporary notation of "I" (incomplete) may be reported at the discretion of the instructor to indicate that the student has performed satisfactorily in the course but, due to unforeseen circumstances, has been unable to finish all course requirements. An incomplete is never given to enable a student to raise a deficient grade. This notation should not be used unless there is reasonable certainty that the requirements will be completed during the following semester because, at the end of the next semester, the incomplete automatically changes to an F if it has not been replaced with a letter grade. In highly unusual circumstances, a student may request an extension of time to complete the requirements. This request must be submitted in writing in advance of the time when the grade automatically changes to an F

because the approval of the instructor, graduate program director, and the Graduate School are all required.

A student cannot graduate with an I or N grade designation on their record.

W (withdrawn) A notation assigned by the Office of the Registrar reflecting an administrative action initiated by the student in accordance with regulations governing withdrawal from courses. “W” (withdrawn) may not be assigned by the instructor.

Academic Standing

It is critically important that graduate students at UAB understand both the Graduate School’s and their program’s academic standing policy and that they are aware of their own academic standing at all times. For a student to maintain good academic standing in the Graduate School, they must maintain a cumulative grade point average (GPA) of at least 3.0 (B average) and an overall satisfactory performance on pass/not pass courses, as well as not be on probation for an academic integrity violation. Satisfactory performance on pass/not pass courses is defined as earning at least as many hours of P as of NP grades.

A degree-seeking or non-degree-seeking graduate student, who, at the end of any semester, fails to meet the criteria to maintain good academic standing will be placed on academic probation. Students on academic probation must re-establish good academic standing within the next two semesters during which they are enrolled at UAB. Failure to reestablish good academic standing at the end of their second term of enrollment while on academic probation will result in academic dismissal from the UAB Graduate School.

The rules stated above govern academic probation and dismissal administered by the Graduate School. Individual graduate programs may establish and administer program probation and dismissal governed by more stringent requirements. In general, a student’s retention in a specific graduate program is contingent on the faculty’s belief that the student is likely to complete the program successfully. If the faculty ceases to hold this belief at any point, the student may be dismissed from the program. It is a graduate student’s responsibility to be aware of and abide by program academic standing requirements in addition to the general academic standing policy in the Graduate School. Program probation and dismissal policies preempt the Graduate School policies.

Repeated Courses

Graduate students may repeat a course one (1) time in an effort to improve grades and/or to improve understanding of the course content only with the permission of the graduate program. All courses taken and all grades earned are permanently recorded on the student’s transcript. Both grades will also be calculated in the student’s GPA unless the Grade Replacement policy is applied; however, a student is only able to earn credit hours for the same class one time. Students wishing to repeat a course more than one time should seek approval of both their program director and the Graduate School. **Graduate programs may choose to not allow students to repeat courses.**

Grade Replacement

A graduate student who repeats a course taken at UAB and earns a better grade the second time may request a grade replacement in which the grade for the first course be excluded from their GPA calculation. The grade replacement policy may be used a maximum of two (2) times, only once for any course, which allows a student to use grade replacement for two different courses. **Graduate programs reserve the right to not allow grade replacement or to allow less than the Graduate School’s maximum number of grade replacements. In addition, individual programs may have course repeat and grade replacement policy rules in addition to those of the Graduate School.**

If approved, the student’s transcript will show both the original grade and the course repeat grade; however, the first grade will be excluded from the student’s GPA calculation and only the grade points and credit hours earned in the repeated courses will be counted toward degree completion. Once a course grade is replaced, the decision is irrevocable. In accordance with the UAB Academic Honor Code, any course grade of F for academic misconduct supersedes any other grade or notation for that class and therefore is not eligible for grade replacement.

It is the student’s responsibility to notify the Graduate School of their request to apply the grade replacement policy to a repeated course as the process is neither automatic nor guaranteed. The grade replacement policy requires the approval of the graduate program director and the Graduate School. Grade replacement requests must be made prior to degree/certificate awarding. The grade replacement policy can only be applied to grades earned at UAB and may not be applied after the student has graduated.

The Grade Replacement Request form is available online at http://www.uab.edu/graduate/graduate-school-quicklinks/online-forms.

Graduate GPA Adjustment Policy

Occasionally, graduate students may have a cumulative Graduate GPA below 3.0 as a consequence of previous performance in coursework that is no longer valid, and/or taken as part of a program unrelated to that in which they are currently enrolled. When this occurs, Graduate GPA Adjustment may be appropriate.

Once during a student’s graduate academic career, grades from previously completed UAB courses may be petitioned for removal from the cumulative graduate GPA under the following conditions:

- When courses have expired (5 years for masters and 7 years for doctoral) and they

    1) are not credited towards current degree requirements
    2) were not validated via the Validation of Expired Coursework process

  or

- When the degree program has changed and previously completed courses are unrelated to the new degree requirements and are not counted towards degree requirements, regardless of the grade earned

When Graduate GPA Adjustment occurs, all previous graduate coursework will be removed from the graduate GPA calculation except in cases where previous coursework was applied toward a successfully completed program.

Coursework will remain on the academic record and UAB transcript, but will not be included in the student’s graduate GPA calculation.

In accordance with the UAB Academic Integrity Code, any course grade of F for academic misconduct supersedes any other grade or notation for that class and therefore is not eligible for inclusion in the Graduate GPA Adjustment Policy.

Graduate programs reserve the right to not allow Graduate GPA Adjustment.

Grade Changes

Final grades for an I (Incomplete) should be submitted no later than the grade submission deadline of the semester after the notation was originally awarded; Incomplete grades not changed by that time will convert to Fs. In general, grades submitted by graduate faculty members are not subject to change by reason of revision of the teacher's judgment; nor are submitted grades to be revised on the basis of a second trial (e.g., a new examination or additional work undertaken or completed). Grade changes submitted in order to correct an error in computation or transcription must be made within two semesters after the grades were originally submitted. These grade changes must be submitted via BlazerNET and require the faculty member's statement as to the reason for the change, the approval of the department head, and the approval of the dean of the school in which the course is taught.

Time Limitations

Graduate students are generally expected to complete all degree requirements within **5 years of matriculation for masters and certificates, and 7 years of matriculation for doctoral students**. One extension of these time limits can be requested when mitigating circumstances preclude completion of requirements within the time limit. The request for an extension must include a written and signed completion plan outlining the timeline for degree completion. Instructions for preparing a completion plan are available on the Graduate School website at http://www.uab.edu/graduate/graduate-school-quicklinks/online-forms. Time limit extension requests require the approval of the student's dissertation committee (if applicable) as well as graduate program director and must be presented in writing to the Dean of the Graduate School for consideration and approval. Masters and certificate courses taken more than 5 years before graduation and doctoral courses taken 7 years before graduation will not be applied toward a degree without the approval of the graduate program director and Graduate Dean.

Academic Ethics & Misconduct

Graduate students at UAB have joined a distinguished academic community that is guided by a conviction in the worth of knowledge and its pursuit. By virtue of their membership in this community, they accrue many benefits—among them, access to the ideas and materials of others. Graduate students not only learn from others but also engage in the pursuit of new knowledge and, in some instances, teach or provide service to others. Being a member of an academic community and functioning in multiple roles in the community carries with it certain responsibilities.

As members of an academic community, students, faculty, and administrators share a responsibility to seek truths and communicate them to others. As we pursue knowledge and encourage learning, we acknowledge the need for a free exchange of ideas and recognize the importance of listening to and maintaining respect for the views of others. We must always aspire to learn, apply, and communicate to others the best scholarly standards of the disciplines in which we are involved. High scholarly standards demand high ethical standards.

We must commit to learning and communicating the best ethical standards and their application to our disciplines. In interactions with others, we must demonstrate respect for them as individuals, give credit for significant academic or scholarly assistance, and respect the confidential nature of some exchanges. We must adhere to the highest standards of academic conduct, avoiding those acts of misconduct and dishonesty that undermine the purposes of the academic community.

All UAB students are expected to be familiar with the UAB Academic Integrity Code as well as any conduct codes that are specific to their schools or disciplines. The code represents a commitment to integrity in the academic community and a respect for an individual's educational endeavors.

Conduct and Complaints

Student Conduct Code

The Student Conduct Code promotes honesty, integrity, accountability, rights and responsibilities expected of students consisted with the core missions of the University of Alabama at Birmingham. This Code describes the standards or behavior for all students, and outlines student's rights, responsibilities, and the campus processes for adjudicating alleged violations. Behavior that violates UAB standards of conduct listed within the Student Conduct Code and elsewhere will be subject to disciplinary action through the appropriate conduct process. Whether it is determined that an individual or group is responsible for the violation(s), either by direct involvement or by condoning, encouraging, or covering up the violation, appropriate response will occur with respect to the individual(s) and/or group involved.

Academic Integrity Code

The University of Alabama at Birmingham expects all members of its academic community to function according to the highest ethical and professional standards. Students, faculty, and the administration of the institution must be involved to ensure this quality of academic conduct. The purpose of the Academic Integrity Code is to support our academic mission and to maintain and promote academic integrity. All students in attendance at UAB are expected to pursue all academic endeavors with integrity, honor, and professionalism and to observe standards of conduct appropriate to a community of scholars.

To view the full Academic Integrity Code policy here.

Student Complaints

Academic Matters

Judgments on academic matters are most appropriately made by individuals with expertise in the particular academic discipline involved. For this reason, complaints by students on academic matters are the responsibility of the department and school involved. Normally, such complaints can be resolved quickly through discussion with the faculty directly involved. In rare situations where such resolution does not occur, the student should contact the chair of the appropriate academic department to file a formal grievance. For programs where no department chair is available, the grievance should contact the school's Associate Dean.

The student's grievance should be submitted in writing and accompanied by any appropriate documentation. Grievances should be submitted at the earliest possible time. Consideration will not be given to any grievance submitted later than the end of the term immediately following the term in which the matter in question arose. The department should acknowledge the date the grievance is received and provide notice to the student of when an answer may be expected. It is the responsibility of the department chair to provide an answer to the student within 10 working

days. If the matter cannot be settled within the department, the student has 10 working days from the day the department's response is received to appeal to the dean of the school in which the department is located. The dean should acknowledge receipt of the student's appeal and inform the student of the course of action within 10 working days of the date the appeal is received in the dean's office.

At the dean's discretion, an advisory panel may be appointed to study the disagreement and make a recommendation to the dean. However, it is the responsibility and prerogative of the dean alone to make, in a timely manner, a decision on any academic disputes which have not been resolved at lower levels, and the decision of the dean is final.

Non-Academic Matters

When complaints on non-academic matters cannot be settled by the persons directly involved, a written complaint should be forwarded to the appropriate office. If the administrative officer is unsuccessful in resolving the complaint, it may then be forwarded in writing to the Provost or a designee for further consideration. For specific information concerning the procedures and processes for non-academic complaints and grievances, contact the Office of Student Accountability or visit the following web site https://www.uab.edu/students/accountability/homepage.

Completion of a Degree

Steps Toward Earning a Master's Degree

1. Admission to master's degree program
2. Selection of faculty advisor
3. Maintenance of academic good standing
4. Appointment of graduate study committee— Plan I (Thesis) only
5. IRB and/or IACUC approvals obtained and renewed annually
6. Admission to candidacy—at least one semester before graduation is expected— Plan I (Thesis) only
7. Application for Degree—See https://www.uab.edu/graduate/students/current-students/completing-your-degree/earning-your-degree for each semester's deadline
8. Production of a preliminary version of thesis (Plan I only)
9. Defense of thesis (for Plan I only) (see www.uab.edu/graduate/students/current-students/theses-dissertations/candidacy-deadlines)
10. One PDF of the defended committee- approved thesis (Plan I only) submitted online no later than 2 weeks (10 business days) after the published public defense deadline
11. Conferring of degree

Faculty Advisor

Immediately after a degree-seeking student enters the UAB Graduate School, a member of the faculty of the graduate program to which the student has been admitted should be assigned to serve as the student's advisor. The assignment may be a temporary arrangement. The student and the advisor should confer about courses and any special work to be taken on the basis of the student's previous experience and the requirements of the graduate program.

Plan I or Plan II

The Graduate School recognizes two principal paths, known as Plan I and Plan II, that lead to the master's degree. Where both Plan I and Plan II are available within the same graduate program, an early and meaningful choice should be made by the student, in close consultation with the student's advisor. A change in choice of plans requires the approval of the program director.

Plan I requires the completion, in good academic standing, of at least 24 semester hours of appropriate graduate work and 6 semester hours of thesis research for a total of at least 30 semester hours, with the presentation of an acceptable thesis embodying the results of original research work.

Plan II may not require research and does not require a formal thesis. A minimum of 30 semester hours of appropriate graduate work must be completed in good academic standing. Although thesis research is not required as part of a Plan II course of study, the student is often expected to gain insight into the techniques of problem posing and problem solving and to use these insights to prepare a written report.

Graduate Thesis Committee

Traditionally, graduate study is highly flexible and individualized. A specific plan of study should be developed as soon as possible upon matriculation. Graduate thesis committees, often chaired by the student's advisor, are appointed to guide the student toward their degree. Some graduate programs do not use a graduate thesis committee for Plan II students, particularly when flexibility in the course of study is limited by accreditation and other external constraints. Graduate thesis committees should consist of at least three Graduate Faculty members, each of whom must have credentials equal to or exceeding that of the degree that the student is pursuing, must have been approved by the Graduate School Dean for Graduate Faculty status, and should be able to contribute some relevant insight and expertise to guide the student. In addition, one committee member should be from outside the student's graduate specialization. Graduate thesis committees cannot be comprised of faculty who are related to each other, the student, or otherwise fall under the Family or Household Member designation as defined in UAB's policy on nepotism. Exceptions to this policy must be requested by the student and approved by the Graduate School Dean.

Recommendations for graduate thesis committee membership are submitted by the advisor and the student to the graduate program director, who subsequently submits these recommendations to the Graduate School Dean. Changes to a student's committee must be submitted on the Request to Change Graduate Study Committee form available at www.uab.edu/graduate/online-forms. Graduate faculty appointees and instructions for requesting new appointments are available at www.uab.edu/graduate/gradfaclist. New Graduate Faculty appointments should be requested by the department and approved by the Graduate School Dean prior to being listed on the recommendation form to serve as a member of a student's committee. Graduate Faculty status definitions are available at www.uab.edu/graduate/definitions-of-graduate-faculty-categories.

Minimum Course Credit Requirements

The Graduate School requires a minimum of 30 semester hours for students in masters programs. Program requirements for course work may exceed the Graduate School minimum but may not be less than the Graduate School minimum.

- Plan I requires the completion of at least 24 semester hours of appropriate graduate work, of which a maximum of 9 hours of non-thesis research (i.e. 698) can be applied, and 6 semester hours of thesis research (i.e. 699) over a minimum of one semester in candidacy.

- Plan II requires the completion of 30 semester hours of core graduate coursework directly related to the discipline. A maximum of 9 semester hours of non-thesis research (i.e. 698) may be applied.

Minimum Grade Point Average (GPA) Requirements

The Graduate School requires that students be in good academic standing in order to graduate. All masters students must have a 3.0 graduate-level GPA, as well as a 3.0 in their individual program in order to graduate. Program GPA requirements for course work may exceed the Graduate School minimum but may not be less than the Graduate School minimum.

Additional Program Requirements

In consultation with the faculty, the director of each graduate program will specify any additional requirements, such as a reading knowledge of a foreign language or a working knowledge of statistics, which are considered essential to mastery of the academic discipline. Such requirements become conditions for the completion of the degree. The program may also adopt a system of examinations that the student must pass at various points in the program.

Admission Into Degree Candidacy (Plan I Only)

Admission to candidacy is a formal step acknowledging that the student has been performing well and is likely to complete the degree. Candidacy admission is recommended by the student's graduate study committee and approved by the graduate program director and the Graduate School Dean. For Plan I students, admission should occur when the student has obtained an adequate background and has provided the committee with an acceptable proposal for thesis research. In addition, the Vice President for Research requires that all students engaging in research complete the applicable Responsible Conduct in Research requirements which can be found here. Responsible Conduct in Research requirements must be completed within four (4) years prior to applying for candidacy as they expire after that time. Students do not have to complete all coursework prior to admission to candidacy if the graduate study committee ascertains that the student has an adequate foundation in the discipline. Students must be in good academic standing to be eligible for admission to candidacy, and admission must take place no later than one semester before the expected graduation. Before being admitted to candidacy, students must complete a Research Compliance Verification form and attach photocopies of the appropriate assurance letters and/or forms. Students must be admitted to candidacy before they can register for thesis research hours (i.e., 699). Applications for Admission to Candidacy are available online at www.uab.edu/graduate/online-forms.

IRB and IACUC Approval

In general, if a student's research involves human or animal subjects, approval from the IRB or IACUC must be documented **before** admission to candidacy can be approved. Certain programs may have national accrediting or curricular requirements that necessitate admission into candidacy prior to seeking IRB/IACUC approval. For these students, IRB or IACUC approval must be submitted in order to register in a subsequent semester. IRB/IACUC approvals must be kept current until the research is completed. For ways in which students can be added to a protocol, refer to the Tip Sheet for Students Involved in Research Involving Human or Animal Subjects. The IACUC form must display the appropriate research protocol number.

Application for Degree/Certificate

Candidates for a master's degree must notify their program and the Graduate School of their intent to graduate by submitting the Application for Degree/Certificate by the appropriate deadline. The application is accessible through BlazerNET by clicking Links/Forms and selecting Apply for Graduate Degree/Certificate. Note that some programs may have an earlier submission deadline than the Graduate School so students should check their department/program website for more information. Upon receipt of the Application for Degree/Certificate, both the graduate program and the Graduate School will audit the students' requirements to ensure the degree can be awarded. UAB's Graduation Planning System (GPS) contains a personalized degree audit that includes all courses required to earn the degree and will display completed, in-progress, and outstanding requirements. GPS is accessible through BlazerNET by clicking the GPS button in the menu on the right side of the page.

Master's students must be registered for at least one (1) hour of 699 research credit during the semester in which degree requirements are completed. If degree candidates are covered by the student health insurance policy, hold an assistantship, or have student loans, it may be necessary to register for a prescribed minimum number of credit hours to retain these benefits. Students should check with the appropriate office(s) if retention of these benefits is a concern.

Thesis

The thesis required under Plan I should present the results of the candidate's original research and the interpretation of those results. The document should also demonstrate the candidate's acquaintance with the literature of the field and the proper selection and execution of research methodology.

The final approved version of the thesis must be submitted as a single PDF for final review no later than 2 weeks (10 business days) following the public defense. Master's students must submit the Approval Form, signed by each committee member and the program director. Signatures of committee members and program directors on the approval form indicate their assurance that they have examined the document and have found that it is of professional quality from all standpoints, including writing quality, technical correctness, and professional competency, and that the document conforms to acceptable standards of scholarly presentation. The Graduate School is then responsible for ensuring that the final version of the thesis meets the physical standards required of a permanent, published document and for adherence to the requirements stated in the UAB Format Manual.

If, in the opinion of more than one member of the thesis committee, the student has failed the thesis defense, there is no consensus to pass. The chair of the committee shall notify the student in writing that the thesis fails to meet the requirements of the program and will share the reason(s) for failure. If the student resubmits or submits a new thesis for consideration by their graduate program, at least two members of the new examining committee shall be drawn from the original committee. If the modified or new thesis also fails to meet the requirements of the program, the student shall be dismissed from the graduate program.

If only one of the three committee members dissent, that individual must submit a letter outlining the reasons for their dissent to the student's advisor. The advisor and student may then prepare a rebuttal statement

that is submitted, along with the letter of dissent, to the advisory or executive committee of the program for review. The advisory committee can then decide to accept or reject the rebuttal statement. If the rebuttal is accepted, the student is passed on their thesis defense. If the rebuttal is rejected, the advisory committee can recommend to the student or advisor potential steps necessary to remediate the thesis and potentially also the work therein, or the committee can recommend that the student be dismissed from the program.

Thesis Defense

Under Plan I, the final examination should take the form of a presentation and public defense of the thesis, followed by an examination of the candidate's comprehensive knowledge of the field. The time, date, and location of this examination is reported to the Graduate School via the online Request for Thesis or Dissertation Approval forms and must be (submitted at least 10 days before the public defense). The meeting must be appropriately announced on campus, must be open to all interested parties, **and must take place before the posted semester Thesis or Dissertation defense deadline**.

The final examination for Plan II students should take the form of a comprehensive survey of the candidate's activities in the graduate program. A Plan II final examination is not required in some graduate programs.

Commencement

UAB holds a semesterly commencement ceremony at the conclusion of each Fall, Spring, and Summer semester. Students may participate in the ceremony that corresponds to their graduation term. Requests to attend a ceremony outside of a student's graduation term must be made in writing to the Graduate School and will be reviewed on a case by case basis by the Graduate School Dean. Commencement information is available here and students may indicate their attendance in BlazerNET.

Award of Degree

Upon approval by the Graduate School Dean and payment of any outstanding financial obligations to the university, the President confers students' degrees by authority of the Board of Trustees. UAB does not determine the official degree type awarded as this is governed by the Alabama Commission on Higher Education and the Board of Trustees after receiving a program proposal. Students' majors will be reflected on their transcript.

Steps Toward Earning a Doctoral Degree

1. Admission to doctoral degree program
2. Selection of faculty advisor
3. Maintenance of good academic standing
4. Appointment of graduate study committee
5. Passing of comprehensive examination
6. IRB and/or IACUC approvals obtained and renewed annually
7. Admission to candidacy— no later than two semesters before expected graduation
8. Application for degree— by the posted deadline available at https://www.uab.edu/graduate/students/current-students/completing-your-degree/earning-your-degree
9. Draft of preliminary version of dissertation
10. Review of the draft by committee members
11. Revisions made to dissertation in response to committee feedback
12. Defense of dissertation (see http://www.uab.edu/graduate/deadline- dates)
13. A PDF of the defended committee-approved dissertation to UAB/ProQuest submission web site --no later than 2 weeks (10 business days) following the published deadline date for the public defense
14. Conferring of the doctoral degree

Doctoral Degree Overview

The doctoral degree is granted in recognition of scholarly proficiency and distinctive achievement in a specific field of an academic discipline. The first component is demonstrated by successful completion of advanced coursework of both a didactic and an unstructured nature as well as by adequate performance on the comprehensive examination. Traditionally, the student demonstrates the second component by independently performing original research. In certain doctoral programs, performing a major project may be acceptable even though it may not consist of traditional research. However, in all programs, with the exception of DPT and DNP, a dissertation presenting the results of the student's independent study is required.

The Graduate School also recognizes professional doctorates awarded in preparation for the autonomous practice of a profession. Professional doctorates are accredited programs of study usually designed to prepare students for the delivery of clinical services or to assume specific types of administrative responsibilities. Students in professional doctorate programs must demonstrate competence in clinical practice and/or scholarship but are not required to conduct and defend original independent research. In lieu of a dissertation, students in programs designated as professional doctorate programs are required to demonstrate that they are capable of evaluating existing research, applying it to their professional practice, and expanding the body of knowledge on which their professional practice is based. This requirement is often met by the design and completion of a research or scholarly project submitted in writing and presented formally before the faculty in the program.

Faculty Advisor

Immediately after a degree-seeking student enters the UAB Graduate School, a member of the faculty of the graduate program to which the student has been admitted should be assigned to serve as the student's advisor. The assignment may be a temporary arrangement. The student and the advisor should confer about courses and any special work to be taken on the basis of the student's previous experience and the requirements of the graduate program.

Graduate Thesis Committee

A graduate thesis committee should be formed as soon as possible upon matriculation to guide the student in a program of courses, seminars, and independent study designed to meet the student's needs and to satisfy program and Graduate School requirements. Doctoral graduate thesis committees should consist of at least five graduate faculty members, each of whom should be able to contribute some relevant insight and expertise to guide the student and must have credential equal to or exceeding that of the degree the student is pursuing. In addition, one or two committee member(s) should be from outside the student's graduate specialization. In all cases, at least three of the committee

must be comprised of UAB Graduate Faculty members. Graduate thesis committees cannot be comprised of faculty who are related to each other, the student, or otherwise fall under the Family or Household Member designation as defined in UAB's policy on nepotism. Exceptions to this policy must be requested by the student and approved by the Graduate School Dean.

Committee members who are not already UAB Graduate Faculty must be granted Ad Hoc Graduate Faculty status. Recommendations for graduate thesis committee composition are submitted by the advisor and the student to the program director, who subsequently submits these recommendations to the Graduate School Dean.

Changes to a student's committee must be submitted on the Request to Change Graduate Study Committee form available at http://www.uab.edu/graduate/online-forms. Graduate faculty appointments and instructions for requesting new appointments are available at http://www.uab.edu/graduate/gradfaclist. New Graduate Faculty appointments should be requested by the department and approved by the Graduate School Dean prior to any faculty member being recommended for placement on a student's committee. Graduate Faculty status definitions are available at http://www.uab.edu/graduate/definitions-of-graduate-faculty-categories.

Minimum Course Credit Requirements

The Graduate School has minimum course credit requirements for students in doctoral programs. Program requirements for course work may exceed the Graduate School minimum but may not be less than the Graduate School minimum.

If entering with a baccalaureate degree, a student is required to earn a minimum of 72 credit hours comprised of the following:

1. Completion of 48 semester hours of coursework prior to candidacy:
   - A minimum of 22 hours of core coursework directly related to the discipline
   - No more than 16 hours of non-dissertation research (i.e. 798) can be counted
   - No more than 10 hours of labs, seminars, or GRD and CIRTL courses can be counted
2. Completion of 24 semester hours of research-based work over a minimum of two semesters in candidacy which can be designated as either:
   - A minimum of 24 semester hours in 799 dissertation research **OR**
   - A minimum of 12 semester hours in 799 dissertation research **AND**, either during or before candidacy, 12 semester hours in other appropriate research-based coursework which has been approved by the graduate student's program

If entering with a previously earned master's degree appropriate to the doctoral degree field, a student is required to earn a minimum of 51 credit hours comprised of the following. These requirements also apply to students with previously earned M.S., D.V.M., D.M.D., D.D.S., etc.:

1. Completion of 27 semester hours of coursework prior to candidacy:
   - A minimum of 15 hours of core coursework directly related to the discipline
   - No more than 6 hours of non-dissertation research (i.e. 798) can be counted
   - No more than 6 hours of labs, seminars, or GRD and CIRTL courses can be counted
2. Completion of 24 semester hours of research-based work over a minimum of two semesters in candidacy which can be designated as either:
   - A minimum of 24 semester hours in 799 dissertation research **OR**
   - A minimum of 12 semester hours in 799 dissertation research **AND**, either during or before candidacy, 12 semester hours in other appropriate research-based coursework which has been approved by the graduate student's program

Up to 12 credits of course work that have not been applied toward meeting the requirements for an earned degree taken at UAB or other institutions may be used to satisfy these course credit requirements upon approval of the graduate program director and the Graduate School Dean. Courses which have been previously applied toward meeting the requirements of another degree are not eligible to satisfy minimum course credit requirements. The student's graduate department or program should provide a course planning curriculum worksheet along with the student's application for degree. This worksheet should detail the courses taken which are intended to be used toward meeting degree requirements.

Residence Requirement

The nature of doctoral study requires close contact between the student and the faculty of the graduate program, and the individual investigation or other special work leading to the dissertation must be performed directly under the guidance and supervision of a full member of the UAB graduate faculty. The Graduate School requires doctoral students to enroll for a minimum of nine semesters in their doctoral degree program at UAB. Individual graduate programs may require a longer period of residence. The Graduate School does not require these nine semesters to be consecutive (i.e. fall, spring, and summer of each year); however, many programs choose to do so and as such, students are responsible for being aware of program-specific requirements.

Minimum Grade Point Average (GPA) Requirements

The Graduate School requires that students be in good academic standing in order to graduate. All masters students must have a 3.0 graduate-level GPA, as well as a 3.0 in their individual program in order to graduate. Program GPA requirements for course work may exceed the Graduate School minimum but may not be less than the Graduate School minimum.

Additional Program Requirements

In consultation with the faculty, the director of each graduate program will specify any additional requirements, such as a reading knowledge of a foreign language or a working knowledge of statistics, that are considered essential to mastery of the academic discipline. Such requirements become conditions for the completion of the degree.

Comprehensive Examination

The scholarly proficiency of a doctoral student in the chosen field of study must be evaluated by comprehensive examination. The conduct of these examinations is the responsibility of the graduate program in which the student is enrolled and may consist of either individual examinations in several appropriate areas or a single combined examination. When both written and oral examinations are given, the written examination should precede the oral so that there is an opportunity for the student to clarify any misunderstanding of the written examination questions.

Comprehensive exams should be administered no later than the end of the third year of the student's program.

Admission Into Degree Candidacy

Admission to candidacy is a formal and important step forward in a student's pursuit of the doctoral degree. By approving admission to candidacy, the graduate student's committee indicates its confidence that the student is capable of completing the proposed research project and the doctoral program. When the student has passed their comprehensive examination, satisfied any program requirements for foreign language proficiency or mastered special research tools, and presented to the graduate study committee an acceptable proposal for dissertation research or special study, the committee will recommend to the Graduate School Dean that the student be admitted to degree candidacy. In addition, the Vice President for Research requires that all students engaging in research complete the applicable Responsible Conduct in Research requirements which can be found here. Responsible Conduct in Research requirements, including successful completion of GRD 717, must be completed within four (4) years prior to applying for candidacy as they expire after that time. A student must be in good academic standing to be admitted to candidacy and admission to candidacy must take place at least two semesters before the expected completion of the doctoral program. Students must be admitted to candidacy before they can register for dissertation research hours (i.e., 799).

IRB and IACUC Approval

If the research involves human or animal subjects, approval from IRB or IACUC must be documented before admission to candidacy can be approved and IRB/IACUC approvals must be kept current until the research is completed. For ways in which students can be added to a protocol, refer to the Tip Sheet for Students Involved in Research Involving Human or Animal Subjects. The IACUC form must display the appropriate research protocol number.

Application for Degree/Certificate

Candidates for a doctoral degree must notify their program and the Graduate School of their intent to graduate by submitting the Application for Degree/Certificate by the appropriate deadline. The application is accessible through BlazerNET by clicking Links/Forms and selecting Apply for Graduate Degree/Certificate. Note that some programs may have an earlier submission deadline than the Graduate School so students should check their department/program website for more information. Upon receipt of the Application for Degree/Certificate, both the graduate program and the Graduate School will audit the students' requirements to ensure the degree can be awarded. UAB's Graduation Planning System (GPS) contains a personalized degree audit that includes all courses required to earn the degree and will display completed, in-progress, and outstanding requirements. GPS is accessible through BlazerNET by clicking the GPS button in the menu on the right side of the page.

Doctoral students must be registered for at least one (1) hour of 799 dissertation research credit during the semester in which degree requirements are completed. If degree candidates are covered by the student health insurance policy, hold an assistantship, or have student loans, it may be necessary to register for a prescribed minimum number of credit hours to retain these benefits Students should check with the appropriate office(s) if retention of these benefits is a concern.

Dissertation

The results of a candidate's individual inquiry must be presented in a written dissertation comprising a genuine contribution to knowledge in the particular academic field. The document should also demonstrate the candidate's acquaintance with the literature of the field and the proper selection and execution of research methodology.

Signatures of committee members and program directors on a student's approval forms indicate their assurance that they have examined the document and have found that it is of professional quality from all standpoints, including writing quality, technical correctness, and professional competency, and that the document conforms to acceptable standards of scholarly presentation. The Graduate School is then responsible for ensuring that the final version of the dissertation meets the physical standards required of a permanent, published document and for adherence to the requirements stated in the UAB Format Manual which is available online at http://www.uab.edu/graduate/images/acrobat/forms/t heses/FormatManual.pdf.

The final committee-approved dissertation must be submitted for final review as a single PDF no later than 2 weeks (10 business days) following the published deadline date for the public defense. One copy of the signed approval form is submitted to the Graduate School office. Additional information concerning completing graduation requirements and the dissertation submission and publication process is available online at http://www.uab.edu/graduate/theses-and- dissertations-at-uab. The UAB Publication Agreement, Survey of Earned Doctorates, and Graduate School Exit Survey must also be submitted.

Dissertation Defense

The dissertation defense should take the form of a presentation and defense of the dissertation work, which may include an examination of the candidate's comprehensive knowledge of the field. The time, date, and location of this examination is reported to the Graduate School via the online Request for Thesis or Dissertation Approval forms and must be submitted at least 10 days before the public defense. The meeting must be open to all interested parties, publicized on the UAB campus, and must take place before the posted semester thesis and dissertation defense deadline. In addition, candidates must be registered during the semester in which the final examination is taken.

If, in the opinion of two or more of the five members of the dissertation committee, the student has failed the dissertation defense, there is no consensus to pass. The chair of the committee shall notify the student in writing that the dissertation fails to meet the requirements of the program and will share the reason(s) for failure. If the student resubmits or submits a revised dissertation for consideration by their graduate program, at least three members of the new examining committee shall be drawn from the original committee. If the revised dissertation also fails to meet the requirements of the program, the student shall be dismissed from the graduate program.

In the event that only one of the five committee members dissent, that individual must submit a letter outlining the reason(s) for their dissent to the student's advisor. The advisor and student may then prepare a rebuttal statement that is submitted, along with the letter of dissent, to the advisory or executive committee of the program for review. The advisory committee can then decide to accept or reject the rebuttal statement. If the rebuttal is accepted, the student is passed on their dissertation defense. If the rebuttal is rejected, the advisory committee can recommend to the student or advisor potential steps necessary

to remediate the dissertation and potentially also the work therein, or the committee can recommend that the student be dismissed from the program.

Graduate Student Exit Survey

Doctoral graduates are required to take the *Graduate School Exit Survey* as part of graduation requirements. Collecting important information and feedback from graduate students will help to improve the quality of graduate program offerings. After submission of the revised version of a student's final dissertation, they will be contacted via email and provided the secure link to take the electronic survey.

Commencement

UAB holds a semesterly commencement ceremony at the conclusion of each Fall, Spring, and Summer semester. Students may participate in the ceremony that corresponds to their graduation term. Requests to attend a ceremony outside of a student's graduation term must be made in writing to the Graduate School, and will be reviewed on a case by case basis by the Graduate School Dean. Commencement information is available here and students may indicate their attendance in BlazerNET.

Award of Degree

Upon approval by the Graduate School Dean and payment of any outstanding financial obligations to the university, the President confers students' degrees by authority of the Board of Trustees. UAB does not determine the official degree type awarded as this is governed by the Alabama Commission on Higher Education and the Board of Trustees after receiving a program proposal. Students' majors will be reflected on their transcript.

Graduate Level Postbaccalaureate or Post-Master's Certificates

Several UAB graduate programs offer Certificates which do not involve conferral of either a Masters or Doctoral degree. Earning a certificate usually involves taking a specific set of graduate level courses which is designed to provide the Certificate holder expertise in a specialty area of a profession or practice. Certificate programs often consist of 12 or more credits of course work. In some cases the nature of the course work is specified by skill requirements, or may be mandated by State level requirements, for example, by the Alabama State Department of Education.

Certificate requirements vary by discipline. Therefore students should determine what the requirements are of the Certificate program in which they are interested by communicating directly with the program director of the program in which the Certificate is offered. In general, financial aid is not available for certificate programs.

Application for Degree/Certificate

Candidates for a graduate-level certificate must notify their program and the Graduate School of their intent to graduate by submitting the Application for Degree/Certificate by the appropriate deadline. The application is accessible through BlazerNET by clicking Links/Forms and selecting Apply for Graduate Degree/Certificate. Note that some programs may have an earlier submission deadline than the Graduate School so students should check their department/program website for more information.

Students pursuing state teacher certification do not need to complete this process.

Upon receipt of the Application for Degree/Certificate, both the graduate program and the Graduate School will audit the students' requirements to ensure the certificate can be awarded. UAB's Graduation Planning System (GPS) contains a personalized audit which includes all courses required to earn the certificate and will display completed, in-progress, and outstanding requirements. GPS is accessible through BlazerNET by clicking the GPS button in the menu on the right side of the page.

Financial Information

Tuition and Fees

Graduate Courses and Fees

The Detailed Tuition and Fee Schedule is available online https://www.uab.edu/students/paying-for-college/detailed-tuition-and-fees under Graduate Programs.

Deadlines

Student account payment deadlines are available on the Academic Calendar for each term at http://www.uab.edu/academiccalendar. Students who do not make the initial payment of 100 percent of the total account balance by the first payment deadline will automatically be enrolled in the Blazer Flex Plan which will include a $25 enrollment fee. The Blazer Flex Plan allows students to make payments in three equal installments. Payment deadline dates are available on the Academic Calendar and at http://www.uab.edu/students/paying-for-college/when-to-pay.

Penalties

Students who fail to pay by the deadline are subject to substantial late fees. Students with delinquent accounts will not be allowed to register at UAB, and transcript requests will not be honored until all accounts are paid in full. The list of penalties is available online at http://www.uab.edu/whentopay/penalties.

How to Pay

Payments can be made via the web with a Blazer ID and Password at www.uab.edu/blazernet. Payments can also be made in Student Accounting Services located on the ground level of the Lister Hill Library. All fees are due by the published deadline, as indicated on the UAB Academic Calendar at http://www.uab.edu/academiccalendar. For tuition questions please call Student Accounting Services at (205) 934-3570.

Contact

Student Accounting Services
1700 University Blvd.
Lister Hill Library G10
Birmingham, AL 35294-0013
(205) 934-3570

Assistantships and Fellowships

In many programs, graduate student awards are available in limited number in the form of assistantships, which require service to the department, or fellowships, which do not require service. The Graduate

School also assists students in preparation of applications for extramural fellowships. The university's Financial Aid Office administers traditional loan, grant, and work-study programs, and students in certain graduate programs may participate in UAB's Cooperative Education Program, combining their studies with paid work experiences. Only degree-seeking graduate students who are registered for at least 5 hours of graduate coursework are eligible for financial aid. For information concerning these programs, contact the Office of Student Financial Aid at (205) 934-8223, or via email at finaid@uab.edu. Students can also visit the office in the Lister Hill Library G20, 1700 University Blvd or view information online at https://www.uab.edu/students/paying-for-college/.

Veterans

Enrolled veterans and dependents who are eligible for federal educational benefits through the Department of Veterans Affairs should apply online at the VA website, www.GIBILL.va.gov. UAB-VA is responsible for verifying enrollment and semester hours and forwarding the information to the Regional VA office. For more information about federal educational benefits, contact UAB-VA in the Office of Veteran Recruitment and Student Services at (205) 934-8804 or via email at veteransaffairs@uab.edu. Students can also visit the office in the Hill Student Center, Room 313, 1400 University Boulevard.

Withdrawing from Courses

To avoid academic penalty, a student must withdraw from a course by the withdrawal deadline shown in the academic calendar and the UAB Class Schedule and receive a grade of W (withdrawn). Failure to attend class does not constitute a formal drop or withdrawal.

For financial aid purposes, the date of last class attendance will be the official date of withdrawal unless otherwise documented. Note that individual schools may have withdrawal rules in addition to the above.

Withdrawal from a course while a possible violation of the Academic Honor Code is under review will not preclude the assignment of a course grade that appropriately reflects the student's performance prior to withdrawal if the violation is substantiated.

Contact

Graduate School
1700 University Boulevard
G03 Lister Hill Library
Birmingham, AL 35294-0013
(205) 934-8227

Financial Aid to Students

Students should apply for financial aid if they need assistance in paying for the cost of education. Students applying for financial aid are considered for all programs for which they are eligible. Assistance generally takes the form of a combination of grant, loan, and employment. The amount of the award is based on the financial need of the student, taking into consideration the student's total expenses and the family's financial circumstances. A nationally recognized method of analysis approved by the federal government is used to determine the family's ability to pay toward the cost of education.

Applying for Financial Aid

Students are encouraged to complete the Free Application for Federal Student Aid (FAFSA) available online at http://fafsa.gov/ in early October. The earliest students can submit the FAFSA is October 1. Instructions and UAB forms are available online at https://www.uab.edu/students/paying-for-college. Since some of the aid programs have limited funding, students are encouraged to submit all required forms to the financial aid office by December 1 for financial aid for the following fall to ensure they receive aid from all programs for which they are eligible. In order to meet the tuition and fee deadlines, completed applications should be submitted no later than 30 days prior to the tuition due date. Students must reapply for financial aid each academic year.

Since procedures and rules are subject to change, students interested in applying for financial aid can receive further information online at https://www.uab.edu/financialaid.

Contact

Student Financial Aid
finaid@uab.edu
(205)934-8223

Mailing address

LHL G20

1720 2nd Ave South

Birmingham, AL 35294

Financial Aid Programs

Federal College Work-Study Program

Eligible graduate students may work part time and earn money to help pay their educational expenses while attending school. On-campus and off-campus jobs are available in areas related to the student's educational interests.

Federal Direct Unsubsidized Loan

This is a non-need-based loan with a current fixed rate of 4.30%. Interest must be paid while the student is in school or must be capitalized as agreed upon by the borrower and lender. Repayment of the principal and any capitalized interest begins when the student's enrollment status drops below half time. The maximum annual loan amount is $20,500.

Federal Direct PLUS Loan for Graduate and Professional Students

This is a non-need-based loan with a current fixed rate of 5.30%. Annual loan limits are the cost of living minus other aid.

Student and Faculty Educational Opportunities

Research participation and science education programs administered by Oak Ridge Institute for Science and Education (ORISE).

UAB Financial Information

UAB Graduate Family Assistance Scholarship
Scholarship funds will be provided to graduate students who have family-related financial commitments that would, if not resolved, prevent them from enrolling in a degree-granting graduate program. **ONLY INCOMING STUDENTS WHO ARE ALREADY ACCEPTED INTO A RESEARCH BASED DOCTORAL PROGRAM ARE ELIGIBLE TO APPLY.**

Comprehensive Minority Faculty and Student Development Program (CMFSDP) Fellowships

Graduate Fellowships are available to qualified African American students, newly enrolled at UAB and seeking to earn a Ph.D. degree.

License to Learn Scholarship
UAB National Alumni Society License To Learn Scholarships are designed to provide additional financial aid to currently enrolled, undergraduate and graduate level UAB students.

Joseph F. Volker Alumni Scholarship
In an effort to recognize the accomplishments of currently enrolled UAB students, the UAB National Alumni Society established a scholarship award program named in honor of the late Dr. Joseph F. Volker.

Distinguished Alumni Scholarship
Distinguished Alumni Scholarship The Student Relations Committee established a new scholarship endowment in 1994 to honor the Society's Distinguished Alumni Award recipients.

Dr. Charles A. McCallum International Scholarship
This scholarship is awarded annually to recognize UAB National Alumni Society international chapters located in Thailand and Taiwan, and to honor Dr. Charles "Scotty" McCallum, UAB president emeritus, who helped to establish these two chapters.

BBVA Compass Mortgage Graduate Student Scholarship
For graduate students.

Other Sources of Financial Aid

Funding Links

Revised PHS 398 and PHS 2590 Forms
Community of Science
Candid - The Foundation Center
National Science Foundation
NSF Graduate Research Fellowship Program
GrantsNet
ScienceCareers
Academic Position Network
Employment Resources from the Alabama Department of Rehabilitation
Guidance on job searching and lists of available state jobs

Academic Common Market

The Academic Common Market is an interstate agreement among selected southern states for sharing academic programs at both the baccalaureate and graduate levels. Participating states are able to make arrangements for their residents who qualify for admission to enroll in specific programs in other states on an in-state tuition basis. Participating states are Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

If you are not an Alabama resident and you wish to enroll at UAB as an Academic Common Market student, you must be accepted for admission into a UAB program to which your state has obtained access for its residents through the Academic Common Market coordinator in your home state.

Certification of eligibility must be received by the Graduate School before the first day of class in the initial semester of registration to obtain in-state tuition status for the entire program; otherwise, in-state tuition status will be awarded beginning with the semester following receipt of this certification. Please note that if a student who enrolls at UAB as an Academic Common Market student changes majors, the student will revert to paying out-of state tuition.

To obtain the name and address of a state coordinator, visit the Academic Common Market web site (www.sreb.org/page/1304/).

Graduate Assistantships and Traineeships (Fellowships)

Graduate Assistants and Trainees are obligated at all times to maintain high ethical standards in academic and non-academic activities, and to report violations of these standards to the faculty mentor and/or program director. Such students should stay well informed of departmental, school, and institutional regulations, and follow them consistently. In general, Graduate Assistants and Trainees are expected to be engaged in activities associated with their graduate programs year-round, including the periods between academic terms.

Responsibilities of Graduate Trainees

Graduate Trainees are supported by fellowship and other institutional funds that do not have a service requirement but are instead intended to allow the student to be committed full-time to their graduate studies. The fundamental responsibility of Graduate Trainees is to immerse themselves full-time in their graduate studies, carrying out those activities required by their program, including course work and any original research necessary to fulfill thesis, pre-dissertation, or dissertation requirements that the program stipulates.

Responsibilities of Graduate Assistants

In general, Graduate Assistantships (including Graduate Research Assistantships and Graduate Teaching Assistantships) provide support from research grants or other institutional funds for students engaged in activities that support the research, teaching, and service missions of the university. The fundamental responsibility of Graduate Assistants is to work closely with their faculty mentors in carrying out research, teaching, or service activities, while at the same time making good progress toward the completion of the degree program. If a student’s assistantship responsibilities and academic program are properly coordinated, these responsibilities will be compatible. The assistant and mentor should articulate their goals early in the term of appointment and work together to achieve them. If problems arise in the assistantship assignment, the Graduate Assistant should seek help first from the faculty mentor. If problems cannot be resolved, the student should consult their program director.

Qualifying for an Assistantship/ Traineeship

Students who are receiving a Graduate Assistantship or Traineeship are required to be enrolled according to the following criteria:

- at least 9 credit hours in the fall and spring terms, and
- registration for credit hours in the summer at a minimum level established by their academic School or College. Students should consult with their program director before registering for summer credit hours.

Students enrolled in programs that traditionally only offer course work and research opportunities during fall and spring terms are considered to be full-time even if they do not enroll during the summer term.

Graduate Assistant and Trainee Leave

Graduate assistants and trainees are not entitled to paid leave. Any schedule time away must be coordinated between the student and the mentor. Additional information regarding assistantships and traineeships can be found here.

Student Life

Graduate students at UAB have many opportunities to become involved in the life of the university. Information about additional groups, both on and off campus, can be found in the UAB Student Handbook, *Direction* at http://www.uab.edu/handbook/.

UAB Student Experience would like to invite you to complete your UAB experience by becoming involved in the many activities and organizations available to you as a student. Events range from relaxing at free movies or comedy shows, involvement in student governance, cheering on the Blazers, writing for the Kaleidoscope student newspaper, rappelling down a cliff, hiking the Grand Canyon and so much more. Each semester brings new events, new organizations, opportunities to make friends, get physically fit, learn, socialize, relax, and have a good time becoming a part of the Blazer community! We want you to get involved!!

This section of the catalog contains an alphabetical list of many of the activities and organizations and activities available to students.

Contact Us:

Department of Student Experience

205-934-4175
studentlife@uab.edu
Physical Address:
Hill Student Center, Suite 401
1400 University Boulevard

Student Involvement & Leadership

205-934-8020
getinvolved@uab.edu
Physical Address:
Hill Student Center, Suite 230
1400 University Boulevard

Student Multicultural & Diversity Programs

205-996-6778
diversity@uab.edu
Hill Student Center, Suite 311
1400 University Boulevard

Student Organizations

205-934-8020
bsync@uab.edu
Hill Student Center, Suite 230
1400 University Boulevard

Black Graduate Student Association

The Black Graduate Student Association (BGSA) was founded in 1993 and is dedicated to the pursuit of academic excellence and social and political awareness with respect to African-Americans at UAB.

The BGSA sponsors social events, pertinent forums dedicated to issues of interest in the African-American community at our Black Lecture Series "Meeting of the Minds," activism opportunities, and an annual conference. For detailed information about the BGSA, visit the Web site at http://www.uab.edu/bgsa/.

Graduate Student Government

UAB graduate students are represented by the Graduate Student Government (GSG), which works closely with the Graduate School and other offices of the university administration in formulating policies and meeting student needs. All graduate students are automatically members of the GSG, and the GSG Senate is composed of student representatives from the various graduate programs. The GSG provides partial funding for graduate student travel to professional meetings. The organization co-sponsors a variety of services and activities, including the Honors Convocation, Graduate Student Research Days, and Graduate Student Orientation. Information on the Graduate Student Medical Assistance Fund and travel grants may be obtained on the GSG Web site (www.uab.edu/gsg).

Three Minute Thesis

Three Minute Thesis (3MT) is an annual competition in which graduate students present their original research in an open forum. Information regarding participating in UAB's 3MT competition is available at the Graduate School Web site (https://www.uab.edu/graduate/events/3-minute-thesis).

UAB Graduate Career Awareness Trends

The UAB GCAT, previously called the Industry Roundtable, is sponsored by the UAB Graduate School. The GCAT is a student-initiated and student run informal discussion group open to all graduate students and dedicated to fostering a greater awareness of career opportunities outside academia. Its goals are to provide a forum for networking with industry representatives; establish an interface between academia and industry; introduce students to the process of making industry contacts; encourage students to comment, ask questions, and seek advice from non-academics; stimulate students to begin career development early in their educational experience; and provide information to students about career opportunities outside academe. More information regarding the GCAT can be found at http://www.uab.edu/gcat/.

Student Outreach

Student Outreach, a function of the Office of Student Conduct & Outreach, assist students who may be struggling or distressed in some way by linking them to appropriate resources on or off campus. Staff meet with students to identify sources of stress and discuss individualized options to address those factors. The ultimate goal of the office is to help students reduce their stress and increase their support in order to be as successful as possible at UAB. Student Outreach serves as part of the UAB CARE Team (Communicate, Assess, Refer, Educate) to help

develop strategies to support students experiencing academic, social, and crisis situations, including mental health concerns.

Student Outreach also coordinates Blazer Kitchen at Hill Student Center, one of the University's two on campus food pantry locations. Open to any active UAB student, the location provides access to perishable and non-perishable food, school supplies, and personal hygiene items.

Additional information is available by stopping by 303 Hill Student Center, visiting uab.edu/studentoutreach, or calling 205-975-9509.

Title IX

The University of Alabama at Birmingham Division of Student Affairs oversees the University's compliance with Title IX of the Education Amendments of 1972. The Title IX Office works with students, University administration, departments, faculty, staff, campus police, and other support services to ensure that University policies and programs foster a campus community free of sex discrimination including gender-based assault, harassment, exploitation, dating and domestic violence, stalking as well as discrimination based on sex, sexual orientation, gender identify and gender expression, and related retaliation.

For more information about Title IX, policy, procedures, reporting, protections, resources, and support, please email titleixoffice@uab.edu or visit uab.edu/titleix. Kasey M. Robinson serves as the University's Title IX Coordinator and can be reached at 405 Hill Student Center, 205-996-1340, or kaseyr@uab.edu.

Student Services & Facilities

This page contains a list of facilities and services available to UAB students. For further information on these and other facilities and activities, contact the Information Desk, located at the Hill Student Center or refer to the UAB student handbook, *Direction*, at https://www.uab.edu/students/ and on BlazerNET on the Student Resources tab.

University Recreation

UAB University Recreation (URec) provides fitness, wellness, and recreational opportunities for the UAB students, employees, community, and beyond. URec makes this possible by offering a variety of premier programs, facilities, and services, all in the heart of UAB's campus!

Campus Recreation Center

The 152,000 square foot facility covers three floors, housing a range of amenities, including four basketball/volleyball courts (one of which can host 3 badminton/pickleball courts), four racquetball courts (one of which can be converted to squash and three for walleyball), four group fitness studios, Studio V (a functional fitness area), 18,000 square feet of weight and cardio-fitness areas, an iron cave, a game room, an aquatics center with both lap and leisure components, a multi-purpose court used for indoor soccer, floor hockey, pickleball, and badminton, an indoor track, and a climbing and bouldering wall.

Active UAB students enrolled in at least 1 credit hour in a semester have access to the Campus Recreation Center, included in their tuition. Please bring your ONECard for access. Student membership is active 14 days prior to the start of a semester and remains active 14 days after a semester concludes. Summer is considered as a semester. Students not enrolled in a semester may purchase an Off Semester Student membership.

UAB URec offers a wide range of memberships for UAB Employees, Colleagues, Alumni, Retirees, and Household members. Employees receiving Educational Assistance must purchase their UAB URec membership. For more membership information, please visit our Membership website.

All UAB Employees are eligible for a One-Week Free Trial. To sign up for the Trial membership, stop by Membership Services with your ONECard.

The Pro Shop is located at Membership Services, providing essential items for your workout and post-workout needs. Additionally, the PowerZone offers fuel options before and after your workout.

URec also offers lockers for rent in 12-month or 3-month options. Lockers are limited, so if you're interested, please contact us at 205-996-5038 or visit our Member Services desk. If you prefer not to purchase a locker, we have several areas in the facility, including the locker rooms, with day-use lockers available. Just bring a lock, store your belongings while you work out, and take it with you when you leave - free of charge!

The Campus Recreation Center is located at 1501 University Boulevard, next to the Campus Green.

Intramural and Club Sports Complex

University Recreation also manages and oversees reservations for the Intramural and Club Sports Complex on the north side of campus. This complex is the home of many UAB Club Sports. Additionally, outdoor Intramural Sports, such as Softball, Outdoor Soccer, and Flag Football, take place here.

For more details on reserving any University Recreation space visit our Facilities website.

URec Programming & Amenities

Aquatics

The Aquatics Center, housed within the Campus Recreation Center, provides a place for members to swim laps and meet their leisure aquatic needs by floating through the river or taking a dip in the hot tub. Additionally, the aquatics program offers group swim lessons, private swim lessons, lifeguarding certifications, and pool parties for special events.

For details about pool party requests and other pool activities, please visit our website.

Fitness & Wellness Services

UAB University Recreation offers comprehensive Fitness & Wellness programming that includes Group Fitness, Group Fitness+, Personal Training Services, Massage Therapy, and other Special Fitness Programming.

Group Fitness

UAB URec's group fitness classes offer numerous benefits and provide an enjoyable way to achieve your fitness goals. These dynamic, 45-minute classes provide motivation, accountability, and community support—essential elements to keep you on track in your fitness journey.

Group Fitness+

UAB URec's newest program offers a specialized approach to group fitness, tailored to your goals. These classes are designed to help you get stronger and more toned, regardless of your health and fitness

objectives. Whether you want to lose weight, tone up, slim down, or enhance your fitness level, we have a class just for you.

For more details or to reserve your spot in the next Group Fitness/Group Fitness+ class, please visit our Group Fitness Website.

Personal Training

Our team of nationally certified personal trainers will coach and guide you on your health and fitness journey, helping you to tone up, get stronger, and gain confidence in the gym. They will work with you to develop a personalized health and fitness program to help you achieve your desired results.

Personal Training Programs:

- **Gym Foundations:**
  - LiftWise: is our beginner, get to know the gym program. This is a 4-session predesigned program that you'll go through with one of our personal trainers. You will get introduced to the fitness gym and equipment. Learn how to do foundational exercise movements and resistance training. We will show you how and coach you along so you feel less intimidation and more confidence in the gym setting.
  - LiftPro: is the next progression from LiftWise. This is a beginner to intermediate exerciser program. In this 8-session program you'll learn more advanced ways of using our fitness equipment. You'll expand on your exercise and movement knowledge and experience different workout and program types. You'll get all the coaching, accountability, and instruction you need from your trainer.
- **Semi-Private:**
  - Semi-Private personal training is up to 4 training clients working out with 1 personal trainer simultaneously. This service is tailored for students and members with goals centered around general fitness. It also works for clients with similar goals outside of general fitness. Clients are not required to bring their own group; instead, we will assign clients based on your availability and goals.
- **One-on-One Personal Training**
  - One-on-one personal (1:1) training is one personal trainer to one training client. This service offers the highest level of individualized fitness training and coaching. Your workout program is customized to your individual needs so you can reach your goals faster.

Our Personal Trainers also offer Fitness and Body Composition Assessments. To get started with a Personal Trainer, please visit our website.

Massage Therapy Services

Celebrate a little YOU time by scheduling yourself a massage today! Appointments are available for 60 minutes and are performed by certified massage therapists. Please allow at least 48 hours' advanced notice of your preferred appointment time.

To schedule your next appointment, please email a completed Massage Therapy Client Questionnaire to fitness@uab.edu.

Competitive Sports

The Competitive Sports program offers activities such as intramurals and club sports that involve individual and team competition, as well as other fun, competitive events.

Intramurals

All UAB students, staff, and faculty are eligible to participate in intramural sports. Faculty and staff must adhere to specific entrance policies if they are not URec members. Individuals in any team league must have their ONECard in possession to be eligible to participate.

Every team league is offered in men's, women's, and co-rec formats. Each league will have a 4-week regular season followed by a single-elimination playoff. For more information, please visit our website or contact intramurals@uab.edu.

Club Sports

A club sport is a recognized student organization established to promote interest in a sport, develop the skills of its members, and represent UAB while competing against other universities. UAB URec typically supports around 20–25 different club sports, ranging from lacrosse, spikeball, soccer, to figure skating. Don't see a club for your sport? Become the president and start a new club! For more information, please visit our website or contact clubsports@uab.edu.

Adventure Recreation

Adventure Recreation offers outdoor trips and clinics throughout the year, including kayaking, backpacking, camping, climbing, canoeing, and whitewater rafting. Also offered are belay certification and lead climbing programs. Trips and clinics, such as the Wilderness First Responder training, are open to university students, faculty/staff, alumni, and the community. Contact outdoors@uab.edu or visit our Adventure Recreation page for more information on trips, clinics, and equipment rentals.

Climbing Wall & Bouldering Wall

Located on the mezzanine level of the Campus Recreation Center, the 36-foot tall by 42-foot wide climbing wall offers 1,512 square feet of climbing. The wall's climbing surface is constructed of reinforced polymer concrete panels and imprinted to match the look and feel of natural rock. We also have a 12-foot bouldering wall for everyone to enjoy. Both are open to all URec members. The community may use the wall by private group rental.

Outdoor Equipment Rentals

Planning a trip for the weekend but missing the gear? The Outdoor Pursuits Rental Center is here to save your adventure! We offer outdoor equipment for various events, and the rental service is open to university students, faculty/staff, alumni, and the community. Whether backpacking, camping, or canoeing, the rental center has multiple rental time spans on the equipment you might need, such as sleeping bags, tents, backpacks, and cooking sets.

URec On The Go

UAB University Recreation is stepping outside of the Campus Recreation Center and heading your way with fun, active, and educational programs. URec On The Go offers a variety of free programs and events throughout the year for students and the UAB community. Your student organization, club, or department may also hire our URec On The Go team to help improve your next event! To view a list of upcoming free URec On The

Go sessions, and to visit our Custom URec On The Go options, visit our website.

Team Building

University Recreation offers many opportunities for team-building initiatives, catering toward campus groups, corporate outings, school groups, and more! Our enthusiastic and skilled facilitators will guide your group through fun activities focused on enhancing or developing vital workplace and life skills, such as teamwork, cooperation, communication, and trust. Initiatives work on developing or enhancing communication, teamwork, trust, cooperation, team building, planning, and other common workplace functions. For more information, or to request team building, visit our website.

Campus Dining

Dining on-campus gives you the advantage of never having to worry about keeping cash on hand and never losing your parking space. At UAB we have more than fifteen (15) restaurants on-campus. Just swipe your ONE Card and dine! For more information about Campus Dining, please stop by the UAB Campus Dining office located on the top floor of the Commons on the Green next to the Den, or call (205) 996-6567. You can also visit us online at https://www.uab.edu/students/dining/.

For a map of dining locations and updated hours of operation visit: www.uab.edu/students/dining/locations-hours.

Meal Plans

Your meal plan gives you the advantage of never having to worry about keeping cash on hand to eat on-campus. Just swipe your ONE Card and dine. For meal plan options and requirements visit www.uab.edu/students/dining/meal-plans.

Dining Dollars

Dining Dollars are funds that you receive from your campus dining fee. All full-time undergraduate students (those students taking twelve (12) or more credit hours on campus) will be assessed a **$225 Campus Dining Fee** during fall and spring semesters. This Dining Dollars fee is loaded onto a student's OneCard and is used as a declining balance account accepted at all on campus dining locations. Dining Dollars are not part of a student's meal plan.

Libraries

UAB Libraries hold more than two million volumes and provide access to thousands of relevant digital resources for information, instruction, and research in support of UAB's vast academic and medical enterprise. The UAB Libraries system comprises Mervyn H. Sterne Library as well as Lister Hill Library of the Health Sciences, which includes Lister Hill Library at University Hospital and UAB Historical Collections' Reynolds-Finley Historical Library, UAB Archives, and the Alabama Museum of the Health Sciences. The faculty and staff of UAB Libraries provide the resources and essential expertise to support excellence in education, research, patient care, and community outreach. Priorities for UAB Libraries include increased access to resources, seamless cloud-based single search capability, campus-wide digital asset management, and increased support for distance and international students and researchers.

Mervyn H. Sterne Library

The **Mervyn H. Sterne Library** houses a collection of more than one million items and numerous electronic resources that support teaching and research in the arts and humanities, business, education, engineering, natural sciences and mathematics, and social and behavioral sciences. The library is located at 917 13th Street South and online at https://library.uab.edu/locations/sterne. The website is the gateway to all library services and collections including the Undergraduate Research Toolkit, subject- and course-specific Library Guides, and a list of FAQs. Services include research assistance, citation consultations, workshops and faculty-requested classes, assistance with locating materials, and interlibrary loan.

Named in memory of the late Birmingham philanthropist and civic leader Mervyn H. Sterne shortly after it opened in 1973, the library has seminar rooms, study rooms, lockable study carrels, computers, printers, scanners, copiers, and seating for 1,350 users. The first floor of the library was renovated in 2010 to make it even more user-friendly and houses the University Writing Center and a Starbucks. Due to student requests, Sterne Library has extended hours, opening 24 hours a day for five days a week except during holidays and summer terms. For more information on resources and services, visit the Sterne Library website at https://library.uab.edu/locations/sterne, call General Inquiries at (205) 934-6364 or request help by email, text, or chat at here.

Lister Hill Library of the Health Sciences

The **Lister Hill Library of the Health Sciences**, the largest biomedical library in the state, provides services and resources for UAB students, research and teaching faculty, and clinicians in medicine, nursing, optometry, dentistry, public health, health professions, and joint health sciences. The library was established in 1945, and then dedicated in 1971 in honor of Senator Joseph Lister Hill, a champion for health care and library legislation.

Lister Hill Library, located at 1700 University Boulevard, provides collaborative and group study space on the first floor and quiet study space on the second floor. Lister Hill Library's website at www.uab.edu/lister provides 24/7 access to databases, electronic journals, ebooks, LHL Guides, FAQs, and recorded classes and tutorials. Services include consultations for conducting searches, guidance for citing resources, assistance with locating materials, and interlibrary loan services. For more information on resources and services, visit the Lister Hill Library website at www.uab.edu/lister, call (205) 934-2230, or request help by email, text, or chat at www.uab.edu/lister/ask.

The **Lister Hill Library at University Hospital**, located in the West Pavilion, provides onsite support for education, research, and patient care. Access the resources and services for clinicians through the LHL@UH website at www.uab.edu/lhluh or call (205) 934-2275 for more information.

The **UAB Historical Collections**, located on the third floor of Lister Hill Library, includes the **Reynolds-Finley Historical Library**, **UAB Archives**, and the **Alabama Museum of the Health Sciences**. The Reynolds-Finley Historical Library contains rare books, pamphlets, and manuscripts in the history of medicine, science, and health-related fields. This collection dates from the mid-14th century to the early 20th century and includes a core of world-renowned medical classics with important concentrations on medicine in the Civil War, the South, and early Americana. UAB Archives is the official repository for the permanent records of the University and for archival collections held by UAB. One collecting area for manuscripts is the history of the health sciences, but

the repository preserves collections with a wide variety of topics. The Alabama Museum of the Health Sciences preserves over seven hundred years of medical history with instruments, specimens, equipment, and pharmacology used by health care professionals throughout the world, with a special emphasis on material used on and around the University of Alabama at Birmingham campuses. Please call (205) 934-4475 for more information on the Reynolds-Finley Historical Library or the Alabama Museum of the Health Sciences. Call (205) 934-1896 for more information on UAB Archives.

The UAB Bookstore

The UAB Bookstore is located at 1400 University Boulevard inside the new Hill Student Center. The bookstore posts official lists of UAB courses and stocks the textbooks and all other items necessary for successful UAB coursework. Most textbooks can be purchased new or used. The option to rent textbooks is also available for most courses. The bookstore carries study aids, reference materials, school and office supplies; medical instruments, lab coats, and scrubs; and the largest assortment of UAB logo apparel and gifts available. Contact the UAB Bookstore at (205) 996-2665 or visit the store online at www.shopuab.com

University Writing Center

Located on the first floor of Mervyn Sterne Library, the University Writing Center (UWC) is UAB students' go-to place for writing assistance, whether the task at hand is a Freshman Composition paper, a lab report, or a graduate school application essay. In a friendly and professional one-on-one setting, UWC tutors teach students to use writing to discover, apply, and communicate knowledge in all disciplines. Students commonly visit to get help with understanding a writing assignment; brainstorming ideas; developing outlines and claims; understanding and applying instructor feedback; and revising and editing complete drafts. While UWC tutors do not edit *for* students, they can help students identify their common errors and develop stronger editing processes.

In addition to one-on-one sessions in the Sterne Library location, the UWC offers online consultations for students enrolled in online courses; Ask-a-Tutor, an email service for short writing questions; and regular workshops on topics of common interest. To make an appointment, visit the UWC's website and log onto the online scheduling system with your Blazer ID and password. Like the UWC's Facebook page and follow the UWC's Twitter page to stay in touch and find out about upcoming workshops.

One Stop

What if you could get answers to your questions about your student account, financial aid and registration all in one place?
Stop running from office to office and make the One Stop your first and possibly your only stop! If we can't help you on the spot, we'll do the leg-work for you or connect you to the appropriate resource.

Contact us by email, phone, or in person.
One Stop Student Services, Room 103 of the Hill Student Center, 1400 University Blvd
onestop@uab.edu
(205) 934-4300
855-UAB-1STP (822-1787)
8:00 am - 5:00 pm, Monday - Thursday
9:00 am - 5:00 pm, Friday

Information Center

Information regarding programs, services, and activities at UAB is available at the UAB Information Center. Referrals to the appropriate department, office, or person may be made for more specific information. The Information Center is located just inside the 14th Street entrance of the Hill Student Center, 1400 University Blvd.

For additional information, call (205) 934-8000, or see the Web page at https://www.uab.edu/studentaffairs/studentcenter/

UAB Career Center

The UAB Career Center, in the Division of Student Services, assists undergraduate and graduate students in selecting appropriate fields of study, furthering their education, learning effective job searching strategies, and making connections with employers.

Career Consultants and Peer Career Advisors are available to meet one-on-one with students to explore career or educational options, revise résumés and cover letters, hone interviewing techniques, conduct searches for internships and full-time jobs, and ready themselves for interviews with employers.

The UAB Career Center is now providing UAB students with the opportunity to enhance career readiness through Canvas modules focused on key career components and resources. These modules can be completed as a series or individually. The modules are designed to walk you through various aspects and tasks to ensure you are ready for your career journey.

In addition, students may utilize Handshake, UAB Career Center's career management platform to do the following:

- Search and apply for internships
- Search and apply for full-time jobs
- RSVP for events
- Sign-up for Interviews
- Upload resumes cover letters and more
- Connect with Students
- Make Appointments with Career Consultants
- Explore Resources

The mission of the UAB Career Center to engage and empower members of the UAB community through meaningful career and experiential learning opportunities, to revolutionize the future of work. Over 25,000 employers use the UAB Career Center to connect with students. The UAB Career Center hosts a number of events throughout the year to further connect students and employers, including career fairs, employer meet-ups, and on-campus interviews.

Location
Hill Student Center, Suite 307
1400 University Boulevard

Contact
Website: https://www.uab.edu/students/cpd/
Office Number: 205.934.4324
Office Email: careercenter@uab.edu
Facebook: https://www.facebook.com/uabcareercenter
Instagram: https://www.instagram.com/uabcareercenter/?hl=en
Youtube: UAB Career Center Playlist

Disability Support Services

Disability Support Services (DSS), located in the Hill Student Center, serves as the central campus resource for students with disabilities. The goal of DSS is to provide a physically and educationally accessible university environment that ensures an individual is viewed on the basis of ability, not disability. DSS staff members work individually with students to determine appropriate accommodations. To be eligible for services, students need to complete an application, submit documentation of their disability and meet with a DSS staff member.

For more information, contact Disability Support Services at (205) 934-4205 (voice) or 934-4248 (TTY) or http://www.uab.edu/students/disability/ E-mail contacts are welcome at dss@uab.edu.

Physical Address
Hill Student Center
1400 University Boulevard

Mailing Address
UAB One Stop
1400 University Blvd., Hill 103
Birmingham, AL 35294

Office of Education Abroad

Contact Education Abroad

Mission

The mission of the UAB Office of Education Abroad (UABEA) is to administer, establish, and send UAB students on high-quality education abroad opportunities to prepare them for success in the globalized world.

Education Abroad

The Office of Education Abroad is a member of the Forum for Education Abroad (Forum), Institute of International Education, and Association of International Educators (NAFSA). The Office of Education Abroad strives to meet the Forum's Standards of Good Practice for Education Abroad, 6th Edition and Code of Ethics.

UAB Education Abroad administers, establishes, and sends UAB students on high-quality education abroad opportunities to prepare them for success in the globalized world.

Pursuant to our mission, UABEA engages in the activities described below.

- **Study Abroad**: Take courses for which academic credit is received and transferred to UAB on our supported study abroad programs. This includes academic credit for student exchanges, UAB affiliate programs, and faculty-led programs that feature traditional classes, research, service learning, internships, volunteerism, shadowing, clinical rotation, and observations.
- **International Internships, Research & Service-Learning**: Take courses for which academic credit is received and transferred to UAB on our supported study abroad programs. These opportunities are designed to enhance your resume with hands-on experiential learning abroad and offer credit-bearing outcomes.
- **Virtual/COIL Experiences**: UAB students may participate in a variety of virtual/remote learning experiences, which vary from COIL courses, group internships, part/full time internships, and remote academic courses. Explore these opportunities to immerse yourself in a virtual remote experience while earning academic credit at UAB.
- **Student Organizations Abroad**: Travel abroad as part of a UAB student organization; including Outreach Abroad, Outdoor Pursuits, artistic performances, athletic activities, or other student organization travel. Our office can help students register travel with the university, obtain the necessary education abroad insurance, and prepare for travel.
- **Student Conference Travel Abroad**: Present at or attend a conference that takes place abroad as a UAB representative. Our office can help students register travel with the university, obtain the necessary education abroad insurance, and prepare for travel.
- **Passport Office**: Apply for a passport conveniently on campus. As an official U.S. Department of State Passport Acceptance Facility, we are happy to accept passport applications for students, employees, and members of the community. Our passport service is open to the public.

Eligibility

To be eligible to apply for our programs, one must:

1. be an enrolled UAB student;
2. be 18 years of age or older (or have parental permission); and
3. be in good academic, disciplinary, and financial standing with UAB.

Some programs have additional eligibility requirements, such as GPA minima, listed on the individual program webpages.

Students may petition to the Director of Education Abroad for a possible exception to the eligibility criteria.

Grade Posting

All grades earned while abroad will be posted to the student's UAB transcript and included in GPA calculations. Letter grades are used rather than pass/fail marks. In all cases, students must participate fully in all course activities and meet all stated course requirements. Auditing of any course abroad is not permitted. The process of grade posting varies depending on the program type:

UAB Exchanges

Students earn direct UAB course credit. Courses taken on student exchanges will begin with IN ("International" indicating that the course took place at an international UAB exchange location) and a two-letter subject code such as ME (Mechanical Engineering), GN (German), SP (Spanish), etc. to indicate the subject that was studied. Additionally, each of the courses are numbered. All courses are variable in the number of credit hours students can receive based upon their enrollment at the host university. INxx courses are repeatable. INxx courses include:

Subject	Description
INAB	Study Abroad Arabic
INAH	Study Abroad Art History
INAN	Study Abroad Anthropology
INAR	Study Abroad Art Studio
INAT	Study Abroad Astronomy
INBE	Study Abroad Biomedical Engineering
INBU	Study Abroad Business
INBY	Study Abroad Biology
INCH	Study Abroad Chinese

INCM	Study Abroad Communication Studies
INCS	Study Abroad Computer & Information Science
INCY	Study Abroad Chemistry
INDC	Study Abroad Digital Community
INEC	Study Abroad Economics
INED	Study Abroad Education
INEE	Study Abroad Electrical Engineering
INEH	Study Abroad English
INES	Study Abroad Earth Science
INEV	Study Abroad Environmental Science
INFN	Study Abroad Finance
INFR	Study Abroad French
INGN	Study Abroad German
INHY	Study Abroad History
INIS	Study Abroad International Studies
INIT	Study Abroad Italian
INJP	Study Abroad Japanese
INJS	Study Abroad Justice Sciences
INMA	Study Abroad Mathematics
INME	Study Abroad Mechanical Engineering
INMG	Study Abroad Management
INMK	Study Abroad Marketing
INMU	Study Abroad Music
INPC	Study Abroad Physics
INPE	Study Abroad Physical Education
INPH	Study Abroad Philosophy
INPS	Study Abroad Political Science
INPY	Study Abroad Psychology
INSC	Study Abroad Sociology
INSP	Study Abroad Spanish
INTH	Study Abroad Theatre
INTL	Study Abroad Special Topics

For all other programs, visit UAB Education Abroad's website for details.

Residency

Courses taken on UAB Exchanges, USAC programs, ISA programs, CISAbroad programs, U.S. - UK Fulbright Commission Summer Institutes, U.S. Department of State Critical Language Scholarship Program, Clinton Scholarship at the American University in Dubai, UAB Faculty-Led Programs, and UAB Internship/Practicum Courses Abroad will satisfy the UAB residency requirement. Students must contact UABEA to ensure their Graduation Planning System records are noted accordingly.

Changes of Grades

Requests for grade changes to UABEA must be accompanied by official documentation sent directly from the host university.

International Student and Scholar Services

ISSS provides immigration compliance expertise and cultural events for international students on F-1 and J-1 visas. Specifically, we issue and extend federal immigration documents (Forms I-20 and DS-2019), help students apply for CPT and OPT work authorization, issue letters necessary to obtain Social Security cards and driver licenses, offer assistance filing taxes, and hold annual events such as Coffee Hour, International Barbecue, International Thanksgiving, and global holiday celebrations. Our vision is to provide cutting-edge immigration advising and programming to UAB and its international community, preserving the integrity of our programs while advocating for the unique needs of international students and scholars, leading to enriched educational and research opportunities, broadened cultural perspectives, and ease of adjustment to life in the US. ISSS shares space with INTO UAB on the second floor of Mervyn H. Sterne Library, located on the corner of 9th Avenue and 13th Street South. Drop by the Welcome Desk any time between 8:00 AM and 5:00 PM, or book an appointment online at https://www.uab.edu/global/students/international-students/book-an-appointment.

For additional information, visit https://www.uab.edu/global/students/international-students/current-students.

ONE Card

The UAB ONE Card serves as the official student ID and offers access to a variety of services and resources on and around campus. Students use their ONE Card to enter residence halls and the Campus Recreation Center, attend UAB athletic and cultural events and check out materials from UAB libraries. With their ONE Card, students can enjoy discounts on tickets to a wide variety of on and off-campus events through the UAB Ticket Office. The ONE Card also functions as a debit card, allowing students a convenient and secure way to pay for goods and services at a variety of on campus and local area merchant locations.

General information about the UAB ONE Card, including a list of carding locations, is available at www.uab.edu/onecard.

Questions about ONE Card services can be directed to onestop@uab.edu or (205) 934-4300.

Note: A photo ID is required to have your initial ONE Card made.

The University of Alabama at Birmingham is located in the central business district of Birmingham offering multiple transportation options. On-campus and nearby housing make walking, bicycling, and on-campus transit convenient. Public transit, private transportation providers, and personal automobiles make longer trips accessible. Regional and national transportation options help expand connections to much of the world and planned innovative transportation projects are increasingly making it easier to get to, from, and around UAB regardless of your travel preferences.

On-Campus Transportation

Walking and Bicycling

With a relatively flat, compact campus, many popular destinations are convenient to UAB and most trips to and from classes will be made on foot. In the United States, the average pedestrian commute is one-mile with the average bicycle commute approximately three miles. The UAB campus footprint is about 1.5 miles wide. UAB Housing and Residence Life and Off-Campus Student Services are able to assist students in

identifying nearby on- and off-campus housing options. Apps such as Rave Guardian and other services below help make walking and bicycling easier and safer. Students and employees wishing to register their bicycle for free will also receive a bicycle helmet and u-lock.

Blazer Express

Blazer Express provides transit service throughout the University campus. With a valid UAB One Card, students, employees, and authorized visitors can enjoy fare-free bus transportation along designated routes. Buses are ADA-accessible and can seat up to 35 riders. Bus service is provided Monday-Friday from 5:30 a.m.-12:00 a.m. Routes, stops, and real-time location of buses may be found online at through the DoubleMap smartphone app.

Blaze Ride and Safety Escort

For trips within the UAB footprint, Blaze Ride offers daytime transportation for students and employees with limited mobility, while Safety Escort provides late-night service to all students and employees. Safety Escort service is available seven days a week from 9:00 p.m.-5:30 a.m. by calling (205) 934-8772. Access to Blaze Ride is limited to students gaining eligibility through Disability Support Services and employees registering with the AWARE Program. Blaze Ride is available from 7:30 a.m.-7:30 p.m. by calling (205) 975-7433. Rides for both services may also be requested through the TapRide smartphone app.

Public Transit and Other Providers

Public transit is provided by MAX Transit, Birmingham On-Demand, and CommuteSmart. Other transportation providers include micromobility, ride-hailing and carpool ride-matching apps, while future transportation innovations such as bus-rapid transit are planned to launch.

MAX Transit

Local public bus service is provided by MAX Transit. Discounted passes are available from the UAB One Stop with over thirty bus routes serving the metro Birmingham area. Real-time bus tracking is available from myStop Mobile app with trip planning available from most major mapping apps.

Birmingham On-Demand

The City of Birmingham has partnered with Via to provide the shuttle van service, Birmingham On-Demand. These trips are similar to other ride-hailing apps except using branded vans, paid drivers and with lower-priced trip costs and a more limited service area.

CommuteSmart

CommuteSmart, a program of the Regional Planning Commission, provides a subsidy for vanpooling and incentives to anyone choosing to walk, bicycle, take the bus, carpool, or work from home. Carpool participants can receive online ride-matching and all participants must log their commutes to receive incentives. Visit CommuteSmart for more information about vanpooling, ride-matching, and incentives.

Micromobility (Bicycle & Scooter Sharing)

Shared electric bicycles and scooters, known as micromobility, are provided by multiple vendors for on- and off-campus trips. These vehicles are best for short trips and may be rented through smartphone apps. Users should familiarize themselves on where they are permitted and how to safely operate them around UAB. Information on using the shared micromobility vehicles is available through the UAB Transportation website, which includes a tool to report their unsafe usage or improper parking.

Regional/National Transportation

The City of Birmingham is served by the Birmingham-Shuttlesworth International Airport (BHM) with direct and indirect flights connecting to most domestic and international destinations. Ride-hailing and taxi apps are available for transportation to and from BHM. Groome Transportation offers airport shuttle service picking up at Blazer Hall and dropping off at Hartsfield-Jackson Atlanta International Airport (ATL). Other regional transportation providers include Amtrak train service and bus service from Greyhound and Megabus, all accessible from the Birmingham Intermodal Facility.

Other Providers and Upcoming Innovative Options

Innovative transportation options are consistently launching in the city. Ride-hailing and similar taxi services operate in and around the Birmingham area. Bus Rapid Transit (BRT) is due to launch in 2022 under the name, Birmingham Xpress. BRT offers the comfort of light rail train service at a lower cost. Partially running on dedicated lanes with signal priority, BRT is expected to make traveling across the city faster and more efficient.

Parking

For those choosing to bring a vehicle, a permit is required to access student parking. Permits are purchased through the UAB Transportation website with a limited number available each semester. Incoming students may purchase permits as soon as they have been accepted by UAB and created a Blazer ID. Students unable to purchase a permit will need to develop their own transportation arrangements from the options above or other parking providers around town. Once purchased, permits are mailed to the address provided by the student. As such, it is important to regularly update your contact information in the parking system. Parking spaces are available on a first-come, first-served basis to vehicles with the proper permit displayed. Designated spaces are offered for motorcycles, carpooling, and ADA-accessible parking. Students requiring temporary or permanent ADA accessible parking must provide state-issued documentation in the student's name. A full list of parking policies and regulations are available on our website. Please note that metered street spaces are operated and enforced by the City of Birmingham.

Motorist Assistance (MARS)

Motorist Assistance Roadside Service (MARS) is a free service available to all visitors, students, and employees parking on campus who need help with a dead battery, air in a flat tire, keys locked in a car, or empty gas tank. The service is available weekdays 7:30 a.m. - 4:30 p.m., except holidays. For help, call 205-975-6277.

UAB Transportation Contact

608 8th Street South • Telephone (205) 934-3513 • E-mail: transportation@uab.edu • Website: http://www.uab.edu/transportation/

Student Health & Wellness Center

The Student Health & Wellness Center (SHWC) provides a comprehensive and integrated program of services to meet the medical, counseling and wellness needs of UAB's undergraduate, graduate and professional students. Creating a healthy campus and promoting student wellness are essential to supporting student learning and success. The SHWC is staffed by a group of committed medical providers, counselors, nurses, clinicians, wellness promotion professionals, and support staff who embrace the opportunity to meet your wellness, medical

and counseling needs. Those services and resources are available in the state-of-the-art Student Health & Wellness Center located at 1714 9th Ave. South (LRC building), Birmingham, AL 35294-1270. Blazer Express has convenient drop-off and pick-up locations near the Student Health & Wellness Center. Patient and client parking is available at the South entrance to the building.

Health Services

Student Health Services offers comprehensive primary care services including acute and chronic care, women's health, a Registered Dietitian, mental health evaluation and treatment with an on-site psychiatrist and mental health Nurse Practitioner, immunizations, allergy immunotherapy, and treatment of minor emergencies. SHS provides COVID-19 vaccines, both Moderna and Pfizer and COVID-19 testing, symptomatic and asymptomatic, at no cost to the student. A dedicated Sports Medicine and Sexual Health Clinic and Eye Care Clinic are also available, as well as Certified Athletic Trainers located in the UAB Recreational Center. Medical Clearance/Immunizations and Insurance Department are also available to assist students.r On-site lab and x-ray services are available. After-hour's consultation is provided through provider on call coverage, 24 hours a day/7 days a week/365 days a year. To ensure convenience and access, Student Health Services operates under an open-access appointment scheduling system. Go to www.uab.edu/students/health for more information or to schedule an appointment through our patient portal. You may also call (205) 934-3580 to schedule an appointment or for general information. All currently enrolled UAB undergraduate and graduate students are eligible for services at a low to no out-of-pocket cost under the student benefit. Many carriers have agreed to waive copays for these services. A more complete listing of low to no out-of-pocket cost services and those services available, but at additional cost, can be accessed at http://www.uab.edu/students/health/health-services.

Counseling Services

Counseling Services assists in developing students' potential in physical, academic, spiritual, psychosocial, emotional, and vocational areas. Common presenting concerns include depression, anxiety, grief, relationship concerns, stress management, eating disorders, alcohol or substance abuse concerns, identity, conflict, gender transition and trauma. In addition to individual and couples counseling, services include wellness programs, group opportunities, and educational resources. Confidential counseling services are available to all currently enrolled UAB students at no cost. For more information or to schedule an appointment call (205) 934-5816 or visit http://www.uab.edu/students/counseling/.

Wellness Promotion

Wellness Promotion provides students with programs, education, and resources to promote personal wellness in the areas of interpersonal violence prevention; alcohol, tobacco, and other drug misuse prevention; and self-care. Wellness Promotion offers honest conversations, provides accurate information, and develops skill-building activities to help students navigate decisions outside the classroom that can impact their personal and academic success.

Wellness Promotion also supports the Promoters of Wellness peer health education program. Promoters of Wellness (POW) are undergraduate and graduate students who are nationally Certified Peer Educators and work as student health educators. POW peer health educators seek to positively influence the campus by providing workshops, outreach and events. They also serve as a catalyst for healthy norms within the student campus culture. Additional information about the POW program can be found at *www.uab.edu/students/wellness*

You can get involved with Wellness Promotion and become eligible to apply for a POW position by taking CHHS 426: Wellness Promotion Peer Education. This 3-credit hour course provides the national Certified Peer Educator credential, focuses on participant self-care, and teaches in depth information on topics that are relevant to college students.

Student Insurance Coverage (Mandatory and Optional)

All full time students enrolled in a degree seeking program have a mandatory requirement to have major medical health insurance to ensure coverage for hospital, emergency room, specialty physician care and diagnostic testing. For more information on the mandatory insurance coverage requirement go to the SHWC website https://www.uab.edu/students/health/insurance-waivers.

Information regarding the Student Health Insurance Plan for full-time registered undergraduate students taking a minimum of **9 credit** hours and full-time graduate students taking a minimum of **6 credit** hours can be found at https://www.uab.edu/students/health/insurance-waivers/insurance-requirement-overview. All students enrolled in a **clinical program** that has a mandatory health insurance requirement will continue to have the same requirement regardless of the number of credit hour of enrollment.

To learn more about services available through the Student Health and Wellness Center, please visit any of the following website.

Student Health Services	http://www.uab.edu/students/health/
Student Counseling Services	http://www.uab.edu/students/counseling/
Wellness Promotion	http://www.uab.edu/students/wellness/

You can also contact us at one of the following phone numbers for assistance.

Call **Health Services** at (205) 934-3580 or schedule/cancel an appointment through the patient portal.

Call **Counseling Services** at (205) 934-5816 for questions or to schedule an appointment. Appointments can be canceled through the patient portal. Appointments cannot be scheduled through the patient portal.

Call **Wellness Promotion** at (205) 996-0834 for appointments. *Office hours vary for this department*.

Office Hours

Day	Hours
Monday - Friday	8:00 a.m.- 5:00 p.m.

UAB Testing Services

UAB Testing Services provides testing services for UAB students, prospective students, and the community at large. Assessments include, but are not limited to, MAT, LSAT, PRAXIS, DSST, and CLEP. For more information, visit www.uab.edu/testing.

UAB Ticket Office

The UAB Ticket Office is an excellent source for discounted tickets to local and regional attractions along with on-campus events. Discounted tickets are available for AMC and Regal Cinemas, and to most major theme parks across the southeast, Georgia Aquarium, Birmingham Zoo and McWane Science Center. Additional perks can be found at TicketsAtWork.com with the discount code **UABTICKETS** for cooperating attractions. First-class postage stamps are also available for purchase.

For additional information, contact the UAB Ticket Office, located inside One Stop Student Services in Room 103 of the Hill Student Center, 1400 University Blvd., Birmingham, AL 35294-1150 Telephone: (205) 934-8001.

Visit our website: https://www.uab.edu/one-stop/student-resources/ticket-office.

Veterans Services

UAB Veterans Services (UAB-VS) assists veterans, reservists, guardsmen, and dependents of disabled or deceased veterans to access their educational benefits. UAB-VS serves as a liaison between the student and the local and federal agencies, including the State Department of Education, Department of Defense, and the Department of Veterans Affairs. The office staff assist students in applying for educational benefits, securing tutorial assistance and obtaining veterans work-study positions. For further information, contact UAB Veterans Services, Hill Student Center, Room 313, 1400 University Blvd., Telephone (205) 996-0404 or read about our programs and services at www.uab.edu/students/veterans

VA Complaint Policy

Any VA Complaint against the school should be routed through the VA GI Bill® Feedback System by going to the following link: http://www.benefits.va.gov/GIBILL/Feedback.asp. The VA will then follow up through the appropriate channels to investigate the complaint and resolve it satisfactorily.

Choice Act

The University of Alabama at Birmingham in the State of Alabama complies with section 702 - Tuition under Veteran's Access Choice and Accountability Act of 2015, providing for resident (in-state) tuition and fees for the following:

- A Veteran using educational assistance under either chapter 30 (Montgomery GI Bill® – Active Duty Program) or chapter 33 (Post 9/11 GI Bill®), of title 38, United States Code, who lives in the State of Alabama while attending a school located in the State of Alabama (regardless of his/her formal State of residence) and enrolls in the school within three years of discharge from a period of active duty service;
- Anyone using transferred Post – 9/11 GI Bill® benefits (38 U.S.C. § 3319) who lives in the State of Alabama while attending a school located in the State of Alabama (regardless of his/her formal State of residence) and enrolls in the school within three years of the transferor's discharge from a period of active duty service;
- A spouse or child using benefits under the Marine Gunnery Sergeant John David Fry Scholarship (38 U.S.C. § 3311 (b) (9) who lives in the State of Alabama while attending a school located in the State of Alabama (regardless of his/her formal State of residence) and enrolls in the school within three years of the Service member's death in the line of duty following a period of active duty service.
- Anyone described above while he or she remains continuously enrolled (other than during regularly scheduled breaks between courses, semesters, or terms) at the same school. The person so described must have enrolled in the school prior to the expiration of the three-year period following discharge or death described above and must be using educational benefits under either chapter 30 or chapter 33, of title 38, United States code.

Veteran Student Resident Tuition Rates

The University of Alabama at Birmingham complies with veteran student regulations regarding tuition rates. The following individuals shall be charged a rate of tuition not to exceed the in-state rate for tuition and fees purposes:

• A Veteran using educational assistance under either chapter 30 (Montgomery GI Bill® – Active Duty Program) or chapter 33 (Post-9/11 GI Bill®), of title 38, United States Code, who lives in Alabama while attending a school located in Alabama (regardless of his/her formal State of residence) and enrolls in the school within three years of discharge or release from a period of active duty service of 90 days or more.

• Anyone using transferred Post-9/11 GI Bill® benefits (38 U.S.C. § 3319) who lives in Alabama while attending a school located in Alabama (regardless of his/her formal State of residence) and enrolls in the school within three years of the transferor's discharge or release from a period of active duty service of 90 days or more.

• Anyone described above while he or she remains continuously enrolled (other than during regularly scheduled breaks between courses, semesters, or terms) at the same school. The person so described must have enrolled in the school prior to the expiration of the three year period following discharge or release as described above and must be using educational benefits under either chapter 30 or chapter 33, of title 38, United States Code.

• Anyone using benefits under the Marine Gunnery Sergeant John David Fry Scholarship (38 U.S.C. § 3311(b)(9)) who lives in Alabama while attending a school located in Alabama (regardless of his/her formal State of residence).

• Anyone using transferred Post-9/11 GI Bill® benefits (38 U.S.C. § 3319) who lives in Alabama while attending a school located in Alabama (regardless of his/her formal state of residence) and the transferor is a member of the uniformed service who is serving on active duty.

• Anyone using educational assistance under chapter 31, Vocational Rehabilitation/Employment (VR&E), also be charged the resident rate. Effective for courses and terms beginning **after March 1, 2019**, a public institution of higher learning must charge the resident rate to chapter 31 participants, as well as the other categories of individuals described above. When an institution charges these individuals more than the rate for resident students, VA is required to disapprove programs of education sponsored by VA.

• The policy shall be read to be amended as necessary to be compliant with the requirements of 38 U.S.C. 3679(c) as amended.

V.A. Education Benefits

Effective 8/1/2019 - (PL 115-407 Sec. 103)

Students utilizing VA education benefits shall not be charged a penalty, including assessment of late fees, denial of access to classes, libraries or other institutional facilities, or be required to borrow additional funds because of the individual's inability to meet their financial obligations due to the delayed disbursement of a payment to be provided by the Department of Veterans Affairs.

UAB Sustainability

UAB Sustainability understands that our future belongs to the present. We focus on sustainability and the triple bottom line theory to empower our leaders to make data-driven decisions. We partner across our institution to ensure the decisions we make now will have a positive impact on the quality of life of the UAB community for generations to come.

UAB has a special responsibility to act as a driver of sustainable solutions in our region and beyond. Our urban campus is a living laboratory, because of its:

- more than 200 classroom, office, research, and hospital buildings,
- space occupying more than 100 city blocks,
- role as one of the top employers in the region,
- role as the largest electricity user in the state, and
- responsibility as the single-biggest contributor to Birmingham’s economy

Sustainability Courses at UAB

UAB’s expanding undergraduate sustainability curriculum engages academic disciplines and multidisciplinary programs to prepare our students to become environmentally and socially responsible global citizens. Each term UAB offers courses with content related to sustainability,

Anthropology

ANTH 104 Introduction to Peace Studies (3 s.h.)

ANTH 200 Applied Anthropology

ANTH 360 Ecological Anthropology

ANTH 404 Human Rights, Peace, and Justice

ANTH 413 Peace & Environmental Sustainability

ANTH 437 Real World Remote Sensing Applications

ANTH 483 Intern in Peace, Justice and Environmental Study

ANTH 504 Foundations in Anthropology

ANTH 505 Anthropology of Peace, Justice, and Ecology

ANTH 513 Peace & Environmental Sustainability

ANTH 652 Sustainable Peace Seminar

Biology

BY 124 Introductory Biology II

BY 468 Ecological Genetics

BY 470 Ecology

BY 585 Northern Field Studies

MESC 208 Biology and Conservation of Marine Turtles

MESC 230 The Ecology of Florida Everglades

MESC 302 Coastal Zone Management

MESC 303 Coastal Climatology

MESC 330 Marine Conservation Biology

Civil, Construction, and Environmental Engineering

CE 236 Environmental Engineering

CE 431 Energy Resources

CE 537 Environmental Experimental Design and Field Sampling

CE 537L Environmental Experimental Design and Field Sampling Lab

CE 600 Sustainable Construction

CE 608 Green Building Design

CE 610 The Engineered Environment

CE 631 Environmental Law

CE 636 Stormwater Pollution Management

CE 690 Special Topics in (Area)

Sustainable Smart Cities MS Program first year courses

CESC 600 Principles of Sustainable Development

CESC 602 Introduction to Sustainable Smart Cities

CESC 604 Low-Carbon and Renewable Energy Systems for Smart Cities

CESC 606 Managing Natural Resources and Sustainable Smart Cities

CESC 608 Green Infrastructure and Transportation

CESC 610 Health and Livability

CESC 612 Green Buildings

CESC 614 Smart Cities Technologies

CESC 616 Big Data and Smart Cities

CESC 618 Research Methods and Project Planning

CESC 620 Sustainable Smart Cities Research Project

Geography

GEO 491 Environmental Policy

Political Science and Public Administration

PSC 103 Foundations of International Relations

PSC 266 The United Nations

PSC 316 Human Rights

PSC 355 Politics of Development

PSC 361 North/South International Relations

PSC 386 Economics of Public Policy

PSC 465 International Law

Chemistry

ES 101 Physical Geology

ES 102 Physical Geology Laboratory

Marketing, Industrial Distribution, and Economics

EC 308 Economics of Environment

Honors College, Science and Technology Honors Program

STH 199 Introduction to the Scientific Process

Environmental Health Sciences

ENH 615 Environmental Justice and Ethics

ENH 660 Fundamentals of Air and Water Pollution

History

HY 439 American Environmental History

Sociology

SOC 431 Environmental Sociology

SOC 470 Population Dynamics

Collat School of Business

Dean: Christopher L. Shook, Ph.D.

The Collat School of Business offers the following graduate programs:

Degree Programs

- Master of Accounting (M.Ac.)
- Master of Business Administration (M.B.A.)
- Master of Science in Management Information Systems (M.S.MIS) - Online only

Certificate Programs

- Graduate Certificate in Business Analytics
- Graduate Certificate in Cybersecurity Management
- Graduate Certificate in Information Technology
- Graduate Certificate in Social Media
- Graduate Certificate in Technology Commercialization and Entrepreneurship
- Graduate Certificate in Foundations of Business Administration

The Collat School of Business offers an engaging learning environment with classrooms extending well beyond the walls of the UAB campus. We meet the varying needs of our students by offering classes face-to-face, online, and in hybrid formats. Our unique location allows our faculty to integrate the practical experiences of the State's leading companies - from Fortune 500 corporations to entrepreneurial start-ups - into the programs we offer.

The Collat School of Business is accredited at the baccalaureate and master's level by AACSB International and holds separate AACSB International accreditation of the undergraduate and master's programs in accounting, an accomplishment held by less than 2% of business schools worldwide. AACSB International is the largest and longest standing specialized accrediting agency for business and accounting programs in the world and represents the highest standard of achievement.

Mission Statement

At Collat, we prepare students for success as leaders and professionals, in Birmingham and beyond, using a balanced approach to teaching, research and service.

Vision Statement

Collat is known for innovative programs, impactful scholarship and transformative service.

Shared Values

· **Integrity** – We act ethically and do what is right.

· **Respect** – We treat others with courtesy and civility.

· **Diversity and inclusiveness** – Everybody counts every day. We actively seek varied perspectives in our decision-making.

· **Collaboration** – We trust each other and work cooperatively across disciplinary boundaries in the spirit of shared governance.

· **Excellence and achievement** – We constantly innovate, solve problems and improve ourselves and others through learning.

· **Stewardship** – Fiscal and environmental sustainability guide our decisions.

· **Accountability** – We are answerable to each other and act with the best interests of the university in mind.

Business Analytics with Information Technology (IT) Certificate Program

Purpose

The objective of the Graduate Certificate in Business Analytics with Information Technology (IT) is to help working professionals advance in their careers by improving understanding about how analytics plays a strategic role in the modern organizational environment. The emphasis of this certificate program is on the application of IT tools for business analytics and its alignment with organizational strategy, data-driven decision-making, and the visualization of data analysis for presentation to key organizational stakeholders. Students will gain understanding of fundamental analytics concepts, the process of extracting, transforming, and loading data from a variety of sources into manageable datamarts that can be used for analysis by organizations, and the use of IT tools in the analytics field.

Eligibility

The entry requirements for the graduate certificate will be the same as the requirements to be accepted as a non-degree seeking student in the School of Business Graduate School (completed undergraduate degree with a GPA of 3.0 or higher, and/or meets the qualifications for graduate MIS admissions).

The certificate will require the successful completion of 15 credit hours (see 5 required courses below) and a cumulative grade point of average of 3.0 or better.

Business Analytics with Information Technology (IT) Certificate Program

Requirements		Hours
GPA Requirement		
A cumulative GPA of 3.0 or greater is required to successfully complete the certificate program.		
Certificate Courses		
IS 608	Desktop Analytics with IT Tools	3
or MBA 662	Quantitative Analysis for Business Managers	
IS 617	Data Science for Business	3
IS 619	Advanced Business Analytics	3
IS 651	Data Management & SQL for Analytics	3
IS 652	Data Visualization for Business	3
Total Hours		**15**

Students who have previously taken equivalent courses from a regionally accredited, AACSB institution may receive transfer credit towards the graduate certificate program with a grade of 3.0 (i.e., B) or better. Up to 6 credits may be transferred into the graduate certificate program with the approval of the program director.

Benefits

This certificate serves as a credential for students wishing to gain further depth in their knowledge, skills, and abilities within the field of business analytics. Earning a Business Analytics with IT Certificate differentiates students in a competitive hiring environment.

Cybersecurity Management Certificate Program

Purpose

The objective of the Graduate Certificate in Cybersecurity Management is to help working professionals advance in their careers by improving understanding about the field of cybersecurity and the role security plays in the modern organizational environment. The emphasis of this certificate program is on the managerial aspects of cybersecurity, including security strategy and planning, policy development, risk and vulnerability assessment and management, and managing under uncertainty during security incidents.

Eligibility

The entry requirements for the graduate certificate will be the same as the requirements to be accepted as a non-degree seeking student in the School of Business Graduate School (completed undergraduate degree with a GPA of 3.0 or higher, and/or meets the qualifications for graduate MIS admissions).

The certificate will require the successful completion of 15 credit hours (see 5 required courses below) and a cumulative grade point of average of 3.0 or better.

Cybersecurity Management Certificate Program

Requirements		Hours
GPA Requirement		
A cumulative GPA of 3.0 or greater is required to successfully complete the certificate program.		
Certificate Courses		
IS 607	Introduction to Cyber Security	3
IS 613	Information Security Management	3
IS 644	Digital Forensics	3
IS 620	Cyber Attacks and Threat Mitigation	3
IS 621	Incident Response and Business Continuity	3
Total Hours		**15**

Students who have previously taken equivalent courses from a regionally accredited, AACSB institution may receive transfer credit towards the graduate certificate program with a grade of 3.0 (i.e., B) or better. Up to 6 credits may be transferred into the graduate certificate program with the approval of the program director.

Benefits

This certificate serves as a credential for students wishing to gain further depth in their knowledge, skills, and abilities within the field of cybersecurity. Earning a Cybersecurity Management Certificate differentiates students in a competitive hiring environment.

Graduate Certificate in Digital Marketing

Graduate Certificate in Digital Marketing

Requirements		Hours
MBA 655	Digital Marketing Strategy	3
MBA 656	Integrated Marketing Communications Practicum	3
MBA 657	Digital Marketing Topics	3
MBA 653	Marketing Analysis and Decision Making	3
or MBA 617	Data Science for Business	
Elective Approved by Program Director		3
Total Hours		**15**

Information Technology (IT) Operations and Strategy Certificate Program

Purpose

The objective of the Graduate Certificate in Information Technology (IT) Operations and Strategy is to help working professionals advance in their careers by improving their understanding of the operational and strategic roles of technology in organizations today. The emphasis of this certificate program is on the managerial application of technology in business and its alignment with organizational strategy, key stakeholders, and the translation of strategy into operational activities. Students will gain an understanding of managing projects and cyber security, leveraging IT to gain competitive advantage, making data-driven decisions, and analyzing the use cases for emerging technologies.

Eligibility

The entry requirements for the graduate certificate will be the same as the requirements to be accepted as a non-degree seeking student in the School of Business Graduate School (completed undergraduate degree with a GPA of 3.0 or higher, and/or meets the qualifications for graduate MIS admissions).

The certificate will require the successful completion of 15 credit hours (see 5 required courses below) and a cumulative grade point of average of 3.0 or better.

Information Technology (IT) Management Certificate Program

Requirements		Hours
GPA Requirement		
A cumulative GPA of 3.0 or greater is required to successfully complete the certificate program.		
Certificate Courses		
IS 611	Information Technology and Business Strategy	3
IS 612	IT Governance and Management	3
IS 621	Incident Response and Business Continuity	3
IS 640	Technology Planning and Capital Budgeting	3
IS 641	Leadership in IT	3
Total Hours		**15**

Students who have previously taken equivalent courses from a regionally accredited, AACSB institution may receive transfer credit towards the graduate certificate program with a grade of 3.0 (i.e., B) or better. Up to 6

credits may be transferred into the graduate certificate program with the approval of the program director.

Benefits

This certificate serves as a credential for students wishing to gain further depth in their knowledge, skills, and abilities within the field of information technology. Earning a IT Management Certificate differentiates students in a competitive hiring environment.

Certificate in Social Media

Purpose

The purpose of the Graduate Certificate in Social Media is to help working professionals advance their knowledge and understanding of social media marketing. The emphasis of the certificate is on the application of social media tools, strategy, and analytics. Upon completion, students should have a better understanding of how social media fits into the broader context of business and marketing strategy.

Eligibility

The entry requirements for the graduate certificate will be the same as the requirements to be accepted as a non-degree seeking student in the School of Business Graduate School (completed undergraduate degree with a GPA of 3.0 or higher, and/or meets the qualifications for graduate MBA admissions).

The certificate will require the successful completion of 12 credit hours (see 5 required courses below) and a cumulative grade point of average of 3.0 or better.

Certificate in Social Media

Requirements		Hours
MBA 616	Web Analytics	3
MBA 617	Data Science for Business	3
2 Social Media related courses approved by MBA Program Director		6
Total Hours		**12**

Benefits

Students who complete the Certificate in Social Media should have an advanced knowledge of social media strategy, analytics, tools, and tactics. Earning this certificate should differentiate students among their peers.

Doug Ayers, Ph.D.	dayers@uab.edu
Mike Wittmann, Ph.D.	wittmann@uab.edu

Certificate in Technology Commercialization and Entrepreneurship

Purpose

The Graduate Certificate in Technology Entrepreneurship and Commercialization is designed for those interested in starting or working in a growth-focused, startup organization. The emphasis is on entrepreneurial thinking, identifying entrepreneurial opportunities, translating ideas into launchable business models and understanding the challenges of leading a startup organization. The program has a practical focus and utilizes current best practice in Entrepreneurship. No prior business coursework is required for this graduate certificate

Eligibility

The entry requirements for the graduate certificate will be the same as the requirements to be accepted as a non-degree seeking student in the School of Business Graduate School (completed undergraduate degree with a GPA of 3.0 or higher, and/or holds a current graduate degree.

The certificate will require the successful completion of 12 credit hours (see 4 required courses below) and a cumulative grade point of average of 3.0 or better.

Certificate in Technology Commercialization & Entrepreneurship

Requirements		Hours
MBA 673	Planning and Pitching a New Business Concept	3
MBA 681	From Idea to IPO	3
MBA 683	Leading Innovation	3
MBA 688	Special Topics in Management (Entrepreneurship focused class approved by advisor)	3
Total Hours		**12**

Benefits

This certificate serves as a credential for students wishing to gain further depth in their knowledge, skills, and abilities in the fields of innovation, entrepreneurship and the management of rapidly growing enterprises. Earning a Certificate in Technology Commercialization and Entrepreneurship prepares students to start and manage startup companies as well as to lead innovation initiatives within established organizations.

Certificate in Foundations of Business Administration

The Certificate in Foundations of Business Administration provides the fundamental tools for success in business administration. It affords students the opportunity to acquire these skills in a five course (15 credit hours) format and the ability to complete the certificate in one calendar year if taken on a part-time basis. This certificate will appeal to students who need knowledge of the basic business disciplines without the commitment of time and resources required by the MBA degree.

This program will also appeal to employers who want a graduate-level certificate learning experience to enhance the skill sets of valued employees at a reduced cost within a one-year time frame.

Requirements		Hours
Certificate Program Core Courses		**12**
MBA 601	Accounting and Finance for Managers	
MBA 631	Management and Organizations	
MBA 619	Information Technology and Business Strategy	
MBA 651	Marketing Strategy	
Certificate Program Elective Courses (select one)		**3**
MBA 662	Quantitative Analysis for Business Managers	
MBA 642	Economics for Managers	
MBA 608	Strategic Cost Analysis and Decision Making	
MBA 621	Topics in Corporate Finance	

MBA 637	Operations and Supply Chain Management
Total Hours	**15**

Accounting

Degree Offered: Master of Accounting

Degree Offered:	Master of Accounting
Director:	Thomas Vermeer
Phone:	(205) 934-2477
E-mail:	tvermeer@uab.edu
Website:	www.uab.edu/mac

The Department of Accounting and Finance (ACFN) in the Collat School of Business is proud to offer a Master of Accounting (M.Ac.) program that holds a separate accreditation by the Association of Advance Collegiate Schools of Business (AACSB), the highest honor a business school can achieve for its accounting programs.

Courses in the program are offered in the classroom primarily in an evening format, with some classes having an online option. An enhanced online with premium program (https://www.uab.edu/business/home/programs/100-online) is also available 100% online and offers a guaranteed path of progression with a tuition premium.

High-achieving UAB accounting undergraduate students interested in pursuing the M.Ac. degree should consider the UAB Fast-Track Master of Accounting Program. Details are outlined below.

Admission

The Master of Accounting (MAc) program accepts applications (**with no GMAT/GRE requirement**) three times a year with **one** of the following degree requirements:

1. A bachelor's degree in accounting from an AACSB-accredited university, received less than five years before the desired enrollment term at UAB, with at least a 3.0 overall average GPA and at least a 3.0 average GPA in all upper-division (i.e., 300 and 400 level) accounting courses **OR**
2. A bachelor's degree in accounting from an AACSB-accredited university, received at any point in time, with at least a 3.0 overall average GPA and at least a 3.0 average GPA in all upper-division (i.e., 300 and 400 level) accounting courses **and** 3+ years of professional accounting experience **OR**
3. A bachelor's degree in any discipline (besides accounting) from a U.S. regionally accredited university and completion of UAB's Accounting Bridge Certificate program (or its equivalent) with at least a 3.0 average GPA in the Accounting Bridge Certificate (or its equivalent).

If your bachelor's degree in accounting is from a non-AACSB-accredited university, please contact our MAc program team to determine whether it meets the degree requirements above. If you do not meet the GPA requirements because of unusual/special circumstances, please contact our MAc program team for consideration.

Two Letters of recommendation (with at least one being professional) are required. GMAT/GRE test scores can be voluntarily submitted in support of your application.

Additional international requirements:

- If your bachelor's degree in accounting is from a non-United States institution, two prerequisites (AC402-Introduction to Income Taxation and AC 430-Financial Accounting III) must be completed, with a 3.0 average GPA, prior to acceptance into the MAc program).
- International students from non-English speaking countries must submit English proficiency scores (TOEFL/IELTS/PTEA) that meet the Graduate School's minimum score requirements. Specific requirements can be found at: https://www.uab.edu/gradadmissions/apply/international-applicants

Application Deadlines

Fall Semester: July 1st

Spring Semester: November 1st

Summer Semester: April 1st

Required Documents

- **Application form** including 2 evaluation forms/letters of reference (with at least one being professional)
- Current resume/CV detailing work experience
- Official transcripts from all colleges and universities attended (including dual enrollment and Community Colleges) sent directly by the Registrar or responsible head of the institution to the UAB Graduate School, LHL G03, 1720 2nd Ave. S., Birmingham, AL 35294-0013. Transcripts may also be sent electronically to gradschool@uab.edu.
- GMAT score* sent directly from the testing agency. Institution code: 1CB5S61 (If voluntarily submitting)
- 500 word Statement of Purpose

International Applicants
The following additional documents are required of international applicants:

A minimum composite score of 80 with a minimum score of 20 in each section of the Test of English as a Foreign Language (TOEFL) administered by the Educational Testing Service (ETS, **www.toefl.org**) within the five-year period immediately preceding the desired term of enrollment. We will also accept an IELTS score of 6.5 in lieu of the TOEFL.

Financial Affidavit of Support

Immigration documentation if currently residing in the United States, or proof of citizenship if currently a U.S. citizen.

A transcript evaluation report prepared by Educational Credential Evaluators, Inc. (ECE,**www.ece.org**) or World Education Services (WES, **www.wes.org**)

Full Time Student Enrollment Status

To be enrolled as a full-time graduate student, a student must register for at least 9 semester hours in the fall, spring, and summer semesters. http://catalog.uab.edu/graduate/enrollment/. If a student is enrolled in

courses offered in a 7-week format, those credit hours are applied toward the 9 semester hour requirement for the entire 14-week term.

Example: If a student is enrolled in 6 credit hours in the Spring A term (first 7 weeks) and 3 credit hours in the Spring B term (second 7 weeks), the university recognizes this student to be enrolled in 9 semester hours for the entire period (14-week term), and of full time status.

Accelerated Bachelor's/Master's Program (ABM)

A successful graduate of the ABM will earn a bachelor's degree and Master of Accounting degree from the University of Alabama at Birmingham Collat School of Business in an accelerated time period compared to the independent completion of these two degrees. Students will graduate with a Bachelor degree upon completion of the Bachelor degree requirements, then graduate with a Masters' degree upon completing the requirements for the Master of Accounting.

Admissions

The Accelerated Bachelors/Master's Program is for exceptional students. The accepted student will have:

- an average GPA of 3.5 in all institutional courses
- a minimum of 60 credit hours (36 of these credit hours must have been taken at UAB)

Before applying, the student must meet with their graduate program coordinator and their undergraduate advisor to discuss program requirements; students should also meet with a financial aid/scholarship advisor to determine the impact of ABM on their scholarships and/or aid award. The student should also be advised that additional credit hours may be required for licensure as a CPA.

Upon acceptance, a detailed plan of study must be mapped out specific to each ABM student. This plan must be agreed upon by the student, their undergraduate academic advisor, and graduate program coordinator and strictly adhered to while in the ABM program to guarantee their continued participation in the ABM. Acceptance into the program takes place after a student has earned 60 credit hours of coursework. Admission is by a committee chaired by the graduate program director, consisting of the graduate program director and department program coordinator.

To maintain status in ABM, the student must:

- maintain an institutional GPA of 3.25 or higher
- receive a B (or higher) in all courses taken while still an undergraduate student
- maintain full time student status at UAB
- Accounting and Finance Department will waive the hour requirement for internship terms if the internship causes them to drop below the full time student hour requirement.

If any of these requirements is violated, the student will be withdrawn from the ABM program. If a student is withdrawn from the ABM program, they will retain credit for the courses already completed in the program.

Once the student has completed all undergraduate course requirements for graduation, their undergraduate degree will be awarded. Once the student graduates from a bachelor's degree program, they enter the Master of Accounting program and must maintain the requirements of that program. Tuition is then charged at the graduate rate.

To accelerate progress through the Master of Accounting degree, a limited number of courses (up to 12 credit hours) may be counted toward the completion of the bachelor's degree and toward the completion of the Master of Accounting degree. The selected Master of Accounting courses must be approved by the student's undergraduate academic advisor.

Graduate courses allowed for credit sharing are the following:

AC 523 External Auditing (requires approval of program director)

AC 530 Financial Accounting III (prerequisite - AC 310)

AC 557 Business Law for Accountants (requires approval of program director) AC 573 Fraud Examination (prerequisite - AC 423/523)

AC 580 Advanced Accounting (prerequisite - AC 430/530) AC 600 Accounting Research (prerequisite - AC 430/530)

Early Acceptance Program

Early Acceptance Programs are designed for academically superior high-school students. Early Acceptance Programs allow high achieving students to be admitted to the Master of Accounting (M.Ac.) program at the same time they are admitted to an undergraduate program.

Eligible students are required to maintain a 3.5 undergraduate GPA and complete the following pre-requisite courses: AC 200, AC 201, AC 300, AC 304, AC 310, AC 401, AC 402, AC 423, and AC 430.

Uniform CPA Examination

Eligibility requirements for sitting for the Uniform CPA examination vary among the states and territories. For detailed information about these requirements, please contact the National Association of State Boards of Accountancy (NASBA) at https://nasba.org/stateboards/. The state of Alabama, through its Accountancy Laws and the Alabama State Board of Public Accountancy (ASBPA), www.asbpa.alabama.gov/), requires that applicants for the Uniform CPA Examination hold a baccalaureate degree from an accredited institution and possess a total of 120 semester hours of postsecondary education, including at least 24 semester hours of accounting in specified areas at the upper-division or graduate level and 24 semester hours in business-related courses. The UAB **120-hour** undergraduate accounting program does not provide all of the classes needed for a 150 hour CPA licensure in Alabama.

Other Professional Accounting Certifications

Other examinations leading to professional certification (CMA, CIA, CFE, CISA, etc.) generally do not require academic course work beyond the baccalaureate degree. Students interested in other accounting certifications should contact any member of the accounting faculty for further information.

Master of Accounting

Requirements		Hours
Required Courses (5)		
AC 580	Advanced Accounting	3
AC 600	Financial Accounting Research	3
AC 606	Advanced Auditing and Attestation	3

AC 620	Tax Research	3
Elective Courses -Choose Six From:		**18**
AC 513	Internal Auditing [1]	
AC 514	Governmental and Not-for-Profit Accounting	
AC 523	External Auditing [1]	
AC 530	Financial Accounting III [1]	
AC 540	International Accounting: From a User's Perspective [1]	
AC 564	Accounting Internship [1]	
AC 573	Fraud Examination [1]	
AC 607	Seminar in Financial Accounting	
AC 608	Advanced Topics in Regulation	
AC 609	Professional Standards for CPAs	
AC 612	Governance and the Business Environment	
IS 607	Introduction to Cyber Security	
IS 608	Desktop Analytics with IT Tools	
IS 613	Information Security Risk Management	
IS 620	Cyber Attacks and Threat Mitigation	
IS 621	Incident Response and Business Continuity	
IS 644	Digital Forensics	
IS 611	Information Technology and Business Strategy	
IS 612	IT Governance and Management	
IS 619	Advanced Business Analytics	
IS 640	Technology Planning and Capital Budgeting	
IS 641	Leadership in IT	
IS 651	Data Management & SQL for Analytics	
IS 652	Data Visualization for Business	
LS 571	Legal Elements of Fraud Investigation	
LS 557	Business Law for Accountants	
MBA 613	Information Security Management	
MBA 617	Data Science for Business	
MBA 662	Quantitative Analysis for Business Managers	
Total Hours		**30**

[1] May be taken as graduate courses only if not previously taken as undergraduate level courses.

Courses

AC 500. Financial Accounting I. 3 Hours.
Accounting cycle, environment of financial accounting, conceptual framework of financial accounting, financial statements, time value of money, cash and receivables. Enrollment requires permission of the M.Ac. Program Director.

AC 501. Cost Accounting. 3 Hours.
Basic Theory and procedures involving cost determination, analysis, and control. Cost allocations, applications of overhead, budgeting, standard costs, job order, process and byproduct costing, spoilage, and quantitative techniques.Enrollment requires permission of M.Ac. Program Director.

AC 502. Income Taxation I. 3 Hours.
Fundamentals and basic concepts of various entities, with emphasis on federal income taxation of individuals. Enrollment requires permission of M.Ac. Program Director.

AC 504. Accounting Information Systems. 3 Hours.
Transaction processing cycles of accounting system; internal control, development, and control of information systems; emerging development of information technology. Enrollment requires permission of the M.Ac. Program Director.

AC 510. Financial Accounting II. 3 Hours.
Continuation of AC 500. Inventories, plant assets, intangible assets, current liabilities, long term debt and stockholders' equity, dilutive securities, earnings per share, and investments. Enrollment requires permission of M.Ac. Program Director.

AC 513. Internal Auditing. 3 Hours.
Theory and practice of internal auditing and application of internal auditing principles and techniques to selected audit problems. Enrollment requires permission of M.Ac. Program Director.

AC 514. Governmental and Not-for-Profit Accounting. 3 Hours.
Special features of budgetary and fund accounting as applied to municipalities, other government units, and to other non-profit entities.

AC 523. External Auditing. 3 Hours.
Study of the external audit function and the essential standards that govern audit practice. Enrollment requires permission of M.Ac. Program Director.

AC 530. Financial Accounting III. 3 Hours.
Dilutive securities, earnings per share, investments, accounting for income taxes, accounting changes and error analysis, statement of cash flows, retirement benefits, leases and selected disclosures. Enrollment requires permission of the M.Ac. Program Director.

AC 540. International Accounting: From a User's Perspective. 3 Hours.
Development of international accounting knowledge needed to make informed decisions in global business environment.

AC 564. Accounting Internship. 3 Hours.
Work experience enabling students to better integrate academic knowledge with practical applications by exposure to accounting practice and business environment.

AC 572. Information Technology Auditing. 3 Hours.
Introduction to the practice of information technology auditing. An emphasis is placed on information technology auditing standards and methodology, as well as guidance on auditing general computer controls and application controls.

AC 573. Fraud Examination. 3 Hours.
Advanced forensic accounting concepts with a primary focus on occupational fraud and abuse--its origins, perpetration, prevention, and detection.

AC 580. Advanced Accounting. 3 Hours.
Business combinations, consolidated financial statements, multinational accounting, and partnerships.
Prerequisites: AC 430 [Min Grade: B]

AC 590. Advanced Topics in Accounting. 3 Hours.
Contemporary professional accounting issues.

AC 600. Financial Accounting Research. 3 Hours.
Consideration of recent pronouncements from various authoritative bodies such as the FASB and SEC through research projects and case discussions.

AC 606. Advanced Auditing and Attestation. 3 Hours.
Development of auditing to its present statue; authoritative bodies influencing auditing; new developments. Preq: Admission to M.Ac. program or graduate standing and approval of the M.Ac. program director.

AC 607. Seminar in Financial Accounting. 3 Hours.
This course provides an integrated understanding of the financial accounting and reporting issues for companies, not-for-profit organizations, and governments, with a particular emphasis on identifying issues, analyzing facts, evaluating the accounting literature, and determining the appropriate response.
Prerequisites: AC 580 [Min Grade: B]

AC 608. Advanced Topics in Regulation. 3 Hours.
This course provides an integrated understanding of the federal taxation of individuals, entities, and property transactions. In addition, this course covers ethical and professional responsibilities in tax as well as business law concepts. A particular emphasis will be placed on identifying issues, analyzing facts, evaluating the accounting literature, and determining the appropriate response.
Prerequisites: AC 620 [Min Grade: B]

AC 609. Professional Standards for CPAs. 3 Hours.
This course provides an integrated understanding of the audit, attestation, review, compilation, and other standards followed by CPA firms during professional engagements for companies, not-for-profit organizations, and governments, with a particular emphasis on identifying issues, analyzing facts, evaluating the professional literature, and determining the appropriate response.
Prerequisites: AC 606 [Min Grade: B]

AC 612. Governance and the Business Environment. 3 Hours.
This course examines the process by which individuals inside and outside a publicly-traded or other complex organization seek to govern the organization's activities, including boards of directors, shareholders, management, independent auditors, internal risk managers, and the Securities and Exchange Commission.

AC 620. Tax Research. 3 Hours.
Basic and advanced research tools in taxation; ethics in taxation, analysis of the tax research process and selected parts of the Internal Revenue Code and Regulations; tax planning techniques. Admission to Master of Accounting program required. MBA students with an accounting undergraduate degree can take the course with the permission of the instructor.

Business Administration

Degree Offered:	Master of Business Administration (M.B.A.)
Director:	Douglas J. Ayers, PhD
Phone:	(205) 934-8855
E-mail:	dayers@uab.edu
Website:	http://www.uab.edu/mba

Master of Business Administration

The UAB MBA is designed to provide competency in management and to acquaint the student with all aspects of business activity. In order to deal effectively with increasingly complex and ambiguous problems of business and organizations, managers require training in sophisticated analytical techniques, appreciation for the behavioral facets of management, as well as an ability to anticipate and adapt to changes in an organizational environment. The program stresses critical thinking and is decision oriented, focusing on key aspects of business administration.

The MBA program is suitable not only for students with baccalaureate degrees in business but also for those who have degrees in engineering, the sciences, or liberal arts.

UAB's MBA program offers an online MBA, and an on-campus program where students may take a combination of face-to-face and online classes. Students may choose to follow either a one or two-year-plan of study to guarantee graduation with a specified time-frame, or to pursue the degree at their own pace. Students have 5 years from term of entry to complete degree requirements.

Concentrations are available in finance, management information systems, marketing, health services, business analytics and entrepreneurship. Dual Degree options available include MD/MBA, DMD/MBA, OD/MBA, MPH/MBA, MSHA/MBA, ASEM/MBA, and several additional Engineering/MBA. Applicants interested in these dual degree options are required to apply and be accepted to both degree programs.

Quantitative Requirement

Applicants are expected to have completed a pre-calculus class with a grade of "C" or better within the last five years. If an applicant does not meet this requirement, they may be admitted with the contingency of satisfying the requirement before their first term of enrollment.

More information about this can be found on the Collat School of Business website.

Grade Point Average Policy

The MBA program follows the GPA policy set forth by the Graduate School: catalog.uab.edu/graduate/academicprogress/

Admission

To obtain specific admissions requirements on how to apply to Graduate School, prospective students should visit this page:

https://www.uab.edu/business/home/admissions/graduate/mba

Application Deadlines

Fall semester - July 1st
Spring semester - November 1st
Summer semester- April 1st

**It is suggested that international applicants should apply at least 6 months in advance of the deadline in order to ensure processing of all Visa paperwork. There is no international admission in summer terms.*

Required Documents

- **Application form** including 3 letters of reference
- Current resume
- Official transcripts from all colleges and universities attended sent directly by the Registrar or responsible head of the institution to the UAB Graduate School, 1720 2nd Ave. S.,

LHL G03, Birmingham, AL 35294-0013, or electronically to gradschool@uab.edu.

- GMAT score* (optional) Students may submit a GMAT score of 480 or greater to increase their chance of acceptance.
- Kira Talent Assessment (online interviewing platform)

Additional Documents Required for International Applicants

- TOEFL IBT score of 80 with a minimum score of 20 in each section or IELTS of 6.5 with a minimum score of 6.0 in each section (international applicants only)
- General academic credentials evaluation (**ECE** or **WES** report) for international applicants is strongly recommended. Applicants without a credentialing evaluation should apply at least 6 months in advance of application deadline to allow time for in-house evaluation by the Office of International Admissions.

Non-Degree Seeking Admission

Candidates interested in non-degree seeking admission must have an undergraduate cumulative GPA of 3.0 or higher. Non-degree seeking students are limited to applying 12 hours credit earned in this status to a degree-seeking program, if admitted. The option to enter as non-degree seeking will be offered to candidates who miss the application deadline for applying to the MBA program, but who submit all materials prior to the beginning of the term and meet admission requirements, provided that there are seats available. We will require a resume, copies of transcripts, and GMAT scores along with the application. Permission of the MBA office is needed in order to register for classes as a non-degree seeking student.

Full Time Student Enrollment Status

To be enrolled as a full-time graduate student, a student must register for at least 9 semester hours in the fall, spring, and summer semesters. http://catalog.uab.edu/graduate/enrollment/. If a student is enrolled in courses offered in a 7-week format, those credit hours are applied toward the 9 semester hour requirement for the entire 14-week term.

Example: If a student is enrolled in 6 credit hours in the Spring A term (first 7 weeks) and 3 credit hours in the Spring B term (second 7 weeks), the university recognizes this student to be enrolled in 9 semester hours for the entire period (14-week term), and of full time status.

Accelerated Bachelor's to Master's Program (ABM)

Exceptional students currently enrolled in an undergraduate degree program at UAB are encouraged to apply to our Accelerated Bachelor's/Master's program (ABM). This program is open to all students who meet the criteria for admission, regardless of their major.

How it Works

To accelerate progress through a master's degree in the Masters of Business Administration, a limited number of graduate courses (up to 12 credit hours) may be counted towards both the completion of the undergraduate degree and the MBA graduate degree. While concurrent completion of both degrees is possible, it is often not the case. Students who satisfy requirements for the undergraduate degree before completion of 12 hours of MBA coursework must file for undergraduate graduation and then proceed in the MBA program as a degree-seeking graduate students paying graduate tuition.

For non-business majors, these 12 hours of MBA coursework may count as elective credit towards completion of the undergraduate degree. For business majors, approved MBA classes and their corresponding undergraduate courses approved for sharing credit are listed at the end of this section.

Admissions

The Accelerated Bachelors/Master's Program is for exceptional students. The accepted students will have:

- A minimum GPA of 3.7 in all institutional courses
- A minimum of 60 credit hours (45 of these credits must have been taken at UAB)
- Completion of a pre-calculus course with a grade of "B" or better. Students who have not completed a pre-calculus class will be required to enroll in the Graduate School of Management's free, online Math 105 equivalent course (Quantitative Analysis Review Course). This not-for-credit course contains tutorial videos and a short proficiency test. Student must pass the quiz with a 70% or above before enrolling in MBA classes.
- All ABM students must complete a graduate level internship, which will count as one of the two required electives. For students pursuing a concentration, the internship must be in the area of concentration. A student with business experience within their field of study may appeal to the MBA Director to waive the internship requirement and substitute another elective course.
- All non-business undergraduate students must successfully complete BUS 101 or BUS 102 with a grade of B or better before beginning MBA courses.

Before applying, the student must meet with their MBA graduate program advisor and their undergraduate advisor to discuss program requirements; students should also meet with financial aid/scholarship advisor to determine the impact of ABM on their scholarships and/or aid award.

Next, students must submit the MBA ABM program application including ABM form, application fee, essay, resume, and one recommendation.

Upon acceptance, a detailed plan of study must be mapped out specific to each MBA ABM student. This plan must be agreed upon by all parties (student; their undergraduate academic advisor, undergraduate program director, graduate program advisor, and graduate program director) and strictly adhered to while in the MBA ABM program to guarantee their continued participation in the MBA ABM.

Acceptance into the program happens after the student has earned 60 credit hours of coursework. Admission is by a committee chaired by the graduate program director, consisting of the graduate program director and the graduate program advisor.

Credit Sharing Policy

To accelerate progress through the MBA degree, a limited number of courses (up to 12 credit hours) may be counted as an elective towards the completion of the bachelor's degree and toward the completion of the MBA degree.

- The selected MBA courses must be approved by the student's undergraduate academic advisor, undergraduate program director, graduate program advisor, and graduate program director
- Limited to a total of 12 credit hours of coursework

Maintaining Status in ABM

To maintain status in the ABM, the student must:

- maintain a 3.25 average in undergraduate courses
- receive a grade of B or better in the MBA classes taken while still an undergraduate student
- maintain fulltime student status at UAB

If any of these requirements is violated, the student will be withdrawn from the ABM program. If a student is withdrawn from the ABM program, they will retain credit for the courses already taken in the program.

Once the undergraduate student has completed all requirements for graduation, their undergraduate degree may be awarded.

Once the student graduates from a bachelor's degree program, they enter the MBA program as a regular, degree-seeking student and must maintain the requirements of that program. Tuition is then charged at the MBA graduate rate.

Graduate Courses Allowed for Credit Sharing

**(Successful completion of MA 105 or equivalent and completion of BUS 101 or BUS 102 with a grade of B or better are required before enrolling in MBA courses.)*

The 4 classes below are typically used for elective credit by students pursuing an undergraduate major other than business:

MBA 601 Accounting and Finance for Managers

MBA 631 Management and Organizations

MBA 642 Economics for Managers

MBA 662 Quantitative Analysis for Managers

For business undergraduate majors, the following classes may be allowed to take the place of the indicated undergraduate business requirements, pending approval of undergraduate major advisor and MBA Program:

MBA 601: AC 200, AC 201 or FN 310

MBA 631: MG 302 or MG 401

MBA 662: QM 215

MBA 642: EC 210 or EC 310

MBA 608: AC 401

MBA 621: FN 410

MBA 637: MG 403

MBA 619: IS 303

MBA 634: BUS 450

MBA 651: MK 450

Early Acceptance

Early Acceptance Programs are designed for academically superior high-school students. Early Acceptance Programs allow high achieving students to be admitted to the Master of Business Administration (MBA) program at the same time they are admitted to an undergraduate program. Students who participate in Early Acceptance are waived from applying after completion of their undergraduate degree and are guaranteed admission as long as they maintain GPA requirements.

Some Early Acceptance students may choose to participate in the ABM program, while others will enter graduate school directly after completion of the undergraduate degree. Find additional information here: https://www.uab.edu/admissions/academics/early-acceptance-programs/graduate-school.

Master of Business Administration Degree Options

Master of Business Administration

Requirements		Hours
All Concentrations		
MBA 601	Accounting and Finance for Managers	3
MBA 608	Strategic Cost Analysis and Decision Making	3
MBA 619	Information Technology and Business Strategy	3
MBA 621	Topics in Corporate Finance	3
MBA 631	Management and Organizations	3
MBA 634	Strategic Management	3
MBA 637	Operations and Supply Chain Management	3
MBA 642	Economics for Managers	3
MBA 651	Marketing Strategy	3
MBA 662	Quantitative Analysis for Business Managers	3
Two Electives chosen from the following:		6
MBA Courses		
MBA 613	Information Security Management	
MBA 617	Data Science for Business	
MBA 618	Technology Based Project Management	
MBA 622	Portfolio Theory and Construction	
MBA 623	Mergers and Acquisitions	
MBA 624	Global Financial Management	
MBA 625	Real Estate Decision Analysis	
MBA 626	Credit Markets and Instruments	
MBA 627	Financial Risk Analysis and Management	
MBA 628	Valuation Seminar	
MBA 629	Short-Term Financial Management	
MBA 635	International Business Policy	
MBA 636	Human Resource Administration	
MBA 638	Managerial Communication Skills	
MBA 643	Healthcare Leadership Development	
MBA 644	Transformational Leadership and Change	
MBA 645	Game Theory in Industrial Organization	
MBA 652	Sales Management	
MBA 653	Marketing Analysis and Decision Making	
MBA 654	International Marketing	
MBA 655	Digital Marketing Strategy	
MBA 656	Integrated Marketing Communications Practicum	
MBA 658	Applied Marketing Research	
MBA 671	Health Care Marketing	
MBA 673	Planning and Pitching a New Business Concept	
MBA 676	MBA Internship	
MBA 681	From Idea to IPO	
MBA 683	Leading Innovation	

MBA 684	Special Topics in Accounting	
MBA 685	Special Topics in Finance	
MBA 686	Special Topics in Marketing	
MBA 687	Special Topics in Economics	
MBA 688	Special Topics in Management	
Total Hours		**36**

Marketing Concentration

Requirements		**Hours**
MBA Required Courses		
MBA 601	Accounting and Finance for Managers	3
MBA 608	Strategic Cost Analysis and Decision Making	3
MBA 619	Information Technology and Business Strategy	3
MBA 621	Topics in Corporate Finance	3
MBA 631	Management and Organizations	3
MBA 634	Strategic Management	3
MBA 637	Operations and Supply Chain Management	3
MBA 642	Economics for Managers	3
MBA 651	Marketing Strategy	3
MBA 662	Quantitative Analysis for Business Managers	3
Choose Three From:		**9**
MBA 652	Sales Management	
MBA 653	Marketing Analysis and Decision Making	
MBA 654	International Marketing	
MBA 655	Digital Marketing Strategy	
MBA 656	Integrated Marketing Communications Practicum	
MBA 658	Applied Marketing Research	
MBA 671	Health Care Marketing	
MBA 686	Special Topics in Marketing	
Or other Marketing course approved by advisor		
Total Hours		**39**

Health Services Concentration

Requirements		**Hours**
MBA Required Courses		
MBA 601	Accounting and Finance for Managers	3
MBA 608	Strategic Cost Analysis and Decision Making	3
MBA 619	Information Technology and Business Strategy	3
MBA 621	Topics in Corporate Finance	3
MBA 631	Management and Organizations	3
MBA 634	Strategic Management	3
MBA 637	Operations and Supply Chain Management	3
MBA 642	Economics for Managers	3
MBA 651	Marketing Strategy	3
MBA 662	Quantitative Analysis for Business Managers	3
Health Services Concentration		
MBA 671	Health Care Marketing	3
Two MBA or HPO electives at the 600 level or other health-related courses approved by advisor		6
Total Hours		**39**

Finance Concentration

Requirements		**Hours**
MBA Required Courses		
MBA 601	Accounting and Finance for Managers	3
MBA 608	Strategic Cost Analysis and Decision Making	3
MBA 619	Information Technology and Business Strategy	3
MBA 621	Topics in Corporate Finance	3
MBA 631	Management and Organizations	3
MBA 634	Strategic Management	3
MBA 637	Operations and Supply Chain Management	3
MBA 642	Economics for Managers	3
MBA 651	Marketing Strategy	3
MBA 662	Quantitative Analysis for Business Managers	3
Choose Three From:		**9**
MBA 622	Portfolio Theory and Construction	
MBA 624	Global Financial Management	
MBA 625	Real Estate Decision Analysis	
MBA 626	Credit Markets and Instruments	
MBA 627	Financial Risk Analysis and Management	
MBA 629	Short-Term Financial Management	
MBA 685	Special Topics in Finance	
Or other Finance course approved by advisor		
Total Hours		**39**

Management Information Systems Concentration

Requirements		**Hours**
MBA Required Courses		
MBA 601	Accounting and Finance for Managers	3
MBA 608	Strategic Cost Analysis and Decision Making	3
MBA 619	Information Technology and Business Strategy	3
MBA 621	Topics in Corporate Finance	3
MBA 631	Management and Organizations	3
MBA 634	Strategic Management	3
MBA 637	Operations and Supply Chain Management	3
MBA 642	Economics for Managers	3
MBA 651	Marketing Strategy	3
MBA 662	Quantitative Analysis for Business Managers	3
Choose Three From:		**9**
IS 613	Information Security Management	
IS 617	Data Science for Business	
IS 618	IT Project Management	
IS 621	Incident Response and Business Continuity	
Total Hours		**39**

Entrepreneurship Concentration

Requirements		**Hours**
MBA Required Courses		
MBA 601	Accounting and Finance for Managers	3
MBA 608	Strategic Cost Analysis and Decision Making	3
MBA 619	Information Technology and Business Strategy	3
MBA 621	Topics in Corporate Finance	3
MBA 631	Management and Organizations	3
MBA 634	Strategic Management	3
MBA 637	Operations and Supply Chain Management	3
MBA 642	Economics for Managers	3
MBA 651	Marketing Strategy	3
MBA 662	Quantitative Analysis for Business Managers	3
Choose Three From:		9
MBA 673	Planning and Pitching a New Business Concept	
MBA 681	From Idea to IPO	

MBA 683	Leading Innovation	
MBA 688	Special Topics in Management (Entrepreneurship related topic approved by advisor)	
Total Hours		**39**

Business Analytics Concentration

Requirements		Hours
MBA Required Classes		
MBA 601	Accounting and Finance for Managers	3
MBA 662	Quantitative Analysis for Business Managers	3
MBA 631	Management and Organizations	3
MBA 642	Economics for Managers	3
MBA 608	Strategic Cost Analysis and Decision Making	3
MBA 621	Topics in Corporate Finance	3
MBA 619	Information Technology and Business Strategy	3
MBA 651	Marketing Strategy	3
MBA 637	Operations and Supply Chain Management	3
MBA 634	Strategic Management	3
Choose three (3) courses from:		9
MBA 617	Data Science for Business	
IS 619	Advanced Business Analytics	
IS 651	Data Management & SQL for Analytics	
IS 652	Data Visualization for Business	
MK 536	Digital Marketing Analytics	
MBA 616	Web Analytics	
Total Hours		**39**

Dual Degree Option for M.B.A./D.M.D., M.B.A./M.P.H., M.B.A./O.D., M.B.A./A.S.E.M.

Requirements		Hours
MBA 601	Accounting and Finance for Managers	3
MBA 631	Management and Organizations	3
MBA 642	Economics for Managers	3
MBA 662	Quantitative Analysis for Business Managers	3
MBA 608	Strategic Cost Analysis and Decision Making	3
MBA 619	Information Technology and Business Strategy	3
MBA 621	Topics in Corporate Finance	3
MBA 637	Operations and Supply Chain Management	3
MBA 651	Marketing Strategy	3
MBA 634	Strategic Management	3
Total Hours		**30**

Dual Degree Option for M.B.A./M.S.H.A.

Requirements		Hours
MBA 601	Accounting and Finance for Managers	3
MBA 631	Management and Organizations	3
MBA 642	Economics for Managers	3
MBA 662	Quantitative Analysis for Business Managers	3
MBA 608	Strategic Cost Analysis and Decision Making	3
MBA 629	Short-Term Financial Management	3
or MBA 621	Topics in Corporate Finance	
MBA 637	Operations and Supply Chain Management	3
MBA 651	Marketing Strategy	3
MBA 634	Strategic Management	3
MBA 500/600 level elective		3
Total Hours		**30**

Dual Degree Option for M.B.A./M.D.

Requirements		Hours
MBA 601	Accounting and Finance for Managers	3
MBA 631	Management and Organizations	3
MBA 642	Economics for Managers	3
MBA 608	Strategic Cost Analysis and Decision Making	3
MBA 619	Information Technology and Business Strategy	3
MBA 621	Topics in Corporate Finance	3
MBA 637	Operations and Supply Chain Management	3
MBA 651	Marketing Strategy	3
MBA 634	Strategic Management	3
MBA 688	Special Topics in Management (Healthcare Innovation)	3
Total Hours		**30**

Degree with Concentration requires additional approved elective in selected area of study: 39 Total Hours (13 Courses). Concentrations are offered in Finance, Health Services, Information Systems, and Marketing.

Courses

MBA 601. Accounting and Finance for Managers. 3 Hours.
Decision oriented survey course of the principles of both financial accounting and financial management. Broad study of the basic concepts and tools of financial accounting and finance from both the theoretical and practical perspectives. Topics include financial reporting responsibilities of management, analysis and interpretation of financial statements, and the application of time value concepts to the valuation of stocks, bonds, and capital projects.

MBA 608. Strategic Cost Analysis and Decision Making. 3 Hours.
Determination and use of cost data for decision making, control, and evaluation of performance, and formulation of goals and budgets. The strategic context of managerial decision making is emphasized.
Prerequisites: MBA 601 [Min Grade: C]

MBA 613. Information Security Management. 3 Hours.
Develop an understanding of key information security concepts. Develop an understanding of how people, technology and organizational policies should be developed and managed to safeguard an organization's information resources. Learn how to manage under uncertainty and risk. Develop policies and procedures to make information systems secure. Learn how to audit and recover from security breaches.

MBA 616. Web Analytics. 3 Hours.
The Web Analytics course introduces technologies and tools used to realize the full potential of web sites. The course focuses on collection and use of web data such as web traffic and visitor information to design web sites that will enable firms to acquire, convert, and retain customers.

MBA 617. Data Science for Business. 3 Hours.
This course is an introduction to the topic of Business Intelligence with the emphasis of providing a descriptive understanding to the following major components: data warehousing, business performance management, data mining, and business intelligence implementation.

MBA 618. Technology Based Project Management. 3 Hours.
Equips students with the fundamental principles of project management required for successfully implementing IT solutions.

MBA 619. Information Technology and Business Strategy. 3 Hours.
Designed to improve students' understanding of business strategies and the technology management practices that support them, this course focuses on understanding the basic concepts and terminology of information technology and developing insight into the role of information technology in the strategy and management of organizations.

MBA 621. Topics in Corporate Finance. 3 Hours.
An advanced course in finance with emphasis on special topics such as financial planning, working capital management, leasing, hybrid financing, real options, and international capital budgeting. Case studies are used.
Prerequisites: MBA 601 [Min Grade: C]

MBA 622. Portfolio Theory and Construction. 3 Hours.
Theoretical and practical aspects of investments and portfolio management. Preq: MBA 621.

MBA 623. Mergers and Acquisitions. 3 Hours.
In-depth examination, study, and analysis of current issues and problems in selected areas of finance. Preq: MBA 621.

MBA 624. Global Financial Management. 3 Hours.
Financial analysis and decision-making in international context. All traditional areas of corporate finance explored. Preq: MBA 621.

MBA 625. Real Estate Decision Analysis. 3 Hours.
Master's level course designed to provide students with the tools and analytical framework for making real estate decisions. Preq: MBA 621.

MBA 626. Credit Markets and Instruments. 3 Hours.
Detailed coverage of the credit markets (Money and Bond markets) of the U.S. and an introduction to the international aspects of those instruments. Preq: MBA 621.

MBA 627. Financial Risk Analysis and Management. 3 Hours.
Exploration of issues in the measurement, analysis, and management of financial risk including interest rate, exchange rate, and commodity price risks. Preq: MBA 621.

MBA 628. Valuation Seminar. 3 Hours.
A blend of theory and practice to gain knowledge and skills in the valuation of businesses and interests therein. Preq: MBA 621.

MBA 629. Short-Term Financial Management. 3 Hours.
This course covers the principles of short-term financial management. Specific topics include liquidity, management of working capital, corporate cash management, and short-term investing and borrowing.
Prerequisites: MBA 621 [Min Grade: C]

MBA 631. Management and Organizations. 3 Hours.
Course focuses on both the internal organizational environment, specifically organizational behaviors, and externally, the legal, ethical, and social environment both domestically and internationally. Students will be able to identify policy issues externally from the legal, social, and ethical environment. Students will also gain an understanding of internal organizational behavior.

MBA 634. Strategic Management. 3 Hours.
The integration of management, finance, accounting, marketing, economics, production, information technology, and decision making concepts through the study of business policy and strategy. Must be in last term in the MBA program to register. Permission of advisor required.

MBA 635. International Business Policy. 3 Hours.
Problems and strategic considerations of firms engaged in international business.

MBA 636. Human Resource Administration. 3 Hours.
Critical management theory as applied to human resource problems such as employment, employee education and training, labor management, health and safety, compensation, and human resources research.

MBA 637. Operations and Supply Chain Management. 3 Hours.
Concepts and principles necessary to manage the operations and supply chain function in both service and manufacturing organizations. Topics include planning, controlling, directing, and organizing of people, facilities, and materials involved in operations and supply chain management. Global considerations also presented.

MBA 638. Managerial Communication Skills. 3 Hours.
An advanced business communications course for MBA students focusing on the verbal and nonverbal communication skills required of managers in today's business environment.

MBA 641. Macroeconomics Analysis and Decision Making. 3 Hours.
Macroeconomic analysis; modern theory of aggregate demand and supply; forecasting and link between business firm and micro environment. Preq: MBA 662.
Prerequisites: MBA 662 [Min Grade: C]

MBA 642. Economics for Managers. 3 Hours.
Enables students to understand core microeconomic and macroeconomic concepts and how economics theory can be used to direct managers in understanding economic forces and making rational global and domestic economic decisions.

MBA 643. Healthcare Leadership Development. 3 Hours.
Assesses and develops current and emerging leaders in healthcare. Increases awareness of topics and essential skills relevant to effective leadership and management. Participation in a team-based course project is required.

MBA 644. Transformational Leadership and Change. 3 Hours.
This course examines and applies team-based leadership principles; assesses and hones leadership skills in negotiation and conflict management; and challenges team-based leaders to address current and emerging issues via strategic thinking and organizational change. Participation in a team-based course project is required.
Prerequisites: MBA 643 [Min Grade: B]

MBA 645. Game Theory in Industrial Organization. 3 Hours.
Introduces students to the logic of game theory, in the context of selected topics in the theory of industrial organization. Emphasis will be on applying game-theoretic logic to generic business issues, studied as cases. Preq: MBA 642.

MBA 646. Leadership Development. 3 Hours.
The course assesses and develops leadership knowledge, skills, and abilities by presenting students with the opportunity to reflect on their leadership strengths and confront their leadership weaknesses. Throughout the course students will learn and practice the effective application of various leadership domains as required for different leadership situations (e.g., we will examine leading in the middle rank of an organization and leading in times of crisis).Participants will complete the class with a better understanding of their own individual leadership style and a personal leadership development plan.

MBA 651. Marketing Strategy. 3 Hours.
This course focuses on planning, implementing, and controlling strategic marketing activities. The objective is for students to understand the concepts and processes that guide marketing strategy decision making and to be able to apply these concepts and processes to organizations. Marketing strategy is examined in the context of uncertain competitive environments and from a global perspective.

MBA 652. Sales Management. 3 Hours.
This course focuses on the strategic role of an effective sales force in the organization's total marketing effort and business strategy. Students learn to formulate, implement, and evaluate a sales program. Topics include developing sales goals, creating a sales organizational structure, building a sales program, leading and motivating the sales force.

MBA 653. Marketing Analysis and Decision Making. 3 Hours.
Fundamentals of market-based management and the impact of marketing decisions on profitability. Core themes include customer value, customer satisfaction and marketing performance metrics. Students acquire an understanding of important marketing tools by applying them to key marketing mix decisions.

MBA 654. International Marketing. 3 Hours.
Examination of international marketing activities, including environmental issues, marketing strategy, and tactical considerations in entering foreign markets.

MBA 655. Digital Marketing Strategy. 3 Hours.
Develop the skills to build, implement, and manage an actionable and successful digital marketing strategy that aligns with business goals.

MBA 656. Integrated Marketing Communications Practicum. 3 Hours.
Students will leverage their knowledge in a marketing consulting project for a local business or organization. The integrated marketing communications practicum is offered for graduate students completing a social media marketing certificate.
Prerequisites: MBA 655 [Min Grade: C]

MBA 657. Digital Marketing Topics. 3 Hours.
Digital Marketing Topics is a lecture-based course that focuses on digital marketing topics that are both relevant and timely. Topics may include, but are not limited to, new digital marketing tools and techniques, past, present, and future of digital marketing, social media ethics, artificial intelligence, etc. Topics focused upon will be reviewed on an annual basis to ensure relevance in relation to industry.

MBA 658. Applied Marketing Research. 3 Hours.
This course covers the fundamentals of the marketing research process, including problem definition, research design, research performance, collecting, inputting and analyzing data using IBM SPSS software, interpretation of statistical results into managerial insights, and the presentation of those results to business managers.

MBA 659. Green and Gold Fund Investment Portfolio Management. 3 Hours.
The Green and Gold Fund is UAB's student-managed investment portfolio. Fund members perform actual investment portfolio management with real money. For three credit hours in MBA 659, a student must hold the position of CIO, chief economist, or portfolio manager.

MBA 662. Quantitative Analysis for Business Managers. 3 Hours.
Covers a wide range of topics in quantitative analysis for managerial decision making. The goal is to provide students with essential analytical skills needed to make better business decisions with an emphasis on proficiency using Microsoft Excel.

MBA 671. Health Care Marketing. 3 Hours.
This class is designed for master level students seeking employment in the healthcare industry. The primary objective of this course is to provide students with a comprehensive overview of the marketing fundamentals in the health care environment. This course also examines health care organizations as customers in a B2B environment.

MBA 673. Planning and Pitching a New Business Concept. 3 Hours.
The business plan is the DNA or genetic map of a technology venture. It is the foundation for the capital raise, as well as the roadmap for operational milestones. Unfortunately, most business plans focus on internal strategy rather than a comprehensive assessment of the competitive landscape. Therefore, particular attention will be paid to market research, competitive analysis, and product/market fit.

MBA 676. MBA Internship. 3 Hours.
Offers qualified graduate students the chance to gain first-hand experience in a local business while receiving academic credit.

MBA 681. From Idea to IPO. 3 Hours.
This course is specifically designed to give graduate students in business, medicine, and engineering a deeper understanding of the issues involved in determining how to take the right idea from the laboratory to the marketplace.

MBA 683. Leading Innovation. 3 Hours.
This course exposes students to the nature of innovation, how innovation occurs, barriers to innovation and how to create and sustain an environment that encourages and rewards innovation. Students will also learn how to build, manage and grow a start-up company. Areas such as lean start-up techniques will be covered along with defining mission, vision and values, hiring and staffing and building effective business processes.

MBA 684. Special Topics in Accounting. 3 Hours.
Selected topics in accounting, graduate level.

MBA 685. Special Topics in Finance. 3 Hours.
Selected topics in finance, graduate level.

MBA 686. Special Topics in Marketing. 3 Hours.
Selected graduate-level topics in marketing.

MBA 687. Special Topics in Economics. 3 Hours.
Selected graduate-level topics in economics.

MBA 688. Special Topics in Management. 3 Hours.
Selected topics in management, graduate level.

MBA 689. Special Topics in International Business. 3 Hours.
Selected international business topics.

Management Information Systems

Degree Offered:	Master of Science in Management Information Systems (MS MIS)
Director:	Sam Goh, Ph.D.
Phone:	(205) 934-8830
Email:	sgoh@uab.edu
Website:	http://misdegree.businessdegrees.uab.edu/lp-mis-short/

The UAB Collat School of Business, Master of Science in Management Information Systems (MS MIS) program focuses on the business side of information systems and how to strategically position technology to maximize value for an organization. This program provides the broad perspective needed to advance in the information systems management field, and allow students to tailor their education based on specific career goals by focusing in one of three areas: **Cyber Security Management, IT Management, or Business Analytics**. UAB's emphasis is on the managerial aspects of information systems, and although the program does provide opportunities for skill development in

the latest technologies, the goal of the program is to help those currently working in information systems related fields move into managerial positions by improving understanding of how to use the latest information technologies to benefit organizational stakeholders, such as managers, organizations, employees, customers and partners.

The Management of Information Systems field is growing at an exponential rate as organizations struggle to stay current with new and emerging technologies, such as mobile applications, social media, and business analytics. Professionals are needed that can help organizations understand the business potential of these new technologies, how to develop new applications to meet changing market dynamics, and how to secure these systems from threats. Students graduating from this program are prepared to succeed in an exciting and dynamic career field combining a solid technical information system foundation with business skills so they can immediately contribute to solving business problems, and can drill down into specific fields, such as IT management, web and mobile development or information security.

Program Details

The MS MIS program is taught completely online. Most students can complete degree requirements within 1.6 years (1 year for full-time students). Concentrations are available in Cyber Security Management, IT Management, and Business Analytics. Each concentration consists of twelve semester hours. The Collat School of Business is accredited by AACSB–The Association to Advance Collegiate Schools of Business.

Master of Science in Management Information Systems -

Concentration in Cyber Security Management

Requirements		Hours
Core Curriculum		
IS 607	Introduction to Cyber Security [1]	3
IS 608	Desktop Analytics with IT Tools	3
IS 611	Information Technology and Business Strategy	3
IS 618	IT Project Management [2]	3
IS 650	Business Intelligence Strategy	3
IS 660	Emerging IT Trends & Technologies	3
Concentration Course Requirements		
IS 620	Cyber Attacks and Threat Mitigation	3
IS 621	Incident Response and Business Continuity	3
IS 613	Information Security Management	3
IS 644	Digital Forensics	3
Total Hours		**30**

Concentration in Information Technology Management

Requirements		Hours
Core Curriculum		
IS 607	Introduction to Cyber Security [1]	3
IS 608	Desktop Analytics with IT Tools	3
IS 611	Information Technology and Business Strategy	3
IS 618	IT Project Management [2]	3
IS 650	Business Intelligence Strategy	3
IS 660	Emerging IT Trends & Technologies	3
Concentration Course Requirements		
IS 612	IT Governance and Management	3
IS 621	Incident Response and Business Continuity	3
IS 640	Technology Planning and Capital Budgeting	3
IS 641	Leadership in IT	3
Total Hours		**30**

Concentration in Business Analytics

Requirements		Hours
Core Curriculum		
IS 607	Introduction to Cyber Security [1]	3
IS 611	Information Technology and Business Strategy	3
IS 650	Business Intelligence Strategy	3
IS 660	Emerging IT Trends & Technologies	3
IS 608	Desktop Analytics with IT Tools	3
IS 618	IT Project Management [2]	3
Concentration Course Requirements		
IS 617	Data Science for Business	3
IS 619	Advanced Business Analytics	3
IS 651	Data Management & SQL for Analytics	3
IS 652	Data Visualization for Business	3
Total Hours		**30**

Students have a maximum of 3 years to complete degree requirements. Certain professional certifications are eligible for transfer credit upon Program Director approval. Students must be in current good standing and provide proof of completed continuing education requirements if certification is scheduled to expire with the calendar year. No more than 6 semester hours may be credited using certifications.

1 Security+ earned through CompTIA, or Certified Information Systems Security Professional (CISSP) earned through ISC2 may satisfy this course requirement.

2 Project Management Professional earned through PMI may satisfy this course requirement.

Courses

IS 599. Directed Readings. 1-3 Hour.
Readings and independent study in selected areas.

IS 607. Introduction to Cybersecurity. 3 Hours.
This course serves as an introduction to the field of cyber security where students will develop a basic understanding of the cyber security principles. Students will be able to understand the business value of cyber security and its legal / ethical considerations. Students will also gain an appreciation for security planning and risk management and how risk may be mitigated through technical, physical, and administrative controls.

IS 608. Desktop Analytics with IT Tools. 3 Hours.
Business decisions require the basic skills of analyzing data to understand the problem more completely and to produce better solutions. This course examines the role of IT desktop tools to support a wide variety of business problems in the field of business analytics. Students work at the operational level using business analytics desktop tools to learn foundational topics relating to analysis, statistical modeling, and decision-making in an IT-based business environment. Students will gain hands-on experience with spreadsheet modeling and practical business problems that require analysis and interpretation of data.

IS 611. Information Technology and Business Strategy. 3 Hours.
This course is designed to improve your understanding of business strategy and the information technology that supports and shapes it. Information technology spans all business functions. We will study both the challenges and the opportunities that are the result of this pervasiveness.

IS 612. IT Governance and Management. 3 Hours.
This course introduces the concept of IT governance and will expose students to various IT governance frameworks. Particular focus will be given to the IT Governance Institutes COBIT framework, ITIL and ISO standards. Students will have an advanced understanding of the various IT governance frameworks, their application in an organizational setting and the managerial issues associated with different governance structures.

IS 613. Information Security Risk Management. 3 Hours.
The primary objectives of the course are for the students to develop a managerial and operational understanding of critical information security risk management concepts. The focus of this course will be on an in-depth investigation of how risk, threats, and vulnerabilities impact information systems and work processes. The course will provide students with an opportunity to gain insights into critical security mitigation best practices.
Prerequisites: IS 607 [Min Grade: C]

IS 617. Data Science for Business. 3 Hours.
This course will introduce students to the rapidly growing fields of business analytics/ data science, focusing on how data can be used to support decision making in organizations. It explains what and how principles and technologies of data science can be used to extract useful information and knowledge from large volume of structured and unstructured data (e.g., textual content) in order to improve business decision making.
Prerequisites: IS 608 [Min Grade: C]

IS 618. IT Project Management. 3 Hours.
The course provides the foundation for the management and successful execution of projects of many types applying PMBOK, or the PMI Project Management Body of Knowledge. The objective is to provide students with an understanding of how to manage technology-oriented projects. A combination of skill development in the general area of project management and application of those skills in evaluating case studies involving technology projects will be used.

IS 619. Advanced Business Analytics. 3 Hours.
The course is the study and practice of how we can extract insightful knowledge from large amounts of data. It is a burgeoning area, currently attracting substantial demand from academy and industry.
Prerequisites: IS 617 [Min Grade: C]

IS 620. Cyber Attacks and Threat Mitigation. 3 Hours.
Covers the concepts of network vulnerabilities from a hacker's perspective. Addresses the latest cutting edge attacks and common attacks still prevalent. Students will explore legal issues associated with computer network attacks. The course also provides students with the knowledge they need to design, build, and operate network systems to prevent, detect, and respond to attacks.

IS 621. Incident Response and Business Continuity. 3 Hours.
This course provides students with the knowledge necessary to prepare for and respond to computer security incidents. Topics include incident response preparation, detection, reaction, recovery, and maintenance. Computer-related disaster recovery and business continuity planning are also addressed.

IS 640. Technology Planning and Capital Budgeting. 3 Hours.
This course will cover financial techniques and metrics that IT managers should be familiar with, including topics such as measuring returns on IT investments, categories of IT investments, defining and quantifying expected benefits, managing the IT investment portfolio, and budgeting for IT expenditures.

IS 641. Leadership in IT. 3 Hours.
The Leadership in IT course will prepare students for leadership roles in IT related careers. The course will provide students with the knowledge, skills, and foundation in Leadership necessary to be effective in organizational settings, and develop an understanding of the components that make leadership successful.

IS 644. Digital Forensics. 3 Hours.
This course focuses on how organizations conduct digital forensics investigations due to intrusion or cyber crime. This course explores how organizations identify, track, and potential aide in the prosecution of cyber criminals. Students will gain an appreciation for how to conduct digital investigations, preserve evidence, understand the role of law enforcement, and intellectual property concerns associated with cyber crime.

IS 650. Artificial Intelligence Strategy. 3 Hours.
Students taking this class will gain a managerial-level understanding of the strategic implications of Artificial Intelligence (AI) for businesses today. By weighing data-driven decision-making, addressing data quality issues, managing big data and machine learning, and deliberating ethical considerations, students will learn to deploy AI in organizations to maximize business value.

IS 651. Data Management & SQL for Analytics. 3 Hours.
Explore various concepts of data management/ data warehousing for business analytics. The focus of this course is the process of extracting data from a diverse set of sources, transforming and cleaning data, and loading this data into a format used by analytics professionals. Students will also gain expertise in advanced data querying using Structured Query Language (SQL).

IS 652. Data Visualization for Business. 3 Hours.
In this course, students gain experience with techniques on how to effectively communicate the results of an analysis using information and visual aids. Students learn effective methods of presenting information in textual and graphical formats and how to frame data results in a business case format for interpretation by business managers. Students gain hands-on experience with the use of Tableau.

IS 660. Emerging IT Trends & Technologies. 3 Hours.
This course explores emerging IT trends and technologies arising in the business environment based on current events and business developments. The focus of this course will be on the presentation of emerging technologies and an exploration of their business role. Students will gain an appreciation for the business case associated with emerging technologies and IT trends facing IT managers.

IS 690. Current Topics in Information Systems. 3 Hours.
A study of selected current developments in information systems emphasizing development and managerial implications. Permission of instructor required.

College of Arts and Sciences

Dean: Dr. Kecia M. Thomas
Associate Dean of Graduate and Continuing Education: Dr. Rajesh K. Kana

The College of Arts and Sciences includes departments in the arts, humanities, mathematics, social, behavioral, natural and physical sciences.

The College offers 17 degree programs leading to a master's degree and 7 programs leading to a doctoral degree. Traditional programs as well as interdisciplinary and graduate level certificate programs help to keep the College on the leading edge of progressive academic offerings. Situated at the center of an internationally renowned research university and academic medical center, students and faculty in the College of Arts and Sciences have unparalleled opportunities to be part of the innovative and ground-breaking research and creative work that is the signature of UAB.

We offer a student-centered, experiential curriculum designed to prepare students not only for the careers and challenges of the 21st century, but also to be the leaders in the global marketplace of ideas. Students within arts and sciences programs develop the ability to understand diverse perspectives making them better prepared to work creatively and productively with others to solve the most important problems of our times.

Interdisciplinary Programs

Interdisciplinary programs of study are increasingly popular as we realize the benefits of multiple perspectives and methods to advance understanding and improve solutions. Students in the College of Arts and Sciences may pursue formal interdisciplinary programs such as the Master's degree in Cyber Security, which involves faculty from the departments of Computer Science and Criminal Justice (College of Arts and Sciences), and the Departments of Management, Information Systems Quantitative Methods, and Accounting & Finance (School of Business). Our newest Master's degree in Cultural Heritage Studies brings together art history, anthropology, and public administration.

Cyber Security

Program Contact Information

Email: csgradprogram@uab.edu

Program Information

The Master of Science in Cyber Security (formerly known as Computer Forensics and Security Management) (MSSec) is an interdisciplinary program that prepares graduates for a professional career in the field of cyber security by developing in them the necessary skills crucial for success. The program also provides current practitioners the opportunity to obtain advanced-level training to facilitate career advancement. The program includes a set of core, required courses and the opportunity to select from a default option or two tracks of specialization.

Admission Requirements

Students accepted into the program will have earned a bachelor's degree from an accredited college or university or recognized university from abroad. Most of these students will have earned a cumulative undergraduate grade point average (GPA) of 3.0 or higher. Applicants whose native language is not English are required to take either the TOEFL or the IELTS and score 80 or higher on the TOEFL or 6.5 or higher on the IELTS. **The GRE is NOT required.**

Students seeking admission to the program who lack a background in computer science but meet the remaining minimum requirements for admission *may* be admitted contingent on them completing a set of prerequisite courses (or their equivalents) that may include the following (the program directors may waive/require some courses in addition to the ones listed below depending upon the students' specific background). Among these CS 532 can be taken after admitted and count towards the MS degree.

Requirements		Hours
CS 103 & 103L	Introduction to Computer Science in Python and Introduction to Computer Science in Python Lab	4
CS 203 & 203L	Object-Oriented Programming in Java and Object-Oriented Programming Lab	4
CS 532 & 532L	Systems Programming and Systems Programming Lab	3

Similarly, students seeking admission to the program (especially to the Cyber-Crime Investigations track) who lack a background in criminal justice but meet the remaining minimum requirements for admission are encouraged to complete CJ 230 (The Judicial Process in America: An Overview).

Master of Science in Cyber Security

A total of 30 semester hours are required for the degree, organized into: (a) 15 hours of required **core courses**, (b) 6 hours of **electives** from an approved list of relevant Computer Science courses, and (c) 9 hours of coursework in one of the following two tracks: **Cyber Security track** or **Cybercrime Investigations track**.

a. Core coursework

Requirements		Hours
Core courses		
CS 534	Networking	3
CS 623	Network Security	3
CS 636	Computer Security	3
CS 689	Cyber Risk Management	3
CJ 502	Computer Forensics	3
Total Hours		**15**

b. Electives

In addition to the core courses, students must take two **CS** electives for a total of six hours. The electives must be from 500+ level or 600+ level. No more than 3 chrs of CS 598 or CS 697 can count towards the degree.

c. Tracks

In addition to the five core courses and two electives listed above, students must choose either of the following two tracks (Cyber Security Track or Cybercrime Investigations track, both worth 15 credit hours) to fulfill the requirements of the Master's degree.

1. Cyber Security Track

Requirements		Hours
CS 645	Modern Cryptography	3
CS 646	Blockchain and Cryptocurrency	3
CS 643	Cloud Security	3
Total Hours		**9**

2. Cybercrime Investigations Track

Requirements		Hours
CS/CJ 519	Investigating Online Crimes	3
CS/CJ 537	Digital Media Forensics	3
CJ 675	Law Evidence and Procedure	3
Total Hours		**9**

Interdisciplinary Graduate Certificate in Social Behavioral Statistics

Graduate Certificate in Social & Behavioral Statistics

The Graduate Certificate in Social & Behavioral Statistics is available to students currently enrolled in a Graduate Program who have a 3.0 GPA or higher.

Requirements		Hours
SOC 707	Statistical Programming for Social Sciences	3
Advanced Statistics Courses [1]		**12**
PY 719	Multivariate Statistical Methods	
or PY 719L	Lab for Multivariate Statistical Methods	
PY 727	Longitudinal Data Analysis Laboratory	
or SOC 70(	Advanced Longitudinal and Multi-level Data Analysis	
PY 746	Structural Equation Modeling	
SOC 704	Categorical Data Analysis	
Total Hours		**15**

1 Other advanced statistics electives may be approved by the Program Director

Contact

Program Director	Sylvie Mrug, Ph.D.
E-mail	smrug@uab.edu

Anthropology

The Anthropology of Peace and Human Rights Master's Program

Anthropology is the science committed to the comparative and historical study of humankind, looking across different cultural circumstances and into the depths of prehistory. Anthropology literally means the study of humanity and considers the interplay of biological and cultural factors. The Master's program at UAB introduces an innovative focus on peace, justice, human rights, and ecology, as considered from anthropological perspectives. The Anthropology of Peace and Human Rights encompasses knowledge and methodologies from social cultural anthropology, archaeology, and biological anthropology to explore these topics. Students are welcome to approach the Anthropology of Peace and Human Rights from the perspectives of these sub-disciplines. The program focuses on peace justice, sustainability, and human rights at different social levels ranging from individuals, families, communities, cultures, nations, to the international. Students consider how factors such as ecological sustainability, human security, democracy, justice, non-violence, conflict resolution, and human rights are interconnected and related to peace.

Anthropology offers a unique set of perspectives. It can contribute to understanding cultural diversity; reflection on cultural relativism; appreciation of multiculturalism; understanding of effective communication in cross-cultural interactions; knowledge regarding cultural variation in norms, values, beliefs, and culturally-embedded conflict resolution styles; and the development of respect for cultural differences and human rights. This unique knowledge-base and set of perspectives is at the heart of the Master's program's focus on peace and human rights, which contributes to the explicitly stated goals of the UAB College of Arts and Sciences to promote diversity and facilitate students meeting the challenges and opportunities posed by globalization. In accordance with the Strategic Plan of the UAB College of Arts and Sciences, the Anthropology of Peace and Human Rights seeks to "enhance students' global perspective" in an era where "globalization is diminishing the importance of national and political boundaries while increasing the opportunity for international harmony."

The history of the Civil Rights Movement in Birmingham, Alabama constitutes one reason why the development of peace and human rights at UAB is historically and culturally important. The Anthropology of Peace and Human Rights, with its educational purpose, can be seen as the continuation of positive developments made in social justice and civil rights in Birmingham and Alabama over the last half century. The Master's program complements the educational and outreach activities of the UAB Institute for Human Rights (IHR). The IHR and the Department of Anthropology work together on a variety of local and global projects. Anthropology faculty are involved in a variety of research, educational, and service activities, and work regularly with students to help them pursue their academic interests and to develop the skills needed locally and globally in the 21st century.

Nationwide, the graduates of peace and conflict studies programs have found positions in human and social services, community mediation organizations, in multicultural education, at legal centers, as U.S. Congressional staffers, at NGOs and human rights organizations, and at the United Nations. In addition to preparing students for such career paths, the Master's in the Anthropology of Peace and Human Rights aims also to ready students for doctoral studies in peace and human rights areas.

Educational Outcomes

Upon completion of the Master's program in the Anthropology of Peace and Human Rights, students will gain relevant and marketable skills and knowledge. Learning outcomes include, for example, for students to be able to:

1) Thoroughly integrate and critically analyze how factors such as ecological sustainability, human security, democracy, justice, peace, and human rights are interconnected constructs related to the unifying construct positive peace.

2) Discuss and explain the kinds of human rights violations that are currently taking place (e.g., against migrants, indigenous peoples,

women, and children) and analyze and critically evaluate the types of efforts that are ongoing to enhance and safeguard human rights worldwide.

3) Explain how cultural relativism relates (positively and negatively) to the application of human rights standards internationally, and students will develop culturally relativistic communication skills that are respectful of and open to cultural differences and different points of view.

4) Draw from multiple anthropologically relevant models and perspectives (e.g., models of socialization-enculturation, third-party mediation, conflict transformation, nonviolent practice, equity, social reciprocity, peace systems, and so forth) in order to apply anthropological perspectives to the analysis of problems in areas such as conflict resolution, peace education, social justice, and human rights protection.

Program Options: Plan I (Thesis) and Plan II (Exam)

The Anthropology of Peace and Human Rights is a two-year Master's program that requires a total of 36 semester hours. In consultation with an advisor, a student during the first year will make the choice to follow either the Plan I (thesis) or Plan II (no thesis) to complete the master's degree. All students, whether following the Plan I or Plan II path, will take the four required courses, which total to 12 semester hours (see below). Students following Plan I take 6 elective courses (18 semester hours), plus enroll in 6 semester hours of thesis credit. Students opting for Plan II, take 8 elective courses (24 semester hours), and at the end of their studies must pass a final exam that reflects the comprehensive activities of the student in the program, as prescribed in the UAB Graduate Student Handbook.

Required Curriculum

Four required courses are ANTH 504, ANTH 505, ANTH 509, & ANTH 652. For all students, two of the four are foundational (to be taken in the first year of study). These two courses, "Human Rights, Peace, and Justice" and "Anthropology of Peace, Justice, and Ecology" (the latter being team taught), are designed to provide an introduction to the topic of the Master's program. A required methods course, "Methods in Peace and Human Rights Research and Practice," can be taken either in the first or second year. The fourth required course, "Sustainable Peace Seminar," is an advanced seminar, to be taken in the second year of study.

All procedures and requirements listed in the UAB Graduate Student Handbook apply to this program. Whereas the program offers a diverse set of electives, a community internship also may be substituted for one 3 credit elective course. Additionally, recognizing both that the particular interests of students will vary and that certain relevant graduate level courses are offered in other UAB schools and College of Arts and Sciences departments or at the UA Anthropology Department, students will have the option of taking a maximum of two electives (6 credits) from other departments (e.g., Biology, History, or Justice Science). Finally, students can pursue their interests by requesting to work on a Special Problems (independent study) course under the guidance of a professor within the Anthropology Department (e.g., ANTH 587, ANTH 588, or ANTH 686).

Advising

Upon entry into the Master's program, each student will be assigned an academic advisor from among the Anthropology faculty. The student and advisor will confer and develop a study plan that is in accordance with the student's interests and the requirements of the Master's program. Early on, students can consult with their advisors about whether to pursue either Plan I (thesis) or Plan II (exam). Advisors will be assigned to match as closely as feasible a student's areas of interest and also in such a way as to distribute the advising duties across the Anthropology faculty. Near the end of the first year, students can request to change advisors if they think a particular faculty member's area of expertise aligns with their thesis topic.

Student Support

Several Graduate Teaching Assistantships and Graduate Research Assistantships are awarded by the Department of Anthropology each semester on a competitive basis. Additionally, some graduate students are employed part-time as assistants on research projects. International students should consult with the Graduate Director about possible tuition reductions. More information can be found here.

Admissions

The deadline for applications for the fall semester will be early in the spring semester. Please check with the Graduate School or the Graduate Program Director for exact deadlines. All of the minimum criteria for admission set by the UAB Graduate School must be met, and the Department of Anthropology has some additional admission requirements.

For details on the Graduate School admission requirements, see the Graduate School website. A brief summary of the requirements is as follows:

•An online application and payment of an application fee.

•A personal statement as part of the application that specifies your academic interests, career goals, and relevant background experience, in this case, in relation the Anthropology of Peace and Human Rights program to which you are applying. Include in your personal statement any peace and human rights volunteer work or work experience, and any other relevant information as to why you wish to study in this program.

•A recognized baccalaureate, graduate, or professional degree.

•A 3.0 (B average) grade point average over the last two years of study.

•Previous studies that are acceptable in quality and content to the program (see Departmental Requirement below also).

•One official transcript from each postsecondary school attended.

•If currently enrolled at another institution, applicants must provide both provisional and final transcripts, the latter showing the completion of a degree prior to enrollment in UAB.

•For international students whose first language is not English, the minimum scores on an English proficiency exam as specified by the Graduate School.

The following are additional admission requirements of the Department of Anthropology:

•At least two letters of recommendation.

•Applicants who have not 1) majored in anthropology, 2) minored in anthropology, or 3) taken at least five courses in anthropology, with grades of C or higher may be required to enroll in ANTH 605 - Advanced

Cultural Anthropology, or a comparable course offering background in anthropology, in the first semester of Master's study.

Further Information

For more information about the faculty, researchers, direction, and focus of the department, please see our Department of Anthropology web pages.

Master of Arts in Anthropology of Peace and Human Rights

The M.A. degree requires a minimum of 36 credit hours for the Anthropology of Peace and Human Rights program.

Plan I

Requirements		Hours
ANTH 504	Human Rights, Peace, and Justice	3
ANTH 505	Anthropology of Peace, Justice, and Ecology	3
ANTH 509	Methods in Peace & Human Rights Research & Practice	3
ANTH 652	Sustainable Peace Seminar	3
Elective Courses [1]		**18**
ANTH 508	Conflict Resolution in Cross-Cultural Perspective	
ANTH 512	Peaceful Societies and Peace Systems	
ANTH 513	Peace & Environmental Sustainability	
ANTH 514	Prehistory of War and Peace in North America	
ANTH 515	Peace through Global Governance	
ANTH 516	War & Peace in Ancient Mesopotamia	
ANTH 517	Peace Ethology	
ANTH 518	The Power of Nonviolence	
ANTH 519	Religion, Reconciliation, & Forgiveness	
ANTH 521	Technological Monitoring of Cultural Resources, Human Rights and Conflict	
ANTH 524	Transitional Justice and Human Rights	
ANTH 526	NAGPRA, Repatriation, and Indigenous Rights	
ANTH 531	Memory and Memorialization	
ANTH 532	Villains, Victims, & Vigilantes	
ANTH 533	Anthropology of Art	
ANTH 543	Propaganda, Fake News, and Hate Speech	
ANTH 587	Special Problems in Peace Research	
ANTH 588	Special Problems in Human Rights	
ANTH 601	Forensic Anthropology	
ANTH 602	The Conquest of Mexico	
ANTH 605	Advanced Cultural Anthropology	
ANTH 613	Human Osteology	
ANTH 627	Archaeological Laboratory Methods	
ANTH 633	Economic Development and Indigenous Societies	
ANTH 636	Community Internship	
ANTH 641	Anthropology of Human Rights	
ANTH 645	Medical Anthropology & Health Disparities	
ANTH 650	Nationalism Ethnicity and Violence	
ANTH 654	Biological Anthropology and Contemporary Issues	
ANTH 660	Ecological Anthropology	
ANTH 664	Political Anthropology	
ANTH 686	Special Problems in Applied Anthropology	
ANTH 697	Special Topics in Anthropology [2]	
Thesis		**6**
ANTH 699	Thesis Research	

Plan II

Requirements		Hours
ANTH 504	Human Rights, Peace, and Justice	3
ANTH 505	Anthropology of Peace, Justice, and Ecology	3
ANTH 509	Methods in Peace & Human Rights Research & Practice	3
ANTH 652	Sustainable Peace Seminar	3
Anthropology Electives [1]		**24**
ANTH 508	Conflict Resolution in Cross-Cultural Perspective	
ANTH 512	Peaceful Societies and Peace Systems	
ANTH 513	Peace & Environmental Sustainability	
ANTH 514	Prehistory of War and Peace in North America	
ANTH 515	Peace through Global Governance	
ANTH 516	War & Peace in Ancient Mesopotamia	
ANTH 517	Peace Ethology	
ANTH 518	The Power of Nonviolence	
ANTH 519	Religion, Reconciliation, & Forgiveness	
ANTH 521	Technological Monitoring of Cultural Resources, Human Rights and Conflict	
ANTH 524	Transitional Justice and Human Rights	
ANTH 526	NAGPRA, Repatriation, and Indigenous Rights	
ANTH 531	Memory and Memorialization	
ANTH 532	Villains, Victims, & Vigilantes	
ANTH 533	Anthropology of Art	
ANTH 543	Propaganda, Fake News, and Hate Speech	
ANTH 587	Special Problems in Peace Research	
ANTH 588	Special Problems in Human Rights	
ANTH 601	Forensic Anthropology	
ANTH 602	The Conquest of Mexico	
ANTH 605	Advanced Cultural Anthropology	
ANTH 613	Human Osteology	
ANTH 627	Archaeological Laboratory Methods	
ANTH 633	Economic Development and Indigenous Societies	
ANTH 636	Community Internship	
ANTH 641	Anthropology of Human Rights	
ANTH 645	Medical Anthropology & Health Disparities	
ANTH 650	Nationalism Ethnicity and Violence	
ANTH 654	Biological Anthropology and Contemporary Issues	
ANTH 660	Ecological Anthropology	
ANTH 664	Political Anthropology	
ANTH 686	Special Problems in Applied Anthropology	
ANTH 697	Special Topics in Anthropology	
Comprehensive Exam		
Total Hours		**36**

1 Additional elective options can be approved by the program director.

2 Approval of special topics courses is required regarding their topical relevance to the program.

Courses

ANTH 504. Foundations in Anthropology. 3 Hours.
This is a companion course to ANTH 505, designed for first-year Masters students. Both courses explore the central themes of the MA program, including peace systems, human rights, social justice, and global ecological and sociopolitical interdependence. Both analytical and applied approaches to anthropological research and practice are examined. In the first semester, in ANTH 504, these central themes are explored empirically, primarily through an intensive survey of select ethnographic literature.

ANTH 505. Anthropology of Peace, Justice, and Ecology. 3 Hours.
This is a companion course to ANTH 504, designed for first-year Masters students. Both courses explore the central themes of the MA program, including peace systems, human rights, social justice, and global ecological and sociopolitical interdependence. In the second semester, in ANTH 505, these central themes are explored through a critical examination of comparative and theoretical literature. This is a team-taught course, directed by a course master and involving select faculty from the department and across the University.

ANTH 508. Conflict Resolution in Cross-Cultural Perspective. 3 Hours.
This course explores conflict and conflict management from an anthropological perspective. It includes ethnographic examples from around the globe. Do all societies engage in war? How are conflicts handled in other cultures? The course will challenge a Western view that humans are naturally violent and warlike and consider some interesting anthropological controversies. Specific topics considered include conflict models, origins of war, conflict resolution, socialization of conflict styles, third party mediation, and ways to reduce violence and prevent war.

ANTH 509. Methods in Peace & Human Rights Research & Practice. 3 Hours.
The study of peace, justice, ecology, and human rights draws on a diverse methodological tool-kit and comprehensive skill-sets. This course introduces students to some of these methods such as using online databases, conducting interviews, text analysis, meta-analyses and literature reviews, participant observation, behavior observation, and content analysis. Concrete examples of research methods and practice reveal the interconnectedness of basic and applied research as well as theory and practice.

ANTH 512. Peaceful Societies and Peace Systems. 3 Hours.
This course explores peaceful societies, some of which are internally peaceful and some of which do not make war, as well as peace systems, that is, clusters of neighboring societies that do not make war on each other and possibly not with any outside groups either. The main questions addressed in the course are: How do peaceful societies and peace systems manage to successfully keep the peace? What lessons do peaceful societies and peace systems hold for creating a less violent and warless world?.

ANTH 513. Peace & Environmental Sustainability. 3 Hours.
By highlighting that ecology sets the stage for the social and economic domains, this course traces our interdependence with nature and makes the case that sustaining the natural conditions that are essential for the functioning of the ecosystem on which our lives depends equals sustaining peace. The course takes a positive peace perspective on environmental sustainability goals and methods to achieve them.

ANTH 514. Prehistory of War and Peace in North America. 3 Hours.
This course explores the origins, development, and consequences of conflict and warfare among the prehistoric and early historic Indigenous cultures of North America, as well as the complimentary processes of cooperation and peace-making. Archaeological, biological, and ethnohistorical sources are utilized to understand the ways in which war and peace were carried out among a wide variety of Native American cultures from the earliest evidence of human occupation to European contact and beyond. Both Indigenous and European practices of war and peace are considered.

ANTH 515. Peace through Global Governance. 3 Hours.
Global governance represents a new dimension in social organization. Anthropology has much to contribute to understanding it. Global governance has the potential to promote social progress and human development, the protection of human rights, peace, and human security. The course examines security—-military, collective, and human security —-and the evolution of international identity, norms, values, and laws and their contributions to the development of global civil society.

ANTH 516. War & Peace in Ancient Mesopotamia. 3 Hours.
“War & Peace in Ancient Mesopotamia” (ca. 10,000 - 323 BCE) begins with an introduction to the advent of farming, urban life, various crafts, writing, and other innovations in the region of the "Two Rivers," namely the Tigris and Euphrates' flood plain. It proceeds with the rise and fall of early state complex societies and empires in the Bronze and Iron Ages, and terminates in the Persian period. Although providing much focus on diverse issues dealing with war, alliances, diplomacy, treaties, and peace, this course also integrates a comprehensive background context and overview of other aspects of past societies in this region, including history, archaeology, language, literature, religion, architecture, art, material culture, and trade.

ANTH 517. Peace Ethology. 3 Hours.
This course provides insights into causes, mechanisms, development, function, and evolution of peaceful behavior in humans and nonhuman animals. The course shows how studying the role of peaceful behavior in the survival and propagation of animal life has direct significance for improving our understanding of the evolved abilities for peace in humans.

ANTH 518. The Power of Nonviolence. 3 Hours.
This course introduces students to the theory and practice of nonviolence as a manner of social change and as a philosophy. The course explores some of the classic writings on nonviolence such as those by Tolstoy, Gandhi, and King as well as current research findings on the efficacy of nonviolent social change, for instance, the work of Sharp, Nagler, Ackerman, and Chenoweth. Readings, films, small group and whole class discussions, guest lectures by activists will contribute to an understanding of the necessary skills for practicing and promoting nonviolent social change. Students will develop projects and presentations that utilize an online nonviolence database.

ANTH 519. Religion, Reconciliation, & Forgiveness. 3 Hours.
This course examines the role of religion, spirituality, reconciliation, apology, and forgiveness in conflict situations, from the individual to the global. Topics include the role of religion in both war and peace. The course has a cross-cultural and inclusive dimension and goes well beyond Christianity to also consider Buddhism, Confusianism, Islam, and other religions. The spiritual dimensions of Gandhian nonviolence are also considered.

ANTH 521. Technological Monitoring of Cultural Resources, Human Rights and Conflict. 3 Hours.
This class will give students an overview of how cultural heritage and humanitarian work intersects with innovation and technological advances. The class will introduce students to how social media, remote sensing technologies/drones, cell phones, open source, crowd sourcing, Big Data, cloud computing, the Internet, and sensors are all changing how we collect data and interpret the world around us, and how that information is revolutionizing cultrual preservation efforts as well as humanitarian and conflict monitoring.

ANTH 523. Vikings: Raiders, Traders, Farmers. 3 Hours.
The Vikings are most popularly thought of as warriors raiding settlements along the northern coastline of Europe during the Viking Age (ca. 793 – 1050 AD), but their society and activities extended well beyond this scope. This course furnishes an overview of Viking social structure, subsistence, art, architecture, religion, language, and literature. It covers hostile and peaceful interactions with the peoples of Greenland, the Arctic, Labrador and Newfoundland and considers the evidence for Norse explorations and influence in North America.

ANTH 524. Transitional Justice and Human Rights. 3 Hours.
Significant developments in politics, law, and human rights occur during periods of transitional justice. Anthropology is invaluable for understanding these developments, including conceptions of justice, truth-seeking, memory and memorials, reparations, institutional reform, and human rights discourse. This course begins with the Nuremberg Trials and progresses through the major historical events that shaped transitional justice throughout the 20th and 21st centuries. These include the abuse of amnesty laws during the Cold War; the development of truth and justice commissions, international criminal tribunals, and hybrid courts in the 1990s; and the establishment of the International Criminal Court (ICC) in the 2000s. The course concludes by examining contemporary issues such as reparations, war torts, post-conflict memory and education, ongoing conflicts worldwide, and the future of the ICC.

ANTH 526. NAGPRA, Repatriation, and Indigenous Rights. 3 Hours.
Debates over the return of Native American cultural property from university and museum settings across the country lie at the forefront of modern archaeological research in the United States. Central to these debates are critical questions about the rights of Indigenous peoples, the intellectual freedom of researchers, the importance of cultural resource and heritage management, and the history and role of museums today. This seminar course introduces students to the Native American Graves Protection and Repatriation Act (NAGPRA) as federal law and further examines the impacts of this law through a multiplicity of involved perspectives. Class discussions will examine legal, ethical, anthropological, museum, and tribal perspectives, including both the theoretical and practical aspects of NAGPRA compliance and repatriation.

ANTH 527. Anthropology of Peoples and their Dogs. 3 Hours.
This course explores how a comprehensive assessment of the long-term mutualistic relationship between humans and dogs can yield insights and offer ways in which modern global challenges of peace and sustainable development can be approached. The course takes a four-field approach as it discusses the evolution of the domestic dog from its wild ancestor the grey wolf, investigates the archeology of dog domestication, looks into the etymology of words used to describe dogs and the specifics of their bond with humans across multiple cultures, and investigates and describes the origins of modern dog breeds within their relevant cultural context. The emergence of the evolutionary, economic and social relationships between humans and dogs serves as an example of the relationships that exist between humans and all other domestic and wild animals. Dealing with global challenges of peace and sustainable development requires a perspective that not only places humans squarely among other animals, but also considers the shifting relationships between people and all other organisms. The dog-centric and four-field approach of this Anthropology course aims to provide a new model for future academic inquiry and engagement with both local and global peace agendas.

ANTH 528. Drugs and Culture. 3 Hours.
This course takes a cross-cultural perspective on experiences with mind-altering substances. It explores world views about what counts as a ‘drug’ and how drugs fit in with systems of moral judgement and social relationships. Together, we will consider case studies that explore how drugs fit into cultural and social contexts around the world. Specific topics include drug use in human history, drugs in contexts of healing, spirituality, and recreation; addiction, drug production and trade as a form of livelihood, and legality and the War on Drugs (considering drug penalties, public health vs. criminal approaches, social justice & human rights, etc.). We will also examine career contexts where cross-cultural knowledge of drugs would be beneficial.

ANTH 531. Memory and Memorialization. 3 Hours.
This class explores memory, collective memory, and the uses made of historical narratives, artifacts, and memorials in diverse cultural settings. The course begins with an exploration of the complex relationship between history, cultural identity, and collective memory. It then considers collective memory at multiple levels of society, including nationalism and national memory, post-conflict settings and the development of traumatic memory and social amnesia, and conflicting narratives over peace and war monuments and memorialization.

ANTH 532. Villains, Victims, & Vigilantes. 3 Hours.
This course examines ways in which the concepts of “rights” and “justice” are understood and enacted in local communities, particularly in regions of the world experiencing high rates of violent criminality. Beginning with a review of formal law and legal principles underlying state systems of justice, the course surveys settings in which dissatisfaction with state efforts to protect rights have induced communities to develop alternate policing and judicial institutions.

ANTH 533. Anthropology of Art. 3 Hours.
This course surveys the anthropology of art, focusing on economic, historical, and aesthetic dimensions of Western and non-Western art forms. The course considers the problem of whether “art” is a universal cultural phenomenon and examines cross-cultural aesthetics; form, style, and meaning in multiple cultural contexts; and the convergence of anthropology, art history, museum studies, and the marketing of culture. The course concludes with a brief discussion of contemporary art practices with respect to expressive culture and considers the power of art as it relates to knowledge, language, and culture.

ANTH 543. Propaganda, Fake News, and Hate Speech. 3 Hours.
This course examines the challenges of propaganda, fake news, and hate speech for human rights and peacebuilding. It begins with a brief history of propaganda and explores the relationship between technology and mass persuasion, including the speed and scope of social media in the current global context. The course then draws from anthropology to understand how misinformation, disinformation, and hate speech interact with culture, politics, and public discourse, and ultimately influence individual decision-making. The course then turns to human rights, peace studies, and law to explore open questions regarding speech freedoms, prohibitions against hate speech, international speech crime trials, and current measures taken by social media companies, courts, and governmental agencies to regulate speech online.

ANTH 587. Special Problems in Peace Research. 3 Hours.
Supervised study of specified topic area in peace studies; defined problem explored in depth. Topics are determined by student and instructor interest.

ANTH 588. Special Problems in Human Rights. 3 Hours.
Supervised study of specified topic area in Human Rights; defined problem explored in depth. Topics are determined by student and instructor interest.

ANTH 601. Forensic Anthropology. 4 Hours.
Forensic Approaches to Osteology Applied human osteology, emphasizing ability to identify age, sex, and population type of skeletal material. Effects of disease and behavior on bones.

ANTH 602. The Conquest of Mexico. 3 Hours.
This course examines the Spanish conquest of Mexico from both Spanish and indigenous perspectives. It further surveys the institutionalization of Spanish control over the fallen Aztec Empire and the broader intellectual and material consequences of the conquest.

ANTH 605. Advanced Cultural Anthropology. 3 Hours.
Advanced Cultural Anthropology Critical review of theoretical approaches in cultural anthropology.

ANTH 608. Advanced Linguistic Anthropology. 3 Hours.
Advanced LINGUISTIC Anthropology Historical development of theory and field practice of linguistics; psycholinguistics, sociolinguists, nonverbal communication, semiotics, and ethnosemantics; applied linguistics.
Prerequisites: ANTH 120 [Min Grade: C]

ANTH 609. Archaeological Ethics and Theory. 3 Hours.
Advanced Archaeological Anthropology Principal theoretical approaches to 19th/20th century archaeology; historical, processual, and post-processual.

ANTH 610. Advanced Biological Anthropology. 3 Hours.
Advanced Biological Anthropology Human evolution, primatology, race, human genetics. Tasks performed by physical anthropologists.

ANTH 611. Field Archaeology. 3-6 Hours.
Field Archaeology Archaeological field and laboratory techniques, including excavation, surveying, and artifact analysis and description; general problems of archaeological interpretation.

ANTH 613. Human Osteology. 3 Hours.
The identification of human skeletal remains. This laboratory/lecture course provides the groundwork for much of the work in physical anthropology. The first course of the sequence into Anth 401/601.

ANTH 615. Ethnographic Field Methods. 3-6 Hours.
Ethnographic Field Methods Classroom instruction and practical experience in techniques of ethnographic fieldwork, including participant observation, household surveys, structured and unstructured interviewing, and genealogies.

ANTH 619. Food and Culture. 3 Hours.
This course is designed to present a broad view of the role of food in human culture through time and in a variety of geographic settings, offering students and opportunity to reflect on the cultural meanings of food in human life. Class lectures, assigned readings, and films will be used to enhance each student s understanding of the subject from a cross cultural perspective. We will examine the biological basis of diet how foodways develop and change, how and why anthropologists study diet, and variations in foodways around the world.

ANTH 622. Landscape Archaeology. 3 Hours.
The course will cover the techniques and strategies employed by archaeologists to reconstruct past landscape, which involves scientific testing, remote sensing, GIS, survey, excavation and environmental analysis. Examples will be drawn from projects across diverse landscape types in Europe, the Middle East, Africa, Central America and Asia. In-field and laboratory application of techniques will be emphasized.

ANTH 624. The Law of Historical and Cultural Resources. 3 Hours.
This survey course will familiarize students with federal and state laws and regulations relevant to archaeology and anthropology, such as the Antiquities Act, National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), Archeological and Historic Preservation Act (AHPA), Archaeological Resources Protection Act (ARPA), and the Native American Graves Protection and Repatriation Act (NAGPRA), among others. It will also introduce students to other legal issues such as obtaining National Register listings, preservation easements and federal income tax rehabilitation credits.

ANTH 625. African-American Archaeology. 3 Hours.
African American Archaeology is one of the better established research interests within U.S. Historical Archaeology. This course will examine the development of the archaeology of the African diaspora from its beginnings in the 1960s to the present day. Its principal focus will be the plantation of the Southern United States. The course will include an examination of history of the plantation economy as well as an exploration of issues currently of interest to archaeologists studying the archaeological record of African American life.

ANTH 627. Archaeological Laboratory Methods. 3 Hours.
This course introduces students to the principles and practice of archaeological laboratory research. The goal of the course is to familiarize students with the stages of archaeological research that follow fieldwork and precede publication. Emphasis is placed on practical, hands-on experience in identifying and analyzing archaeological remains, as well as building interpretations of the past through their analysis.

ANTH 628. Comparative Religion. 3 Hours.
Human behavior in relation to the supernatural; religion as a system of social behavior and values; theories of religion.

ANTH 629. Egypt: Arch Field School. 6 Hours.
Two week field school in Egypt. Students will visit Egypt old and new, including Islamic Cairo, Coptic churches, the pyramids of Giza, Alexandria, the tombs and temples of Luxor (Valley of the Kings), Aswan (Abu Simbel), and an archaeological excavation. Experience Egyptian folklore through dance and musical performances.

ANTH 630. Zooarcheaology. 3-6 Hours.
This course includes an introduction to methods and theories of zooarchaeological research. Practical experience in processing, identification, and interpretation of animal bone remains from archaeological sites forms a large part of class time.

ANTH 631. Bones. 3 Hours.
This course allows students to critically explore the anthropological sub-discipline of biological anthropology with a focused study of bone, the skeleton, and ways of interpreting skeletal remains. It begins with human osteology and forensic anthropology, including anatomy and historically important methods for determining race/ancestry and sex from the skeleton. Next, it presents comparative anatomy, zooarchaeology, and paleoanthropology to understand how anthropologists use the skeleton to support arguments about animal evolution (including humans and their extinct relatives), and the ways humans fit into and shaped ancient ecosystems.

ANTH 634. Observing the Earth from Space. 3 Hours.
The course will give students the ability to analyze remotely sensed data from satellite images. Students will learn about the physics and mathematics behind remote sensing. They will also learn about the wide range of satellite images and techniques to analyze them via ERDAS Imagine, ER Mapper and other programs. Applications of remote sensing to a variety of fields will form a key component of the class. The course will culminate in a term project involving remote sensing applications to UAB faculty-led initiatives in health, medicine, geography and anthropology. There will be a weekly lab component of the course.

ANTH 636. Community Internship. 3-6 Hours.
Application of anthropological approaches to the efforts of a public or private sector. Institutional approval of both the host institution and the department of anthropology required before registration.

ANTH 637. Real World Remote Sensing App. 3 Hours.
This course will be offered as a research seminar focusing on real world applications of remote sensing technology. Students will work closely with UAB professors and scientists at NASA's Marshall Space Flight Center in Huntsville doing original remote sensing research on new satellite datasets. These datasets cover diverse areas including terrorism, global warming, health, anthropology / archaeology, atmospheric studies, urban expansion and coastal management. Students will be responsible for analyzing the satellite imagery and presenting papers to NASA.

ANTH 640. Arch and Hist Bible Lands. 3 Hours.
Archaeology and History of the Bible Lands. Examination of region spanning modern Syria, Lebanon, Isreal, and Jordon from 10,000-585 BC.

ANTH 641. Anthropology of Human Rights. 3 Hours.
Examination of conceptual, political, and legal aspects of human rights from an anthropological perspective. Topics considered may include: state violence; the history of human rights claims; the opposition of cultural rights and human rights claim; human rights as a form of political discourse; human rights practices in select contemporary settings.

ANTH 642. Historical Archaeology. 3 Hours.
This course involves all stages of archaeological filed work at a historical archaeology site. Students will learn survey skills, excavation, mapping, recovery, and post-field analysis techniques.

ANTH 645. Medical Anthropology & Health Disparities. 3 Hours.
This course explores the bio-cultural basis of health and cross-cultural variation in illness and healing which includes theoretical bases of medical anthropology, comparative health care systems, and social, political, and economic issues related to health care delivery.

ANTH 646. Explorers, Mummies and Hieroglyphs. 3 Hours.
This course provides a thematic approach to pharaonic Egypt in general, with one portion covering diverse aspects such as geography, an overview of the history of Dynasties 1-31, society and government, daily religion, mortuary religion, architecture, literature, the military, trade, economy, and daily life. Another portion of the course provides several documentaries regarding early to more recent explorers and Egyptologists. The third focus introduces Egyptian hieroglyphs in eight grammar classes and follow-up user-friendly, in-class exercises, aiming to enable students to translate basic hieroglyphic texts.

ANTH 647. Advanced Peace Studies. 3 Hours.
Intensive exploration of concepts and issues involved in the study of peace, social justice, nonviolence and conflict resolution. Students will engage in an in-depth examination and critique of anthropological approaches to peace and the associated theoretical and practical problems and applications.

ANTH 648. Cleopatra’s World: Alexander to Caesar. 3 Hours.
“Cleopatra’s World: Alexander to Caesar” (ca. 359–31 BCE) begins with an overview to the geographical and political setting in the Mediterranean prior to and during the Hellenistic period. It proceeds with a historical summary of the reigns of Philip II and Alexander the Great (including the Macedonian defeat of the Persian Empire). It continues with the Macedonian-Ptolemaic kingdom in Egypt and surrounding regions (touching upon the fight for the succession to Alexander’s empire, the formation of Hellenistic kingdoms, the foundation of Ptolemaic Egypt and Alexandria, and the end of Ptolemaic Egypt, particularly Cleopatra VII, Julius Caesar, Mark Anthony, and Octavian [Augustus]). After furnishing the historical background to key Ptolemaic rulers, the course proceeds with covering various themes, including Ptolemaic kingship, society in Egypt (especially Greeks versus Egyptians), settlements (including the foundation and nature of Alexandria and other key Greek and Egyptian settlements), agriculture, mines, and the economy, religion (including tombs, temples, beliefs, and practices), art and architecture, the military (army and navy), and other aspects (e.g., the Meroitic Empire; late Roman Republic).

ANTH 649. Egyptian History & Arch. 3 Hours.

ANTH 650. Nationalism Ethnicity and Violence. 3 Hours.
Social and cultural analysis of ethnicity and nationalist ideologies particularly where these have led to violent confrontations within modern nation-states. Considers primordialist versus constructionist theories of difference; the varying weight to be attributed to political, historical and cultural factors in the study of nationalism; and the politics of culture vs the culture of politics.

ANTH 652. Sustainable Peace Seminar. 3 Hours.
This course will focus on the integration of knowledge related to peace, justice, ecology, and human rights, or in other words, on the numerous interrelated aspects of the “positive peace” concept. This course is a seminar, meaning that participants will engage in much discussion. In turn, participants will present topics for discussion and others will respond and engage in dialogue. At times the focus will be on one participant’s research, and at other times the focus will be on a particular book or set of readings.

ANTH 653. Primatology. 3 Hours.
Biology, behavior, and distribution of living non-human primates Emphasis on field studies of old-world monkeys and apes.

ANTH 654. Biological Anthropology and Contemporary Issues. 3 Hours.
This course applies a biological anthropological perspective to explore what it means to be human and to develop critical perspectives on our culture, science, and media. How did humanity arrive in its current position? How do we understand human diversity? What can we learn from the differences among people, their overwhelming biological similarity, and their common humanity? How do we use this knowledge to build a sustainable future for ourselves?.

ANTH 655. Archaeology of Alabama. 3 Hours.
This course explores the archaeology of Alabama and adjacent areas of the Southeastern United States, spanning some 13,000+ years of human history. Throughout the course, students will be introduced to the rich history and diversity of Indigenous cultures of the Southeast, from big game hunters of the Ice Age to the rise of large, complex chiefdoms. Case studies are used to demonstrate how archaeologists use the archaeological record to make interpretations about the lives of past peoples throughout the ancient Southeast.

ANTH 656. Current Issues in Cultural Heritage. 3 Hours.
Students in this class will be taken around the world, continent by continent, and under the ocean, delving into the most pressing issues around modern pressures on cultural heritage: war, climate change, propaganda, media, tourism, politics, colonialism, and economics. We'll have guest lecturers who represent the most cutting-edge work being done in cultural heritage from international organizations. Students will get hands on experience working through current cases and projects and will be taught how to design their own cultural heritage site management plan as a course project. This class will prepare students to think critically about numerous issues impacting cultural heritage today and will help to prepare them to be leaders in their own rights in this developing field.

ANTH 657. Anthropology of Gender. 3 Hours.
Cultural construction of gender differences in human societies; shifting definitions of proper male and female roles across cultures and through time.

ANTH 658. Human Sexuality. 3 Hours.
This course will explore human sexuality and gender from an anthropological perspective, including biological and cultural perspectives, as well as the areas where anthropology meets psychology. The evolution of sexual behavior in humans and in non-human primates will be examined, as well as how sexuality is embedded in socio-cultural context both across and within societies.

ANTH 659. Politics, Drugs and Society in Latin America. 3 Hours.
This course will examine the role of drug production and the drug trade in the economic and political life of Latin American societies. Viewed historically and ethnographically, the course will include coverage of the traditional uses of drugs in indigenous societies as well as the more recent globalization of the industry.

ANTH 660. Ecological Anthropology. 3 Hours.
Examines interactions among behavioral, technological, organizations, and ideological features of human cultures that serve to adapt societies to their physical environment.

ANTH 662. Environment and Health. 3 Hours.
This course engages students in critically examining anthropological perspectives on the relationship between the biophysical environment and human physical health, with an emphasis on practical and theoretical approaches to contemporary environmental health challenges in the contexts of disease, food production, natural disasters, radioactivity and toxicity, urban environments, mental health, and social inequalities. The course includes consideration of positive ways forward.

ANTH 663. Technical Writing for Archaeology. 3 Hours.
This course will familiarize students with the structure, style, and requirements for writing Cultural Resource Management (CRM) reports for archaeological sites. Students will learn how to interpret archaeological data from CRM excavated sites and translate that data into detailed and specifically formatted reports based on laws and regulations regarding archaeological sites. Students will also practice making archaeological knowledge more accessible to the non-archaeologist.

ANTH 664. Political Anthropology. 3 Hours.
The Comparative analysis of political structures and process throughout the world, focusing especially on non-Western forms; a survey of anthropological attempts to understand the complex interplay of culture and power in human societies.

ANTH 667. Museum Studies. 3 Hours.
Designed for students interested in museums and museum-related careers, this course introduces the field of museum studies, with a focus on anthropology and natural history museums. This course uses case studies, guest lectures and field trips, hands-on collections work, and problem-based learning exercises to demonstrate real-world museums work to students. Topics covered include museum legal and ethical guidelines, standard collections care, organization and display of exhibits, and collaboration with museum communities and visitors, as well as key contemporary issues such as contested rights to collections and the representation and interpretation of cultures in museum settings.

ANTH 669. Ethnography of Mexico. 3 Hours.
Comparative and historical analysis of rural Mexican communities, emphasizing the impact of neoliberal economic policies and democratic political reforms.

ANTH 680. Anthropology of Peace & Human Rights Proseminar. 0 Hours.
The Proseminar provides an opportunity for graduate students to participate in a community of scholars as a means for integrating and developing coursework, independent research and scholarly inquiry, knowledge, and skills.

ANTH 686. Special Problems in Applied Anthropology. 3 Hours.
Supervised study of specified topic area in peace studies; defined problem explored in depth. Topics are determined by student and instructor interest.

ANTH 691. Special Problems in Cultural Anthropology. 1-6 Hour.
Special Problems in Cultural Anthropology Supervised study of specified topic area; defined problem explored in depth. Topics determined by student and instructor interest in cultural anthropology.

ANTH 692. Special Problems in Archaeology. 1-6 Hour.
Special Problems in Archaeology Supervised study of specified topic area; defined problem explored in depth. Topics determined by student and instructor interest in archaeology.

ANTH 693. Special Problems in Linguistics. 1-6 Hour.
Special Problems in Linguistics Supervised study of specified topic area; defined problem explored in depth. Topics determined by student and instructor interest in linguistics.

ANTH 694. Special Problems in Biological Anthropology. 1-6 Hour.
Special Problems in Biological Anthropology Supervised study of specified topic area; defined problem explored in depth. Topics determined by student and instructor interest in special topics in biological anthropology.

ANTH 697. Special Topics in Anthropology. 0-3 Hours.
Topics vary. See class schedule for topic.

ANTH 699. Thesis Research. 1-6 Hour.
Thesis Research Independent development of research project.
Prerequisites: GAC M

Art History

To obtain specific admissions requirements on how to apply to Graduate School, prospective students should visit this page: https://www.uab.edu/cas/art/graduate/ma-art-history

Degree Offered:	M.A.*
Director:	Noa Turel, Ph.D.
Phone:	(205) 934-8973
E-mail:	nturel@uab.edu
Website:	www.uab.edu/cas/art

* A program leading to the Master of Arts degree in art history is offered jointly by UAB and the University of Alabama (Tuscaloosa). The MA degree in Art History prepares students for further academic study at the doctoral level or for professional careers in museums, galleries, and other arts-related fields.

Admission Requirements

For admission in good standing, applicants to UAB must meet Graduate School requirements for scholarship. A Minimum GPA of 3.0 (B) is required for acceptance into the program. The applicant should have completed 24 semester hours in art history and related areas such as history, aesthetics, archaeology, and anthropology, although this requirement may be reduced depending on the applicant's background and preparation. It is desirable that an applicant be able to read a foreign language related to the proposed field of study. Students may apply for admission for either the fall or spring semester.

Degree Requirements

Plan I: Thesis Track

Courses

Plan I students must complete 24 semester hours in art history.*
For breadth of knowledge, students must take at least one Western and one non-Western course, and take courses in both modern and pre-modern time periods. A maximum of 3 semester hours of independent study will be permitted. Each student must take ARH 680, which should be taken in the first semester of enrollment in the M.A. program, as well as ARH 652 Advanced Research Seminar, which should be taken in the final semester of coursework. Each student must take at least 6 semester hours of coursework at the University of Alabama (Tuscaloosa).

* Note: A maximum of 6 of the required hours in art history may be taken in a related field with the concurrence of the joint faculty.

Foreign Language Requirement

By the completion of 15 hours of coursework towards the M.A., students should have met the language requirement of a reading knowledge of one foreign language relevant to the student's area of study, approved by the Graduate Program Director and Faculty Advisor. Students may demonstrate language competency by passing a translation exam administered by the Department of Foreign Languages (French or German) or by attaining at minimum a B in a 200-level course (e.g. FR 201 or FR 202 or GN 201 or GN 202). For other languages, students must consult with the Graduate Program Director and Faculty Advisor and arrange an appropriate translation exam or course to fulfill the language requirement. Students may not enroll in ARH 652 until the language requirement is completed. A reading knowledge of a second foreign language is strongly recommended. Students may not advance to candidacy until the language requirement is completed.

Thesis

The student must present a thesis under the direction of a member of the joint art history faculty. Each student will register for ARH 699 for 6 semester hours of credit. Students must be registered for at least 3 hours of thesis credit (ARH 699) in the semester of graduation.

Plan II: Non-Thesis Track

Courses

Plan II students must complete 24 semester hours in art history.
For breadth of knowledge, students must take at least one Western and one non-Western course, and take courses in both modern and pre-modern time periods. A maximum of 3 semester hours of independent study will be permitted. Each student must take ARH 680 Methods and Approaches to the History of Art,which should be taken in the first semester of enrollment in the M.A. program, as well as ARH 652 Advanced Research Seminar, which should be taken in the final semester of coursework. Each student must take at least 6 semester hours of coursework at the University of Alabama (Tuscaloosa).

It is recommended that Plan II students take ARH 585 Special Topics: Museum Studies as one of their art history electives in the first 24 hours of coursework.

* Note: A maximum of 6 of the required hours in art history may be taken in a related field with the concurrence of the joint faculty.

Foreign Language Requirement

By the completion of 15 hours of coursework towards the M.A., students should have met the language requirement of a reading knowledge of one foreign language relevant to the student's area of study, approved by the Graduate Program Director and Faculty Advisor. Students may demonstrate language competency by passing a translation exam administered by the Department of Foreign Languages (French or German) or by attaining at minimum a B in a 200-level course (e.g. FR 201 or FR 202 or GN 201 or GN 202). For other languages, students must consult with the Graduate Program Director and Faculty Advisor and arrange an appropriate translation exam or course to fulfill the language requirement. Students may not enroll in ARH 652 until the language requirement is completed. A reading knowledge of a second foreign language is strongly recommended. Students may not advance to candidacy until the language requirement is completed.

Final Coursework and Capstone Presentation to Faculty

The final two courses (6 hours) are geared toward professional study:
3 hours: ARH 592 Museum/Gallery Internship or ARH 598 AEIVA Internship
3 hours: ARH 585 Special Topics Museum Studies* or ARH 698 Independent Studies or MPA 600 Administrative Ethics or MPA 602

Scope of Public Administration or MPA 671 Marketing and Fundraising or MPA 672 Nonprofit Management or MPA 684 Grants Management

The specific courses will be determined by the Graduate Program Director in consultation with the student.

Upon the successful completion of their coursework, Plan II students will make a capstone presentation to the faculty (summary and analysis of major project undertaken as part of internship or other professional or practicum-based class). This presentation should be completed by the last day of the classes in the student's final semester, before the start of final exam week.

* ARH 585 may be repeated once for credit.

UAB Faculty:

Cummings, Cathleen
Dallow, Jessica
Turel, Noa

UA-Tuscaloosa Faculty:

Castenell, Wendy
Curzon, Lucy
Feltman, Jennifer
Jones, Tanja
Stephens, Rachel
Sung, Doris

Additional Information

Deadline for Entry Term(s):	Fall or Spring Semester
Deadline for All Application Materials to be in the Graduate School Office:	April 1 for Fall, October 1 for Spring
Number of Evaluation Forms Required:	Three
Entrance Tests:	GRE (TOEFL and TWE also required for international applications whose native language is not English.)
Additional Requirements:	Students must provide a writing sample

Contact Information

For detailed information, contact Dr. Noa Turel, Graduate Program Director, UAB Department of Art and Art History:

Telephone 205-934-8973; Fax (205) 996-6986.
E-mail **nturel@uab.edu (cathleen@uab.edu)**

Prospective students should use this checklist to obtain specific admissions requirements on how to apply to Graduate School.

Master of Arts in Art History

Plan I: Thesis Track

Requirements		Hours
ARH 680	Methods and Approaches to the History of Art	3
Select courses from two of the six areas		21
Medieval Art		
ARH 507	The Art of Rome	
ARH 519	Arts of Death in the Middle Ages	
Early Modern Art		
ARH 507	The Art of Rome	
ARH 521	Italian Renaissance Art	
ARH 522	The Birth of Painting: Portable Pictures Across Renaissance Europe	
ARH 523	Study Abroad: European Art	
ARH 524	Northern Renaissance Art	
ARH 530	Eighteenth-Century Art in Europe	
ARH 531	European Painting in the Seventeenth Century	
ARH 535	Arts of Power in Early Modern Europe	
ARH 581	Special Topics: Early Modern Art	
ARH 583	Special Topics: Gender and the Visual Arts	
ARH 595	Seminar: Early Modern Art	
ARH 630	Seminar: Early Modern Art	
Eighteenth-Century/Nineteenth-Century Art		
ARH 540	Nineteenth Century Art I: Neoclassicism, Romanticism, and Realism	
ARH 541	Nineteenth-Century Art II: Impressionism and Post-Impressionism	
ARH 550	American Art to 1900	
ARH 582	Special Topics: Modern Art	
ARH 596	Seminar: Modern Art	
ARH 640	Seminar: Modern Art	
Twentieth-Century/Contemporary Art		
ARH 560	Twentieth Century Art to 1945	
ARH 561	Modern Design	
ARH 564	Art Since 1945	
ARH 565	Aspects of Contemporary Art	
ARH 567	Modern Architecture	
ARH 568	Race and Representation	
ARH 584	Special Topics: Contemporary Art	
ARH 585	Special Topics: Museum Studies	
ARH 598	AEIVA Internship	
ARH 660	Seminar: Contemporary Art	
East Asian Art		
ARH 570	Tomb Art in East Asia	
ARH 573	Japanese Prints and Printmakers	
ARH 574	Landscape and Image in East Asia	
ARH 575	Japanese Art	
ARH 578	Buddhist Arts of East Asia	
ARH 588	Special Topics: East Asian Art	
ARH 594	Seminar: East Asian Art	
South Asian Art		
ARH 571	Topics in Asian Cinema	
ARH 572	Buddhist & Hindu Art in India to 1200	
ARH 577	Piety and Power: Art in India after 1200	
ARH 579	Study Abroad: Art and Culture of South Asia	
ARH 586	Special Topics: South Asian Art	
Foreign Language Competency [1]		
Comprehensive Examination		
Admission to Candidacy [2]		
Thesis [3]		
ARH 699	Thesis Research	6
Total Hours		**30**

[1] Demonstrate language competency by passing a translation exam. French & German studies must pass FR 201, FR 202 or GN 201, GN 202. Students must consult with the Graduate Program Director and Faculty Advisor.

[2] For admission to candidacy, the student must pass a comprehensive examination.

[3] Students must present a thesis. Each student will complete 6 hours of ARH 699 and be registered for at least 3 credits in ARH 699 in the semester of graduation.

Plan II: Non-Thesis Track

Requirements		Hours
ARH 680	Methods and Approaches to the History of Art	3
Select courses from two of the six areas		21
Medieval Art		
ARH 507	The Art of Rome	
ARH 519	Arts of Death in the Middle Ages	
Early Modern Art		
ARH 507	The Art of Rome	
ARH 521	Italian Renaissance Art	
ARH 522	The Birth of Painting: Portable Pictures Across Renaissance Europe	
ARH 523	Study Abroad: European Art	
ARH 524	Northern Renaissance Art	
ARH 530	Eighteenth-Century Art in Europe	
ARH 531	European Painting in the Seventeenth Century	
ARH 535	Arts of Power in Early Modern Europe	
ARH 581	Special Topics: Early Modern Art	
ARH 583	Special Topics: Gender and the Visual Arts	
ARH 595	Seminar: Early Modern Art	
ARH 630	Seminar: Early Modern Art	
Eighteenth-Century/Nineteenth-Century Art		
ARH 540	Nineteenth Century Art I: Neoclassicism, Romanticism, and Realism	
ARH 541	Nineteenth-Century Art II: Impressionism and Post-Impressionism	
ARH 550	American Art to 1900	
ARH 582	Special Topics: Modern Art	
ARH 596	Seminar: Modern Art	
ARH 640	Seminar: Modern Art	
Twentieth-Century/Contemporary Art		
ARH 560	Twentieth Century Art to 1945	
ARH 561	Modern Design	
ARH 564	Art Since 1945	
ARH 565	Aspects of Contemporary Art	
ARH 567	Modern Architecture	
ARH 568	Race and Representation	
ARH 584	Special Topics: Contemporary Art	
ARH 585	Special Topics: Museum Studies	
ARH 598	AEIVA Internship	
ARH 660	Seminar: Contemporary Art	
East Asian Art		
ARH 570	Tomb Art in East Asia	
ARH 573	Japanese Prints and Printmakers	
ARH 574	Landscape and Image in East Asia	
ARH 575	Japanese Art	
ARH 578	Buddhist Arts of East Asia	
ARH 588	Special Topics: East Asian Art	
ARH 594	Seminar: East Asian Art	
South Asian Art		
ARH 571	Topics in Asian Cinema	
ARH 572	Buddhist & Hindu Art in India to 1200	
ARH 577	Piety and Power: Art in India after 1200	
ARH 579	Study Abroad: Art and Culture of South Asia	
ARH 586	Special Topics: South Asian Art	
Foreign Language Competency [1]		
Comprehensive Examination		
Capstone Presentation & Internship		**3**
ARH 592	Museum/Gallery Internship	
ARH 598	AEIVA Internship	
Professional Coursework		**3**
ARH 585	Special Topics: Museum Studies [2]	
ARH 698	Independent Studies	
MPA 600	Administrative Ethics	
MPA 602	Scope of Public Administration	
MPA 671	Marketing and Fundraising	
MPA 672	Nonprofit Management	
MPA 684	Grants Management	
Capstone Presentation [3]		
Total Hours		**30**

[1] Demonstrate language competency by passing a translation exam. French & German studies must pass FR 201, FR 202 or GN 201, GN 202. Students must consult with the Graduate Program Director and Faculty Advisor.

[2] ARH 585 may be repeated once for credit.

[3] Students must make a capstone presentation to faculty (summary and analysis of major project undertaken as part of internship or other professional or practicum-based class).

M.A. in Cultural Heritage Studies with a Cultural Heritage Studies Track

Requirements		Hours
Required Coursework		
ARH 650	Issues in Cultural Heritage Policy and Practice (Plan to take in the first semester in the program.)	3
MPA 601	The Public Policymaking Process (Plan to take in the first semester in the program.)	3
MPA 600	Administrative Ethics	3
MPA 602	Scope of Public Administration	3
ARH 591	Capstone Internship: Experience and Presentation (Plan to take in the second year of program)	3
Anthropology Electives		
Select three from:		9
ANTH 515	Peace through Global Governance	
ANTH 519	Religion, Reconciliation, & Forgiveness	
ANTH 650	Nationalism Ethnicity and Violence	
ANTH 667	Museum Studies	
ANTH 521	Technological Monitoring of Cultural Resources, Human Rights and Conflict	
ANTH 526	NAGPRA, Repatriation, and Indigenous Rights	
ANTH 531	Memory and Memorialization	
ANTH 624	The Law of Historical and Cultural Resources	
ANTH 627	Archaeological Laboratory Methods	

ANTH 634	Observing the Earth from Space	
ANTH 637	Real World Remote Sensing App	
Art History Elective [1]		**3**
Elective [2]		**3**
Total Hours		**30**

[1] Select one Art History Elective from the following ARH 519, ARH 521, ARH 522 , ARH 524, ARH 530, ARH 531, ARH 535, ARH 540, ARH 541, ARH 550, ARH 560, ARH 564, ARH 567, ARH 568, ARH 570, ARH 573, ARH 574, ARH 572, ARH 575, ARH 577.

[2] Select one elective from the graduate Art History (ARH), graduate Anthropology (ANTH), or graduate Public Administration (MPA) courses.

Cultural Heritage Studies with a Cultural Heritage Administration Track

Requirements		Hours
Required Coursework		
ARH 650	Issues in Cultural Heritage Policy and Practice	3
MPA 601	The Public Policymaking Process	3
MPA 602	Scope of Public Administration	3
MPA 604	Human Resources Management	3
ARH 591	Capstone Internship: Experience and Presentation	3
ANTH 667	Museum Studies	3
Public Administration Electives		
Select two from the following:		6
MPA 600	Administrative Ethics	
MPA 671	Marketing and Fundraising	
MPA 672	Nonprofit Management	
MPA 678	Strategic Planning	
MPA 686	Data Management	
Art History Electives [1]		**6**
Total Hours		**30**

[1] Select two Art History graduate courses from the following: ARH 519, ARH 521, ARH 522, ARH 524, ARH 530, ARH 531, ARH 535, ARH 540, ARH 541, ARH 550, ARH 560, ARH 564, ARH 567, ARH 568, ARH 570, ARH 573, ARH 574, ARH 572, ARH 575, ARH 577.

Courses

ARH 505. Special Topics in African Art. 3 Hours.
Special topics in the history of African art and visual culture. Subject will vary with each offering.

ARH 507. The Art of Rome. 3 Hours.
Covers Ancient Rome, but focuses on Medieval through early Baroque painting, sculpture, and architecture. Examines the city of Rome over time. Also considers the impact of the papacy on the city and its use of ancient Roman models.

ARH 519. Arts of Death in the Middle Ages. 3 Hours.
The visual culture of death and the afterlife from the Roman catacombs to cadaver tombs, 300-1500.

ARH 521. Graduate Research in Italian Renaissance Art. 3 Hours.
The visual arts of the Italian Renaissance (1300-1550) in their historic context.

ARH 522. The Invention of Painting in Renaissance Europe. 3 Hours.
The emergence of modern easel painting, 1300-1600.

ARH 523. Study Abroad: European Art. 3 Hours.
On-site study of art and architecture in Europe.

ARH 524. Graduate Research in Northern Renaissance Art. 3 Hours.
The visual arts of the Northern Renaissance (1300-1600) in their historic context.

ARH 530. Eighteenth-Century Art in Europe. 3 Hours.
Visual culture in eighteenth-century Britain and France including study of eighteenth-century holdings in the Birmingham Museum of Art.

ARH 531. Graduate Research in Seventeenth Century European Painting. 3 Hours.
Painting in Europe from Italian and Spanish Baroque through the Dutch Golden Age.

ARH 535. Arts of Power in Early Modern Europe. 3 Hours.
The visual arts in service of kings, popes, and the people, 1300-1700.

ARH 540. Graduate Research in Nineteenth Century Art I: Neoclassicism, Romanticism, and Realism. 3 Hours.
Painting, sculpture, and graphic arts in Europe, 1780-1850.

ARH 541. Graduate research in Nineteenth-Century Art II: Impressionism and Post-Impressionism. 3 Hours.
Painting, sculpture,and graphic arts in Europe,1860-1900.

ARH 550. Graduate Research in American Art and Material Culture. 3 Hours.
Painting, sculpture, and architecture in the U.S., with an emphasis on 19th century.

ARH 560. Graduate Research in Twentieth Century Art to 1945. 3 Hours.
Painting, sculpture, and architecture in Europe and the United States, 1900-1945.

ARH 561. Graduate Research in Modern Design. 3 Hours.
History of modern design. Will examine various design disciplines, design theory, well as the relationships between design, fine art, architecture and popular culture.

ARH 564. Graduate Research in Art Since 1945. 3 Hours.
Painting, sculpture, and architecture, primarily in the United States, 1945 to the present.

ARH 565. Aspects of Contemporary Art. 3 Hours.
Topics in contemporary art, ca. 1970 to the present. Course offerings will vary from year to year and will study a specific historical moment, medium, theme, or subject. Prerequisite: ARH 204 or permission of instructor.

ARH 567. Graduate Research in Modern Architecture. 3 Hours.
History of modern architecture, covering examples from the late 18th century to the present and emphasizing the United States.

ARH 568. Graduate Research in Race and Representation. 3 Hours.
History of 20th-century African American art in context of contemporary theories of identity and in relation to African art. Includes study of objects in the Birmingham Museum of Art.

ARH 570. Graduate Research in Arts of the Afterlife in East Asia to ca. 1300. 3 Hours.
What is the purpose of a tomb? How do its structure and décor convey ancient perceptions of death? Who are the occupants, and how did they envision their journey into the afterlife? This course is a survey of the funerary arts of China, Korea, and Japan. By investigating tombs, shrines, sarcophagi, wall paintings, and grave goods throughout East Asia, we will gain a deeper understanding of ancient religions, social structures, ethnic identities, and cross-cultural interactions. Lectures will be supplemented by several visits to the Museum's Asian collections.

ARH 571. Topics in Asian Cinema. 3 Hours.
This course offers students an introduction to a vital aspect of contemporary Asian culture, recognizing that film can be an important focus of contemporary cultural commentary and critique. The course presumes no prior knowledge of Asia or cinema and its artistic tradition. The goal of the course is to view and discuss, as a class, approximately ten films, emphasizing an understanding of their cultural background and an appreciation of their aesthetic merits as films and cultural settings in Asia. Attendance at weekly screenings is mandatory.

ARH 572. Graduate Research in Art in India to 1200. 3 Hours.
This course explores the environments of worship and devotion particular to India’s major indigenous religious traditions, from their earliest expressions in approximately the fifth century BCE through to the arrival of Islam in India, ca. 1200. We will examine aesthetic conventions, religious ideals, and urban cultures by focusing on the sculpture and architecture traditions of Hinduism, Buddhism, and Jainism.

ARH 573. Graduate Research in Japanese Prints and Printmakers. 3 Hours.
History of Japanese wood-block prints and printmakers from the seventeenth through the twentieth centuries.

ARH 574. Graduate Research in Landscape and Image in East Asia. 3 Hours.
This course surveys the major traditions of landscape art in East Asia. We will explore the ways in which places and spaces are transformed into famous places and sacred sites and consider the critical role played by visual representation in this process. Major topics include the relationship between landscape and power,cultural memory, literature, mythology, seasonality, travel, and literati culture. We will examine the functions of landscape art in various cultural, geographical, and temporal contexts of East Asia. We will look at landscape painting in China from the Tang through the Ming dynasties and consider the complex processes of cultural dissemination and adaptation by looking at the reception of Chinese landscape painting tradition in Korea and Japan.

ARH 575. Graduate Research in Japanese Art. 3 Hours.
Art and culture of Neolithic era through Nineteenth century.

ARH 576. Advanced Study: Mughal Art and Architecture India, 1526-1707. 3 Hours.
This course will explore the production of art and architecture during the reigns of the Imperial Mughals, that is, first six Mughal emperors of India (1526-1707). Aside from its cultural splendor, political might, and booming economy, Mughal India is also important for the many ways in which it shaped South Asia's development in subsequent centuries. During this period, India’s Mughal rulers established their presence across the subcontinent through the building of residential palaces, tombs, pleasure gardens, and mosques. The Mughal emperors of India also established court-appointed schools of painting that contributed to the development of royal portraiture and the circulation of religious and secular texts. As many of the artistic expressions that we will be concerned with in this class were created to serve both political and devotional functions, we will also be studying socio-religious aspects of Islam and Hinduism within India. Special attention will be paid to articulations of space, patronage, and the relationships between art, the royal courts, and religion.

ARH 577. Graduate Research in Piety and Power: Art in India after 1200. 3 Hours.
This course looks at the arts of India after 1200, when Indian art and culture was increasingly influenced and altered by religious and secular powers from outside the subcontinent. We will examine Islamic art and architecture under the patronage of various Sultanate traditions, and finally the Mughals, who expressed their power and piety in monumental architecture and extensively illustrated books. We will also consider the influence of Europeans in South Asia, culminating with the colonial project of the British Raj. Ongoing negotiations between these newly-arriving groups and Indians older, indigenous traditions will be studied. Throughout the course we will dissect the categories of knowledge about South Asia and its art that were constructed primarily by the British, considering, for example, the usefulness of dividing India’s art history into categories of “Hindu,” “Islamic,” “European,” and etc.

ARH 578. Buddhist Arts of East Asia. 3 Hours.
Survey of art and architecture created for Buddhist religious purposes in China, Japan, and to a lesser extent Korea and Central Asia. The course will include a brief overview of Buddhist monuments in South Asia, study of the iconography of Buddhist images in graphic and sculptural media, and analysis of a variety of Buddhist styles in painting, sculpture, and architecture.

ARH 579. Study Abroad: Art and Culture of South Asia. 3 Hours.
This course allows students to become immersed in the art and culture of Asia through direct experience in the field. Focus will be primarily on South Asia but may vary with each course offering to include Nepal, Tibet, and Southeast Asia. Preliminary lectures in Birmingham and significant written assignments required.

ARH 580. Art Criticism and Theory. 3 Hours.
A topics course on subjects in art criticism and theory. The specific focus will vary by instructor and may emphasize either non-Western or Western theories, criticisms, and approaches.

ARH 581. Special Topics: Early Modern Art. 3 Hours.
Special topics in the arts of the Early Modern period in the Western Art tradition. Subject will vary with each offering.

ARH 582. Special Topics: Modern Art. 3 Hours.
A special topics course on subjects in the Modern period in the Western tradition, beginning in the later eighteenth century. Specific course topics will vary by semester.

ARH 583. Special Topics: Gender and the Visual Arts. 3 Hours.
Topic will vary, depending on instructor. This course will address ways in which gender has affected the history of artistic practice and patronage. It will consider such issues as the gendering of pictorial practice and space, strategies of representing gendered subjects, and the impact of women as patrons of art and architecture.

ARH 584. Special Topics: Contemporary Art. 3 Hours.
Special topics in the arts of the Contemporary period in the Western art tradition. Subject will vary with each offering.

ARH 585. Special Topics: Museum Studies. 3 Hours.
Museum operation; organization and preparation of exhibitions; cataloging objects in collection; experience with UAB Institute of Visual Art and Birmingham Museum of Art.

ARH 586. Special Topics: South Asian Art. 3 Hours.
Special topics in the arts of South Asia. Subject will vary with each offering.

ARH 587. Special Topics: Field Study. 3 Hours.
Trips to prominent museums and galleries in United States. Preliminary lectures in Birmingham and significant written assignments required.

ARH 588. Special Topics: East Asian Art. 3 Hours.
Special topics in the arts of East Asia. Subject will vary with each offering.

ARH 590. Art Theory: Special Topics. 3 Hours.
Topics in art theory will vary with each offering.

ARH 591. Capstone Internship: Experience and Presentation. 3 Hours.
This is a practical internship with a Cultural Heritage organization. The Internship Practicum is where a graduate student participates in practical and general training experiences in the workplace, under the direction of on an external field supervisor in conjunction with the university instructor. It is intended to give the student an opportunity to apply theory, expand knowledge, and gain experience in a cultural heritage or cognate organization (museum, gallery, library or archive, commercial or non-profit conservation or preservation facility, research facility, governmental or political agency, law firm, etc). The student will ordinarily be expected to spend between 10-15 hours per week on location for each three hours of credit.

ARH 592. Museum/Gallery Internship. 3 Hours.
Through active participation in the daily operations of a museum, gallery, or art space, students will acquire direct working knowledge of cooperating art institution. Students will be required to work at the institution a minimum of 10 supervised hours per week during the term. Permission of instructor required. May be repeated to a maximum of 6 semester hours.

ARH 593. Seminar: South Asian Art. 3 Hours.
Seminar in the arts of South Asia. Subject will vary with each offering.

ARH 594. Seminar: East Asian Art. 3 Hours.
Seminar in the arts of East Asia. Subject will vary with each offering.

ARH 595. Seminar: Early Modern Art. 3 Hours.
Seminar in Early Modern Art. Research seminar focused on topics in the visual arts of Europe and its colonies 1300-1750. Subject will vary with each offering.

ARH 596. Seminar: Modern Art. 3 Hours.
Seminar in Modern Art. Subject will vary with each offering.

ARH 597. Seminar: Contemporary Art. 3 Hours.
Seminar in Contemporary Art. Subjects will vary with each offering.

ARH 598. AEIVA Internship. 3 Hours.
The AEIVA Intern Team will participate in all phases of daily gallery operations, ranging from curatorial practices, exhibition design, video/photographic documentation and production, technical and analytical writing, graphic design, etc. This team will act as a support staff for the AEIVA curatorial/ administrative staff in a hands-on museum/gallery work environment. May be repeated to a maximum of 6 semester hours.

ARH 600. Methods and Approaches to the History of Art. 3 Hours.
This literature-intensive course covers the historiography of the field and a range of theoretical approaches. Should be taken in the first semester of enrollment in the M.A. program.

ARH 630. Seminar: Early Modern Art. 3 Hours.
Seminar in Early Modern Art.

ARH 640. Seminar: Modern Art. 3 Hours.
Seminar in Modern Art.

ARH 650. Issues in Cultural Heritage Policy and Practice. 3 Hours.
This seminar course considers a series of issues centered around the core question, “who owns the past?” Exploring constructs of cultural heritage/cultural property and the museum, we will examine ideas about art objects, especially “antiquities” of a sacred or religious nature, from multiple perspectives, including politics, public and international policy, law, economics and economic development, public custodianship, and heritage preservation.

ARH 652. Advanced Research Seminar. 3 Hours.
This advanced seminar focuses on the development and application of discipline-specific research skills. Students will broaden their knowledge of art historical methodologies and themes generally, as well as construct a research program specific to their field/area of study (Medieval, Early Modern, Modern/Contemporary, etc.).

ARH 660. Seminar: Contemporary Art. 3 Hours.
Seminar in Contemporary Art.

ARH 670. Seminar: South Asian Art. 3 Hours.
Seminar in South Asian Art.

ARH 680. Methods and Approaches to the History of Art. 3 Hours.
This literature-intensive course covers the historiography of the field and a range of theoretical approaches. Should be taken in the first semester of enrollment in the M.A. program.

ARH 698. Independent Studies. 1-6 Hour.
Independent Study Topics vary. Permission of instructor required.

ARH 699. Thesis Research. 1-6 Hour.
Thesis Research. Must be admitted to master level candidacy to take this course. At least 6 graduate credits needed for graduation.
Prerequisites: GAC M

Cultural Heritage Studies

The Master of Arts degree in Cultural Heritage Studies is the only graduate program of its kind in the state. The M.A. degree in Cultural Heritage Studies provides students with the theoretical background and practical skills necessary to enter a career in the emerging fields of cultural heritage practice, policy, and management. The program is interdisciplinary; in addition to core and elective courses in art history, students will take additional relevant classes in anthropology and public administration. The small size of the program affords graduate students the opportunity to work closely with individual faculty members in seminars and directed research projects.

Students in the M.A. in Cultural Heritage Studies program may select one of two study tracks: the Cultural Heritage track or the Cultural Heritage Administration track.

The **Cultural Heritage** track provides students with an in-depth understanding and analytical grasp of international cultural heritage, and cultural property protection and response, intersections of cultural heritage and aid; the geopolitics of heritage as diplomacy; the role of international structures on the conservation of world heritage, looting and willful destruction of historic sites and buildings, and a variety of related issues.

The **Cultural Heritage Administration** track provides students with an in-depth understanding and analytical grasp of public policy and advocacy, including aspects of museum studies relevant to the administration and management of not-for-profit museums, public arts policy, the management of public cultural activity, commercial and non-profit sides of the business of culture, including organizational structures and staff roles, the fundamentals and legal features of public administration and nonprofit management.

Program Details

The M.A. in Cultural Heritage Studies is a 30-hour degree. Students in both tracks enroll in 27 hours of course work, including the core course **ARH 650 Issues in Global Cultural Heritage Preservation: Practice & Policy** and 3 credit hours of a practicum or internship. Degree requirements include the completion of a final professional research project to ensure the student has achieved proficiency of the knowledge and skills expected of a professional in the discipline.

Graduates will obtain a broad foundation of knowledge applicable to careers and further study in historic preservation and museum studies; arts management and administration; cultural and public advocacy; art and cultural policy; law and transnational justice; international affairs, diplomacy, government, arts centers, government, museums, private arts agencies, arts councils, community arts programs, foreign service; peace and justice studies; art journalism; and other fields.

Admission Requirements

A minimum GPA of 3.0 (B) is required for acceptance into the program. The applicant should have completed 18 semester hours in related coursework such as art history, anthropology, history, political science, or museum studies, although this requirement may be waived depending on the applicant's background and preparation. Qualified applicants will be invited for a required personal interview, which may take place over Skype or similar. The committee will consider all applicant information to select students who will be offered program admission.

Plan of Study

- Cultural Heritage Studies Track
- Cultural Heritage Administration Track

- **Cultural Heritage Studies Track**

Year One

Fall:

- ARH 650: Issues in Global Cultural Heritage
- MPA 600: Administrative Ethics
- Anthropology Elective

Spring:

- MPA 601: The Public Policymaking Proces
- Anthropology Elective
- Art History Elective

Year Two

Fall:

- MPA 602: Scope of Public Administration
- Anthropology Elective
- Art History, Anthropology, or Public Administration Elective

Spring:

- ARH 591: Capstone Practicum

Application Due Dates

Students may apply for admission for either the fall or spring semester.

- **Fall 2020 admission:** applications due by August 1
- **Spring admission:** applications due by December 1

For more information about the M.A. in Cultural Heritage Studies, please contact Cathleen Cummings, Associate Professor and Graduate Program Director.

M.A. in Cultural Heritage Studies with a Cultural Heritage Studies Track

Requirements		Hours
Required Coursework		
ARH 650	Issues in Cultural Heritage Policy and Practice (Plan to take in the first semester in the program.)	3
MPA 601	The Public Policymaking Process (Plan to take in the first semester in the program.)	3
MPA 600	Administrative Ethics	3
MPA 602	Scope of Public Administration	3
ARH 591	Capstone Internship: Experience and Presentation (Plan to take in the second year of program)	3
Anthropology Electives		
Select three from:		9
ANTH 515	Peace through Global Governance	
ANTH 519	Religion, Reconciliation, & Forgiveness	
ANTH 650	Nationalism Ethnicity and Violence	
ANTH 667	Museum Studies	
ANTH 521	Technological Monitoring of Cultural Resources, Human Rights and Conflict	
ANTH 526	NAGPRA, Repatriation, and Indigenous Rights	
ANTH 531	Memory and Memorialization	
ANTH 624	The Law of Historical and Cultural Resources	
ANTH 627	Archaeological Laboratory Methods	
ANTH 634	Observing the Earth from Space	
ANTH 637	Real World Remote Sensing App	
Art History Elective [1]		**3**
Elective [2]		**3**
Total Hours		**30**

[1] Select one Art History Elective from the following ARH 519, ARH 521, ARH 522 , ARH 524, ARH 530, ARH 531, ARH 535, ARH 540,

ARH 541, ARH 550, ARH 560, ARH 564, ARH 567, ARH 568, ARH 570, ARH 573, ARH 574, ARH 572, ARH 575, ARH 577.

[2] Select one elective from the graduate Art History (ARH), graduate Anthropology (ANTH), or graduate Public Administration (MPA) courses.

Cultural Heritage Studies with a Cultural Heritage Administration Track

Requirements		Hours
Required Coursework		
ARH 650	Issues in Cultural Heritage Policy and Practice	3
MPA 601	The Public Policymaking Process	3
MPA 602	Scope of Public Administration	3
MPA 604	Human Resources Management	3
ARH 591	Capstone Internship: Experience and Presentation	3
ANTH 667	Museum Studies	3
Public Administration Electives		
Select two from the following:		6
MPA 600	Administrative Ethics	
MPA 671	Marketing and Fundraising	
MPA 672	Nonprofit Management	
MPA 678	Strategic Planning	
MPA 686	Data Management	
Art History Electives [1]		**6**
Total Hours		**30**

[1] Select two Art History graduate courses from the following: ARH 519, ARH 521, ARH 522, ARH 524, ARH 530, ARH 531, ARH 535, ARH 540, ARH 541, ARH 550, ARH 560, ARH 564, ARH 567, ARH 568, ARH 570, ARH 573, ARH 574, ARH 572, ARH 575, ARH 577.

Biology

To obtain specific admissions requirements on how to apply to Graduate School, prospective students should visit this page: https://www.uab.edu/cas/biology/graduate

Degree Offered	Ph.D., M.S., Fast Track M.S., Accelerated B.S./M.S.
Director:	Peggy R. Biga, Ph.D.
Phone:	(205) 934-9684
E-mail:	pegbiga@uab.edu
Website:	www.uab.edu/cas/biology/graduate

Program Information

Areas of Specialization

Graduate students in the M.S. and Ph.D. programs in biology may specialize in research activities at all levels of biological organization, with emphases on ecophysiology, cellular and molecular biology of plant and animal models, environmental microbiology, the biology of aging, bioinformatics, and ecology of aquatic organisms.

Admission

For admission in good standing, applicants must meet the following requirements, in addition to the Graduate School's standards: an undergraduate degree in biological science or a related field, B-level scholarship in all biology courses, two semesters of organic chemistry, two semesters of physics, mathematics through calculus, a *curriculum vitae*, a one-page statement of general research background and interests, and a personal statement of career goals. The GRE is optional. The graduate program director in biology must approve admission with deficiencies in one of the above requirements. Three letters of evaluation from individuals who have a thorough knowledge of the applicant's academic abilities and potential are also required. It is strongly recommended that a student contact a mentor before applying. Students may enter at the beginning of the Fall semester, with a **deadline of December 15 for all applicants**.

Coursework, Thesis, and Dissertation

A dissertation embodying the results and analysis of an original experimental investigation is required for Ph.D. candidates. Students in the M.S. program may write a thesis based on a research project (Plan I) or, alternatively, may elect to submit a nonresearch project incorporating a review and analysis of one or more topics of current or historical interest in biology (Plan II).

Since scientific problems encountered today are multifaceted and require multidisciplinary approaches, students are expected to acquire a broad background in the physical and life sciences. Doctoral students must complete formal course work in or have equivalent training related to five of the following nine areas: ecology, evolution, physiology, cell and/or molecular biology, developmental biology and embryology, genetics/molecular genetics, microbiology, organismal biology, and systems/computational biology and bioinformatics. Master's students must have competency in four of these life-science areas. Each student is also expected to satisfactorily complete a course in statistics and data modeling for biologists and any advanced courses designated by the student's graduate study committee consistent with the chosen area of specialization.

Each student must also enroll in three seminar or colloquium courses approved by his or her graduate study committee, and one of the seminars must be outside the student's primary area of specialization. Also, each student is required to demonstrate proficiency in teaching by delivering formal course lectures or by conducting instructional laboratories. Certificates for advanced training in teaching are also available.

Examinations

To qualify for candidacy, a student in the Plan I Master's program must satisfactorily complete either a written or an oral comprehensive examination. A doctoral student must take both written and oral comprehensive examinations. As part of a student's final defense of his or her dissertation or thesis, a public departmental seminar must be presented.

Class A Teaching Certification

Under the Alabama Department of Education's "Strengthened Subject Matter Option," students who complete the requirements for the master's degree in biology can also receive class A teaching certification, providing that certain prerequisites and requirements are met. Complete details are available from the School of Education Certification Office, Education and Engineering Complex, 1720 2nd Ave South, Birmingham, Alabama 35294-1250 (Telephone 205-934-5423).

Accelerated Learning Opportunities

Biology offers both a Fast-Track and Accelerated Bachelors/Masters (ABM) (p. 10) option for high-achieving undergraduate students. Deadlines to apply for admission: Summer - May 1, Fall - August 1, Spring - December 1. Students majoring is the sciences are eligible for the ABM program in Biology. Students pursuing a dual BS/MS in biology may specialize in research activities at all levels of biological organization, with opportunities to train in the biology of aging, climate change, food security, and aquatic sciences. Research activities range from cellular and molecular biology to endocrinology; genetics and genomic science to physiology; and epigenetics to population ecology. Graduates from this research-intensive program are prepared for careers in science and related fields, including research, teaching, biotechnology, science policy, medicine, conservation, and sustainability. Students in this program develop critical thinking, problem solving, and analytical skills preparing them for academic, government, non-profit or private sectors.

Both Thesis (Plan I) and Non-Thesis (Plan II) ABM programs are available, with both options including mentored research experience. Plan I students complete 10 credit hours of research (4 non-thesis; 6 thesis), while Plan II students complete 6 credit hours of non-thesis research. All ABM students complete 2 credit hours of colloquium/seminar/journal club and biology disciplinary coursework (Plan I - 12 credit hours; Plan II - 10 credit hours plus 12 credit hours of science electives). Plan I students complete 3 credit hours of statistics and 3 credit hours of Scientific Ethics.

The following courses are approved for shared credit for students pursuing an ABM in Biology: BY 501, BY 511, BY 512, BY 527, BY 530, BY 531, BY 535, BY 555, BY 567, BY 568, BY 569, BY 570, BY 605, BY 607, BY 614, BY 616, BY 618, BY 620, BY 626, BY 629, BY 633, BY 634, BY 636, BY 637, BY 640, BY 642, BY 644, BY 651, BY 655, BY 656, BY 656L, BY 668, BY 670, BY 674, BY 675, BY 680, BY 689, BY 696, GGSC 610, GGSC 615, GGSC 620, GGSC 635, GGSC 670, GGSC 690, GGSC 691, MIC 600, MIC 601, MIC 602, MIC 603, MIC 604, CNBY 610, CNBY 620, CNBY 630, CNBY 640, CNBY 660, CNBY 670, INFO 601, INFO 602, INFO 603, INFO 612, NBL 620, NBL 625, NBL 633, NBL 634, NBL 644, PY 620, PY 653, PY 687, PY 693.

Additional Information & Mailing Address

Deadline for Entry Terms:	Fall semester
Deadline for All Application Materials to be in the Graduate School Office:	December 15
Number of Evaluation Forms Required:	Three
Entrance Tests	TOEFL TWE, DuoLingo or IELTS are required for international applicants whose native language is not English.
Documents Required to Apply:	CV, 1-page research interests statement, 1-page career goals statement

Contact Information

For detailed information contact Dr. Peggy R. Biga, Graduate Program Director.
Telephone 205.934.9684
Fax 205.975.6097
E-mail **pegbiga@uab.edu** **(sawatts@uab.edu)**
Web https://www.uab.edu/cas/biology/graduate

Master of Science in Biology

Plan 1

Requirements		Hours
Biology Coursework [1]		**7**
Statistics Requirement		**3**
BY 655	Statistics and Modeling for Biologists	
Professional Training		**2**
GRD 715	Preparing TAs to Be Effective Teachers	
Seminar/Colloquium		**3**
BY 618	Colloquium in Biology of Aging	
BY 679	Colloquium in Evidenced Based Teaching	
BY 680	Epigenetics Discussion	
BY 681	Colloquium in Physiological Ecology	
BY 682	Colloquium in Immunology	
BY 684	Colloquium in Microbial Ecology	
BY 683	Colloquium in Physiology	
BY 685	Colloquium in Cell Biology	
BY 686	Colloquium in Mammalian Development	
BY 687	Colloquium in Endocrinology	
BY 688	Colloquium in Algal Ecophysiology	
BY 689	Colloquium in Genetics	
BY 690	Colloquium in Cellular Physiology	
BY 691	Colloquium in Botany	
BY 692	Colloquium in Ecology	
BY 693	Colloquium in Embryology	
BY 694	Colloquium in Microbiology	
Biology Dept. Seminar		**0**
BY 678	Biology Graduate Seminar (enrollment required every fall and spring semester while degree-earning student)	
Research		
BY 698	Nonthesis Research	9
BY 699	Thesis Research	6
Total Hours		**30**

[1] 7 credits of Biology courses from BY 501:597, 600:697

Plan 2

Requirements		Hours
Biology Coursework [1]		**10**
Other Science Related Coursework [2]		**6**
Statistics Requirement		**3**
BY 655	Statistics and Modeling for Biologists	
Professional Training		**2**
GRD 715	Preparing TAs to Be Effective Teachers	
Seminar/Colloquium		**3**
BY 618	Colloquium in Biology of Aging	
BY 679	Colloquium in Evidenced Based Teaching	
BY 680	Epigenetics Discussion	
BY 681	Colloquium in Physiological Ecology	
BY 682	Colloquium in Immunology	
BY 683	Colloquium in Physiology	
BY 684	Colloquium in Microbial Ecology	

BY 685	Colloquium in Cell Biology	
BY 686	Colloquium in Mammalian Development	
BY 687	Colloquium in Endocrinology	
BY 688	Colloquium in Algal Ecophysiology	
BY 689	Colloquium in Genetics	
BY 690	Colloquium in Cellular Physiology	
BY 691	Colloquium in Botany	
BY 692	Colloquium in Ecology	
BY 693	Colloquium in Embryology	
BY 694	Colloquium in Microbiology	
Biology Dept. Seminar		
BY 678	Biology Graduate Seminar (enrollment required every fall and spring semester while degree-earning student)	
Research		**6**
BY 698	Nonthesis Research	
Total Hours		**30**

1 Biology coursework selected from BY 501:697

2 Science Related Coursework selected from CH 500:597, CH 600:697, PH 500:597, PH 600:697, EPI 500:597, EPI 600:697, BST 500:597, BST 600:697, ENH 500: 597, ENH 600:697, GBS 500:597, GBS 600:697, GBSC 500:597, GPSC 600:697, GRD 717

PhD in Biology

Requirements		Hours
Statistics Requirement		**3**
BY 655	Statistics and Modeling for Biologists	
BY 755	Statistics and Modeling for Biologists	
BST 601	Biostatistics	
BST 611	Intermediate Statistical Analysis I	
Professional Training		**5**
GRD 715	Preparing TAs to Be Effective Teachers	
GRD 717	Principles of Scientific Integrity	
Additional Discipline Coursework [2]		**21-38**
Seminar/Colloquium [1]		**3**
BY 718	Colloquium in Biology of Aging	
BY 780	Epigenetics Discussion	
BY 781	Colloquium in Physiological Ecology	
BY 782	Colloquium in Immunology	
BY 783	Colloquium in Physiology	
BY 784	Colloquium in Microbial Ecology	
BY 785	Colloquium in Cell Biology	
BY 786	Colloquium in Mammalian Development	
BY 787	Colloquium in Endocrinology	
BY 788	Colloquium in Algal Ecophysiology	
BY 789	Colloquium in Genetics	
BY 790	Colloquium in Cellular Physiology	
BY 791	Colloquium in Botany	
BY 792	Colloquium in Ecology	
BY 793	Colloquium in Embryology	
BY 794	Colloquium in Microbiology	
Biology Department Seminar		
BY 678	Biology Graduate Seminar (enrollment required every fall and spring semester while degree-earning student)	
Research		**6-16**
BY 798	Nondissertation Research	
Dissertation Research		**12-24**
BY 799	Dissertation Research	
Total Hours		**72**

1 Seminars from BY 681:695, BY 781:795, GBS 737, GBS 777, GBS 792, GBSC 701, NTR 690, NTR 728, NTR 788, NTR 789

2 Discipline Coursework from: **BY** 500:697, 700:797, **CH** 600:697, 700:797, **PH** 600:697, 700:797, **EPI** 600:697, 700:797, **BST** 600:697, 700:797, **ENH** 600:697, 700:797, **GBS** 600:697, 700:797, **GBSC** 600:697, 700:797, **GRD** 600:697, 701:713, 716, 719:797, **NTR** 600:697, 700:797

Graduate Certificate in Science Policy

The Science Policy Graduate Certificate program is aimed at training students to solve key societal problems using science and innovation. This program will train students in scientific fields to learn about the policy making process & ethical technology development, while training students in non-scientific fields about contemporary science as they pertain to policy needs. Trainees will develop key core competencies that link science and society together making them valuable resources to academic, public, and private job sectors. The program will focus on effective science communication, the impact and processes of establishing policies, and the real time assessment of innovations for society at local, national, and global level. Participants will gain essential skills to be applied in solving real world problems and develop leadership skills through the science policy community of practice. The certificate is geared to trainees from diverse programs including, but not exhaustively, biology, chemistry, physics, sociology, public health, biomedicine, public administration, political science, communications, and computer science.

Application for the Certificate Program

To complete the Graduate Certificate in Science Policy, students must be admitted as a graduate student as defined by the UAB Graduate School. These requirements include an earned undergraduate degree from an accredited institution. Prospective students must also complete the application form and submit it to the Graduate Program Director (pegbiga@uab.edu) prior to the application deadline.

Courses

Students must obtain a grade of at least B in any course used to satisfy the certificate requirements. 12 of the 15 required credit hours must be earned at UAB, and 12 of the credits must be at or above 600-level.

Graduate Certificate in Science Policy [1,2,3]

Requirements		Hours
Core Course Requirement		**3**
BY 617	Science Policy	
or MPA 61	Science Policy	
Foundational Knowledge Skills		**3**
BY 647	Contemporary Political Issues in Science	
or MPA 64	Contemporary Political Issues in Science	
MPA 601	The Public Policymaking Process	
MPA 602	Scope of Public Administration	
MPA 604	Human Resources Management	
SOC 620	Public Sociology	
MPA 682	Economic Development	
Humanistic Knowledge Skills		**3**
MPA 600	Administrative Ethics	

SOC 626	Applied Sociology	
SOC 627	Applied Social Psychology	
SOC 645	Sociological Practice	
HA 616	Biomedical Ethics	
ANTH 524	Transitional Justice and Human Rights	
ANTH 641	Anthropology of Human Rights	
ANTH 624	The Law of Historical and Cultural Resources	
PY 619	Diversity, Equity and Inclusion in Research and the Workplace	
PY 734	Applied Developmental Psychology	
Meta Knowledge Skills		**3**
SOC 715	Program Evaluation	
SOC 770	Techniques of Population Analysis	
SOC 772	Medical Demography	
MPA 689	Program Evaluation	
MPA 605	Information Management for Government	
MPA 603	Public & Nonprofit Budgeting	
BY 670	Scientific Communication	
or BY 770	Scientific Communication	
CM 604	Analysis of Communication Audiences	
CM 605	Communication Effects	
CM 616	Health Communication	
CM 620	Persuasion	
PY 718	Advanced Research Design	
ANTH 521	Technological Monitoring of Cultural Resources, Human Rights and Conflict	
Capstone		**3**
BY 677	Design Thinking to Solve Problems through Science Policy	
Total Hours		**15**

[1] The student must obtain a grade of at least a B in any course used to satisfy the certificate requirements

[2] 12 of the 15 required credit hours must be earned at UAB

[3] 12 of the credits must be at or above the 600-level

BY-Biology Courses

BY 501. Advanced Genetics for Teachers. 4 Hours.
Explore the basic and advanced concepts of genetics, including the principles and mechanisms of inheritance, gene structure, function, and regulation, along with the application of molecular genetic technology in fields such as human health and agriculture. This course provides a strong foundation for advanced biology studies. Additionally, students will actively participate in practical experimentation, where they will explore into the fundamental and advanced principles of genetics, molecular biology, and genomics through a combination of lectures and laboratory work.

BY 501L. Advanced Genetics for Teachers Laboratory. 0 Hours.
Advanced Genetics for Teachers Lab required with BY 501 lecture.

BY 502. Botany for Teachers. 3 Hours.
Provides understanding of human structural and functional relationships essential in modern biology. Corequisite: BY 503.

BY 503. Advanced Biology for Teachers III. 1 Hour.
Laboratory supplementing lecture (BY 502) through use of human specimens, models, and demonstrations.

BY 504. Life Science for Middle School Teachers. 3 Hours.
Life Science for Middle School Teachers.

BY 507. Microbial Ecology. 3 Hours.
Microorganisms in nature; interactions with each other and with environment. Independent project required. Prerequisite: BY 271.

BY 511. Molecular Genetics. 3 Hours.
Prokaryotic and eukaryotic gene structure and function. Independent project required.
Prerequisites: BY 210 [Min Grade: D] and BY 330 [Min Grade: D] and CH 234 [Min Grade: D]

BY 512. 21st Century Gene Editing. 3 Hours.
The course will cover basic concepts of molecular genetics, including an introduction to the DNA biology (structure and function), the use of model organisms and experimental approaches for molecular genetic analysis and an understanding of human genetic disorders and possible genetic therapies. The first part of the course, while dealing with introductory material through lectures and discussions, will give students a hands-on experience with well-known molecular techniques like DNA isolation and polymerase chain reaction (PCR), and how these techniques are used in the context of gene editing. The participants will also have direct exposure to working with zebrafish (Danio rerio) embryos (<3 days old, therefore exempt from detailed IACUC regulations) and roundworms (C. elegans) as an alternate model system to use the CRISPR-Cas9 technology. These broadly applicable techniques will be reiterated in the second part of the course with a special emphasis on the CRISPR-Cas9 technology. The activities involved in these two parts will provide an opportunity for rich pedagogical discussion on fundamental concepts in biology, chemistry, the process of scientific experimentation, and the nature of evidence. In-service teachers will learn how to design and implement a meaningful high school lesson module on the CRISPR-Cas9 technology and complete formative and summative assessment for that module.

BY 515. Human Anatomy for Educators. 4 Hours.
Principles of vertebrate structure with emphasis on gross and microscopic human anatomy. Survey of human embryology and evolution. Lecture and laboratory.Graduate project/presentation required.

BY 515L. Human Anatomy for Educators - Laboratory. 0 Hours.
Principles of vertebrate structure with emphasis on gross and microscopic human anatomy. Survey of human embryology and evolution. Lecture and laboratory. Course is targeted to current and future Human Anatomy educators.

BY 527. Histology. 4 Hours.
Microscopic anatomy of cells, tissues, and organs of animals; correlation of structure and function. Techniques and methodology. Lecture and laboratory. Completion of additional independent project required for graduate credit.

BY 527L. Histology Laboratory. 0 Hours.
Histology Lab required with BY 527 lecture.

BY 530. Graduate Cell Biology. 3 Hours.
This course will introduce students to key concepts of cell biology with a focus on cellular components, cell metabolism, cell organization, molecular dogma, cellular trafficking, cell cycle, cell signaling, cancer and stem cells. Classical cell biology will be discussed in historical perspectives. Current techniques used in the study of cell biology will be discussed in the appropriate sections. The course is divided into three modules: weeks 1-6, weeks 7-11, and weeks 12-15. 3 Credit Hours. Graduate Project required.

BY 531. Advanced Recombinant DNA Technology. 3 Hours.
Manipulation of genes and their regulations, and techniques used in recombinant DNA technology. Independent project required. Prerequisites: BY 311, BY 330, CH 233 and CH 460 or 461.

BY 535. Natural History of Vertebrates. 4 Hours.
Adaptations of vertebrates for survival in particular environments. Survey and classification of local vertebrates. Two lectures, one laboratory or field trip per week. Independent project required.

BY 535L. Natural History of the Vertebrates Lab. 0 Hours.
Lab must be taken with BY 535 lecture.

BY 555. Biological Data Interpretation and Analysis. 3 Hours.
The course covers the basics of scientific investigation with an emphasis on understanding methods of the scientific process, experimental design, data analysis and data interpretation, and graphical presentation, and scientific writing. Special emphasis will be placed on the use of data management and the understanding of statistical packages language to address the most common types of data analyses used to investigate specific applications in biology. Quantitative Literacy is a significant component of this course. Recommend course is taken during the first year of graduate education.

BY 560. Advanced Invertebrate Zoology. 3 Hours.
Selected topics. Lecture and student projects. Prerequisite: BY 255.

BY 567. Tropical Ecology. 3 Hours.
An overview of the major tropical ecotypes with emphasis on ecology of terrestrial, aquatic, and marine tropical organisms. Major portion of course taught at a tropical field station in the Caribbean. Lectures, laboratory, and field trips. Library research paper required. Prerequisites: Graduate Standing and Permission of Instructor.

BY 568. Galapagos Ecology. 3 Hours.
The ecology of the Galapagos Islands, with an emphasis on terrestrial & marine organisms. Major portion conducted on the Galapagos Islands. Lecture & field trips. Library research paper required. Prerequisites: Graduate Standing and Permission of Instructor.
Prerequisites: BY 255 [Min Grade: D] or BY 256 [Min Grade: D] or BY 470 [Min Grade: D]

BY 569. Rain Forest Ecology. 3 Hours.
Overview of physical and environmental factors that structure the rainforest, biodiversity of life, and interactions of its organisms. A survey of prominent biota will be conducted. Major portion of course taught in Costa Rica. Lectures and field trips. Library research paper required. Prerequisites: Graduate Standing and Permission of Instructor.

BY 570. Ecology. 3 Hours.
The study of interactions between organisms and their environment. An introduction to ecological processes at individual, population, community, and ecosystem levels and their relevance to current environmental problems Lectures. Independent project required. Prerequisite: Graduate Standing.

BY 585. Northern Field Studies. 3 Hours.
Ecology of northern coniferous forest and tundra ecosystems. Major portion of course taught on site in Alaska. Lecture and field trips. Graduate project/paper required. 3 hours. (Irregular offering).

BY 595. Special Topics in Biology I. 1-4 Hour.
This course will consider graduate-level topics from the various disciplines in the biological sciences and the topics will differ each term. Course requirements may include lecture, laboratory, readings, discussion, reporting, and internships or fieldwork, which may be conducted on- or off-campus as well as online. May be taken more than once for credit.

BY 596. Special Topics in Biology II. 0-4 Hours.
This course will consider advanced graduate-level topics from the various disciplines in the biological sciences and the topics will differ each term. Course requirements may include lecture, laboratory, readings, discussion, reporting, and internships or fieldwork, which may be conducted on- or off-campus as well as online. May be taken more than once for credit.

BY 597. Investigative Techniques. 2 Hours.
This course focuses on the application of modern experimental techniques in solving research problems. Specifically, we will discuss important methodological advances in various subdisciplines of biology by examining seminal papers from the scientific literature. The articles might include a mix of historical and current articles. The class will use a journal club format for weekly discussions in person or virtually, with additional content provided CMS.

BY 598. MR Lev Non-Thesis Research. 1-10 Hour.

BY 605. Microbial Physiology. 3 Hours.
Microbial structure and function, growth, metabolism, and regulation of cellular activity. Independent project required. Prerequisites: Permission of instructor. 3 credit hours.

BY 607. Microbial Ecology. 3 Hours.
This course examines microorganisms in their natural habitats, with a focus on soil and aquatic ecosystems as well as symbiotic interactions between microbes and animals and plants. Students will learn both theory and practical techniques for studying microbial ecology, including hands-on exposure to modern bioinformatic analysis methods for microbial communities. Independent project required. 3 credit hours.

BY 610. Comparative Animal Physiology. 3 Hours.
Special physical and chemical processes occurring at cell tissue, and organ levels. Independent projects required.

BY 611. Advanced Human Anatomy. 4 Hours.
This course is a detailed, advanced examination of human anatomy and histology. In a laboratory setting, students will achieve course objectives from dissecting a human cadaver, and observing prosected cadavers and casted models.

BY 612. CIRTL-Biology. 1-4 Hour.
This discipline specific seminar course in CIRTL (The Center for the Integration of Research, Teaching and Learning) - Biology is specially designed to offer students a hands-on opportunity to do an in-depth analysis on various effective teaching techniques that can be utilized in a typical college classroom setting. In the light of this analysis, students are expected to deliver a presentation simulating a classroom lecture on any topic related to Biology or if they prefer, they can also give an oral presentation on any pedagogical topic.

BY 613. CIRTL Service-Learning Workshop. 1 Hour.
This workshop offered by the Department of Biology for CIRTL (The Center for the Integration of Research, Teaching and Learning) @UAB is specially designed to offer students a hands-on opportunity on designing a service-learning course in the realm of their study with an added emphasis on the importance of service-learning in today's classroom.

BY 614. Advanced Cell Biology. 3 Hours.
This course will focus on understanding cell signaling, function, and dynamics, which is the core of modern cell biology topics. This course is targeted to students who are interested in the advanced level current topics of Cell Biology. Topics include the cellular organization and function, cell cycle, autophagy, apoptosis, stem cell and cellular signaling pathways. This course also includes reading of primary literature, and writing and presenting a research proposal. Graduate project required.

BY 616. Cellular Physiology. 3 Hours.
Structure and function of cells and their components at the molecular level. Laboratory experience using modern equipment and biochemical methods. Independent project required.

BY 617. Science Policy. 3 Hours.
Science and technology intersect with multiple areas of public policy. Think of the growing concerns over technological surveillance, the debates over policy for climate change mitigation, the challenges posed due to global health crises, or the fear that American research and development competitiveness is eroding in a globalized economy. These issues reflect important questions about the relationship between science, technology, and public policy. Are scientific and technological developments governable, and if so, how and by whom? Is more and better science always better for policymaking? Who is the best judge of the value of scientific research programs and the validity of scientific findings? Are scientific and technological innovations generally socially beneficial, and who decides? What role should policymakers play in regulating science?.

BY 618. Colloquium in Biology of Aging. 1 Hour.
The course will focus on readings and interpretation of scientific papers, data, and experimental results relevant to endocrinology and aging. In addition to readings, oral presentations, discussions, and a research proposal are the major components of the course.

BY 619. Reproductive Physiology. 3 Hours.
Comparative reproductive physiology in animals with emphasis on mammals. Independent project required.

BY 620. General Endocrinology. 3 Hours.
The central theme of this course is the role of hormone chemical messengers in the regulation of physiological processes. Topics include structure of endocrine cells and glands, hormone synthesis and chemistry, physiological effects of hormones, and mechanisms of hormone action. Emphasis is placed on vertebrate systems, but instructive invertebrate systems are also considered. Term paper required.
Prerequisites: BY 256 [Min Grade: C]

BY 626. Evolutionary Medicine. 3 Hours.
An evolutionary approach to issues relating to human health and disease.

BY 628. Instruct Bio Labs: Teaching Techniques. 3 Hours.
Student will assist in instruction of an introductory biology laboratory. Responsibilities will also include preparation of quizzes and practicals and designing and conducting an instructional laboratory exercise.

BY 629. Evolutionary Biology. 3 Hours.
This course introduces the history of evolutionary thought and modern evolutionary theory. Discussions cover (but are not limited to) the history of life, mechanisms of evolutionary change, sexual selection, adaptation, speciation, and molecular evolution. Students will also be introduced to historical and contemporary studies of evolution on a wide variety of topics and organisms. Regular meetings outside of lecture will involve discussions of classic and contemporary research papers in the field.

BY 632. Biological Information Resources. 3 Hours.
The National Center for Biological Information (NCBI) website is a treasure house of information and tools for researchers in all areas of modern Biology. The goal of this course is to provide guidance for students who wish to become familiar with the NCBI website through an online learning experience. They will learn many of the features available at this site and will gain experience using some of the tools. The course will be taught completely online and will consist of 1) Guidelines for navigating through NCBI, 2) Study guide questions for students to answer online, 3) NCBI tutorials with questions to be answered online, 4) Assignments with questions to be answered online, 5) Online exams. Graduate levels require a graduate project.
Prerequisites: BY 123 [Min Grade: C] or BY 124 [Min Grade: C]

BY 633. Advanced Molecular Genetics and Medicine. 3 Hours.
Examination of the molecular genetics of eukaryotic organisms, including genomes, nucleosomes, chromosomes, transcription, splicing, transposition and signal transduction. The role of molecular biology in immune diversity and cell growth will also be studied.

BY 634. Functional Genomics and Systems Biology. 3 Hours.
Systems biology is an inter-disciplinary study underlying complex biological processes as integrated systems of many interacting components. This course will give students a foundation in understanding complex biological interactions at the molecular, network and genomic level. This course will cover state-of-the-art high throughput established and novel approaches used in genome sequencing, transcriptomics, proteomics and metabolomics to obtain, integrate and analyze complex data. The students will also get familiar with knowledge on experimental perturbation of genomes, gene regulatory networks, comparative genomics and evolution, basic bioinformatics. This course will be a combination of text based lectures and discussions of the current literature relevant to Functional Genomics and Systems Biology. Prerequisite: BY210 minimum grade of C.
Prerequisites: BY 210 [Min Grade: C]

BY 636. Biological Processes in Aging. 3 Hours.
The #1 threat to human health – far greater than cancer, heart disease, and Alzheimer's disease combined – is aging. Aging is also a fascinating biological puzzle. Why do we, and virtually every other species, age in the first place? Why can't nature simply maintain the body it built? This course will introduce you to the fascinating process of biological aging, its impact on human and animal life, how it evolved, and the manner in which its biology is investigated, the cellular and molecular process that underlie aging, and how efforts to slow human aging are progressing. We will cover the history of exceptionally long human and animal lives and also delve into current and historical approaches to alter the rate of aging in humans with an emphasis on current promising research areas. In covering this material we will also encounter some of the many colorful scientists who have worked on the problem of aging as well as the past and current frauds and charlatans who are just trying to make a buck off of people's fear of death and disability.
Prerequisites: BY 123 [Min Grade: C] and BY 210 [Min Grade: C]

BY 637. Epigenetics. 3 Hours.
This course provides a survey of the field of epigenetics, introducing the student to the diverse areas of epigenetic research in a variety of eukaryotic systems. The course combines lectures with discussion of primary literature and research talks from invited faculty speakers working in epigenetics. In addition to providing an overview of the field of epigenetics, this course emphasizes working with primary scientific literature and the development of critical reading skills. Additional assignments are required for graduate credit.

BY 640. Immunology. 3 Hours.
Immune system and functions of host humoral and cellular immune responses. Mechanisms of antigen and antibody reactions and basic immunological methods. Term paper required.

BY 642. Experimental Phycology. 4 Hours.
Introduction to algae. Experimental approaches to productivity. Algae as model systems. Independent project required. Concurrent enrollment in BY 642 lab required.

BY 642L. Experimental Phycology Lab. 0 Hours.
Lab must be taken concurrently with BY 642 lecture.

BY 644. Biological Experimental Design and Methods. 3 Hours.
This course focuses on advanced modern experimental design and its use in biological research. Specifically, we will discuss principles of open science and their implications for data management as they apply to commonly used methods in biological research. We will discuss experimental design, the use of appropriate controls, and the interpretations of the results obtained. Methods covered in detail will include for example PCR, DNA sequencing (Sanger and NGS), fluorescent microscopy, and bioinformatics. The class will use a combination of lecture, in-class activities, and discussion sessions, with additional content provided on Canvas.

BY 645. Neuroanatomy. 4 Hours.
This course will provide detailed lecture and laboratory experiences that describe the anatomy of the human brain, spinal cord, and peripheral nervous system. Students will culture rat hippocampal neurons and map the cerebral and cerebellar cortex on preserved human brains. Deep brain structures will be identified and their functional significance explored. Cranial nerves and major peripheral nerves will be described and identified through cadaveric dissections. Normal pathways will be contrasted with examples of abnormalities along with the resulting functional impairments. Graduate credit will be earned through the completion of additional term papers and/or projects.

BY 646. Techniques in Biological Research. 3 Hours.
Concepts and practical application of techniques pertinent to biological research.

BY 647. Contemporary Political Issues in Science. 3 Hours.
Our rapidly changing world faces significant, multi-faceted problems at the nexus of technology and society. The response to these socio-scientific issues will impact the future of the human condition. The scientific process has a role to play in finding timely, effective, and evidence-based solutions. This course showcases science as a dynamic and iterative process that includes collecting and connecting observations, making hypotheses based on the current understanding, and constructing models that are revised as new knowledge is acquired. It emphasizes the role of dialogue and communication in shaping responses to socio-scientific issues.

BY 648. Psychoneuroimmunology. 3 Hours.
Explores communication between neuroendocrine and immune systems.

BY 651. Advanced Plant Biology. 3 Hours.
This course introduces the student to the advanced concepts of plant biology including plant diversity, structure, physiology, metabolism, reproduction, genetics, molecular biology, evolution and ecology. It is targeted to Biology Graduate Students. This class brings together knowledge and methodologies from a number of different disciplines to provide students with an intensive and comprehensive plant curriculum from the molecular to the organismal level.

BY 652. Field Botany for Teachers. 4 Hours.
Principles and techniques of plant identification and classification; consideration of phylogenetic systems. Lectures and field trips. Independent project required.

BY 652L. Field Botany Lab. 0 Hours.
Lab must be taken with BY 652 lecture.

BY 655. Statistics and Modeling for Biologists. 3 Hours.
An introduction to a broad array of statistical and modeling techniques used to analyze and interpret biological data of different kinds. Emphasis will be on the design, application, and interpretation of statistical techniques. R programming will be used through the course. Prior knowledge of statistics and R programming is not required. Lecture, computer-based laboratory, and problem sets.

BY 656. Comparative Vertebrate Anatomy. 4 Hours.
Study of the anatomical systems of vertebrates in an evolutionary and functional context. Covers form, function, development and phylogeny of vertebrates, with overviews of organ systems, and the major adaptive events of vertebrate evolution. Labs complement lectures with dissections of representative species, and surveys of specializations in other forms. Lecture and laboratory.

BY 656L. Comparative Vertebrate Anatomy Lab. 0 Hours.
Comparative Vertebrate Anatomy Lab required with BY 656 lecture.

BY 662. Introductory Neurobiology. 3 Hours.
Introduction to biological basis of nervous system function. Comparative approach applying molecular, cellular, and systems' concepts to nervous system function is used to examine electrical and chemical signaling, neural circuitry, and cellular basis of behavior and neural development. Independent project required.

BY 667. Population Ecology. 3 Hours.
This course covers the structure and dynamics of populations with an emphasis on understanding how reproduction, mortality, and dispersal interact to control fluctuations in population size and structure. Special emphasis will be placed on the use of models to address specific applications in conservation biology and natural resource management. Independent project/paper required. Preqs: BY 570 & graduate stranding or permission of instructor.

BY 668. Ecological Genetics. 3 Hours.
This intensive course will introduce students to the genetic tools of modern population biology – which ones are available, practical, and useful for particular questions – and how these genetic analyses have been applied to a wide variety of ecological topics, including: dispersal, life histories, recruitment, habitat and mate choice, local selection, genetic differentiation, the conservation of biodiversity, and speciation. Importantly, this course is an opportunity to become proficient at applying molecular tools to bolster ecological studies. Time will be spent in lectures and learning practical coding and data analyses. Graduate-level assignments required.

BY 670. Scientific Communication. 3 Hours.
Becoming a professional biologist is challenging and requires mastering a variety of skills. This course complements the biological knowledge graduate students gain from other courses and their thesis research by providing training, experience, and critical feedback in the following areas.

BY 671. Biochemical Adapt Environment. 3 Hours.
Examination of physiological and biochemical adaptations of organisms to physical environment.

BY 673. Biochemical Adaptation to the Environment. 3 Hours.

BY 674. Chemical Ecology. 3 Hours.
Study of chemical interactions between organisms or between organisms and their environment. Topics include chemical signaling between organisms, sensing of the chemical environment, and chemical defenses against predators, pathogens, biofoulers, or competitors. Students will be introduced to these topics in a wide variety of terrestrial and aquatic habitats. Independent project/paper required. Preq: Graduate standing.

BY 675. Comparative Developmental Biology. 3 Hours.
Mechanisms of development with emphasis on comparative biology. Graduate standing.
Prerequisites: BY 210 [Min Grade: D]

BY 677. Design Thinking to Solve Problems through Science Policy. 3 Hours.
This program capstone course includes the application of the basic tools of inquiry into social problems; basic ethical issues in contemporary science; analyzing the problem; analyzing any relevant policies; data validity and reliability; data-gathering techniques; data management; solution(s) generation; disciplinary standards for writing the proposal and reporting findings. Over the course of the semester, students will be exposed to different sectors that overlap science and society (public, private, non-profit).

BY 678. Biology Graduate Seminar. 0 Hours.
Graduate Students in Biology MS Plan I or PhD programs will participate in a series of departmental seminars exposing them to versatile sub-disciplines of Biology as well as various career paths. Departmental seminars are part of an enriching experience that lays the foundation for our students' future professional careers. Attendance will be required.

BY 679. Colloquium in Evidenced Based Teaching. 1 Hour.
This pedagogy based colloquium is designed to prepare the next generation of future STEM faculty members in evidence-based practices. The course will begin with an in-depth discussion related to the Vision and Change in Biology Undergraduate Education: A Call to Action. Specific chapters from this document will be assigned as “Reading Assignments” on a weekly basis. Furthermore, journal article discussions will be included to better understand innovative teaching strategies like active-learning, classroom-response system, inclusive learning environments and initiating team based learning activities.

BY 680. Epigenetics Discussion. 1 Hour.
This course provides the student with an exposure to a wide range of basic epigenetics research topics. It will promote scientific literacy, discussion skills, and critical thinking skills. In addition, students will gain experience developing lectures and providing constructive criticisms to their peers.

BY 681. Colloquium in Physiological Ecology. 1 Hour.
Current research.

BY 682. Colloquium in Immunology. 1 Hour.
Current research.

BY 683. Colloquium in Physiology. 1 Hour.
Current research.

BY 684. Colloquium in Microbial Ecology. 1 Hour.
Current research.

BY 685. Colloquium in Cell Biology. 1 Hour.
Current research.

BY 686. Colloquium in Mammalian Development. 1 Hour.
Current research.

BY 687. Colloquium in Endocrinology. 1 Hour.
Current research.

BY 688. Colloquium in Algal Ecophysiology. 1 Hour.
Current research in specific areas.

BY 689. Colloquium in Genetics. 1 Hour.
Current research.

BY 690. Colloquium in Cellular Physiology. 1 Hour.
Current research in specific areas.

BY 691. Colloquium in Botany. 1 Hour.
Current research developments.

BY 692. Colloquium in Ecology. 1 Hour.
Current research.

BY 693. Colloquium in Embryology. 1 Hour.
Current research.

BY 694. Colloquium in Microbiology. 1 Hour.
Current research in microbial ecology and microbial physiology.

BY 695. Special Topics in Biology I. 1-4 Hour.
This course will consider graduate-level topics from the various disciplines in the biological sciences and the topics will differ each term. Course requirements may include lecture, laboratory, readings, discussion, reporting, and internships or fieldwork, which may be conducted on- or off-campus as well as online. May be taken more than once for credit.

BY 696. Special Topics in Biology II. 1-4 Hour.
This course will consider advanced MS-level topics from the various disciplines in the biological sciences and the topics will differ each term. Course requirements may include lecture, laboratory, readings, discussion, reporting, and internships or fieldwork, which may be conducted on- or off-campus as well as online. May be taken more than once and may be repeated for no more than a total of 8 credits.

BY 697. Investigative Techniques. 1-2 Hour.
Application of modern experimental techniques in solving research problems.

BY 698. Nonthesis Research. 1-12 Hour.
Non-thesis research hours.

BY 699. Thesis Research. 1-10 Hour.
Prerequisite: Admission to candidacy.
Prerequisites: GAC M

BY 718. Colloquium in Biology of Aging. 1 Hour.
The course will focus on readings and interpretation of scientific papers, data, and experimental results relevant to endocrinology and aging. In addition to readings, oral presentations, discussions, and a research proposal are the major components of the course.

BY 732. Biological Information Resources. 3 Hours.
The National Center for Biological Information (NCBI) website is a treasure house of information and tools for researchers in all areas of modern Biology. The goal of this course is to provide guidance for students who wish to become familiar with the NCBI website through an online learning experience. They will learn many of the features available at this site and will gain experience using some of the tools. The course will be taught completely online and will consist of 1) Guidelines for navigating through NCBI, 2) Study guide questions for students to answer online, 3) NCBI tutorials with questions to be answered online, 4) Assignments with questions to be answered online, 5) Online exams. Graduate levels require a graduate project.
Prerequisites: BY 123 [Min Grade: C] or BY 124 [Min Grade: C]

BY 734. Functional Genomics and Systems Biology. 3 Hours.
Systems biology is an inter-disciplinary study underlying complex biological processes as integrated systems of many interacting components. This course will give students a foundation in understanding complex biological interactions at the molecular, network and genomic level. This course will cover state-of-the-art high throughput established and novel approaches used in genome sequencing, transcriptomics, proteomics and metabolomics to obtain, integrate and analyze complex data. The students will also get familiar with knowledge on experimental perturbation of genomes, gene regulatory networks, comparative genomics and evolution, basic bioinformatics. This course will be a combination of text based lectures and discussions of the current literature relevant to Functional Genomics and Systems Biology. Prerequisite: BY210 minimum grade of C.
Prerequisites: BY 210 [Min Grade: C]

BY 736. Biological Processes in Aging. 3 Hours.
The #1 threat to human health – far greater than cancer, heart disease, and Alzheimer's disease combined – is aging. Aging is also a fascinating biological puzzle. Why do we, and virtually every other species, age in the first place? Why can't nature simply maintain the body it built? This course will introduce you to the fascinating process of biological aging, its impact on human and animal life, how it evolved, and the manner in which its biology is investigated, the cellular and molecular process that underlie aging, and how efforts to slow human aging are progressing. We will cover the history of exceptionally long human and animal lives and also delve into current and historical approaches to alter the rate of aging in humans with an emphasis on current promising research areas. In covering this material we will also encounter some of the many colorful scientists who have worked on the problem of aging as well as the past and current frauds and charlatans who are just trying to make a buck off of people's fear of death and disability.
Prerequisites: BY 123 [Min Grade: C] and BY 210 [Min Grade: C]

BY 737. Epigenetics. 3 Hours.
This course provides a survey of the field of epigenetics, introducing the student to the diverse areas of epigenetic research in a variety of eukaryotic systems. The course combines lectures with discussion of primary literature and research talks from invited faculty speakers working in epigenetics. In addition to providing an overview of the field of epigenetics, this course emphasizes working with primary scientific literature and the development of critical reading skills. Additional assignments are required for graduate credit.

BY 746. Tech in Biological Research I. 3 Hours.
Concepts and practical application of techniques pertinent to biological research.

BY 755. Statistics and Modeling for Biologists. 3 Hours.
An introduction to a broad array of statistical and modeling techniques used to analyze and interpret biological data of different kinds. Emphasis will be on the design, application, and interpretation of statistical techniques. R programming will be used through the course. Prior knowledge of statistics and R programming is not required. Lecture, computer-based laboratory, and problem sets.

BY 767. Population Ecology. 3 Hours.
This course covers the structure and dynamics of populations with an emphasis on understanding how reproduction, mortality, and dispersal interact to control fluctuations in population size and structure. Special emphasis will be placed on the use of models to address specific applications in conservation biology and natural resource management. Independent project/paper required. Graduate standing or permission of instructor.

BY 768. Conservation Genetics. 3 Hours.
This intensive course will introduce students to the genetic tools of modern population biology – which ones are available, practical, and useful for particular questions – and how these genetic analyses have been applied to a wide variety of ecological topics, including: dispersal, life histories, recruitment, habitat and mate choice, local selection, genetic differentiation, the conservation of biodiversity, and speciation. Importantly, this course is an opportunity to become proficient at applying molecular tools to bolster ecological studies. Time will be spent in lectures and learning practical coding and data analyses.

BY 770. Scientific Communication. 3 Hours.
Becoming a professional biologist is challenging and requires mastering a variety of skills. This course complements the biological knowledge graduate students gain from other courses and their thesis research by providing training, experience, and critical feedback in the following areas.

BY 780. Epigenetics Discussion. 1 Hour.
This course provides the student with an exposure to a wide range of basic epigenetics research topics. It will promote scientific literacy, discussion skills, and critical thinking skills. In addition, students will gain experience developing lectures and providing constructive criticisms to their peers.

BY 781. Colloquium in Physiological Ecology. 1 Hour.
Current research.

BY 782. Colloquium in Immunology. 1 Hour.
Current research.

BY 783. Colloquium in Physiology. 1 Hour.
Current research.

BY 784. Colloquium in Microbial Ecology. 1 Hour.
Current research.

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Current research.

BY 786. Colloquium in Mammalian Development. 1 Hour.
Current research.

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Current research.

BY 788. Colloquium in Algal Ecophysiology. 1 Hour.
Current research in specific areas.

BY 789. Colloquium in Genetics. 1 Hour.
Current research in Genetics.

BY 790. Colloquium in Cellular Physiology. 1 Hour.
Current research in specific areas.

BY 791. Colloquium in Botany. 1 Hour.
Current research developments.

BY 792. Colloquium in Ecology. 1 Hour.
Current research.

BY 793. Colloquium in Embryology. 1 Hour.
Current research.

BY 794. Colloquium in Microbiology. 1 Hour.
Current research in microbial ecology and microbial physiology.

BY 795. Special Topics in Biology I. 1-4 Hour.
This course will consider graduate-level topics from the various disciplines in the biological sciences and the topics will differ each term. Course requirements may include lecture, laboratory, readings, discussion, reporting, and internships or fieldwork, which may be conducted on- or off-campus as well as online. May be taken more than once for credit.

BY 796. Special Topics in Biology II. 1-4 Hour.
This course will consider advanced graduate-level topics from the various disciplines in the biological sciences and the topics will differ each term. Course requirements may include lecture, laboratory, readings, discussion, reporting, and internships or fieldwork, which may be conducted on- or off-campus as well as online. May be taken more than once and may be repeated for no more than a total of 8 credits.

BY 797. Investigative Techniques. 1-2 Hour.
Application of modern experimental techniques in solving research problems.

BY 798. Nondissertation Research. 1-10 Hour.
Non-dissertation research hours.

BY 799. Dissertation Research. 1-10 Hour.
Dissertation research hours. Admission to candidacy required.
Prerequisites: GAC Z

MESC-Marine Environmental Sci Courses

MESC 541. Benthic Community Structure. 4 Hours.
Benthic Comunity Structure.

MESC 550. Marine Plant and Animal Interactions. 2 Hours.
Marine Plant and Animal Interactions.

MESC 595. Phytoplankton Ecology and Physiology. 2 Hours.
Phytoplankton Ecology and Physiology.

MESC 796. Special Topics in Marine Science. 1-6 Hour.

Chemistry

To obtain specific admissions requirements on how to apply to Graduate School, prospective students should visit this page:https://www.uab.edu/cas/chemistry/graduate-program

Degree Offered:	Ph.D., M.S.
Director:	Aaron L. Lucius, Ph.D.
Phone:	(205) 934-8096
Fax:	(205) 934-2543
E-mail:	allucius@uab.edu
Website:	www.uab.edu/cas/chemistry

Program Information

The UAB Department of Chemistry offers graduate programs leading to the Doctor of Philosophy (Ph.D.) and Master of Science (M.S.) degrees that are designed to ensure disciplinary quality and research competency. The Department of Chemistry has an outstanding research active faculty and highly collaborative culture that is conducive to stimulating graduate studies in a collegial atmosphere. The graduate program in the Department of Chemistry provides opportunities for research mentors to provide personalized attention to the academic and research progress of each of our graduate students.

Key features of the Department of Chemistry Graduate Program:

- Students are quickly integrated into research laboratories (ideally in first semester)
- Research is highly collaborative, both within the Department of Chemistry and the UAB biomedical research complex
- Interdisciplinary programs to broaden research interests including drug discovery, advanced materials, biophysical chemistry, structural biology, and nanomaterials
- Strong record of career success for graduates in academia, industry, and government

All graduate students are required to pursue a graduate curriculum that provides the general knowledge-based foundation through a series of six core curriculum courses (18 semester hours). The graduate student and the graduate research mentor (in consultation with the student's graduate research committee) select additional graded graduate courses to complete a minimum of 24 semester hours. There is no semester hour requirement for additional course work but the student must complete a minimum of 24 semester hours of graduate coursework with an overall GPA of 3.0 or higher. Chemistry graduate students may also participate in and enroll in interdisciplinary graduate programs, requiring enrollment in courses in other departments throughout the UAB campus that will broaden the students background in selective areas and greatly strengthen their ability to carry out interdisciplinary research.

All graduate students are to demonstrate communication skill competency. Adequate performance is required on the departmental literature seminar, written responses to essay questions, dissertation defense, teaching, written publications, and professional presentations at scientific meetings. All chemistry graduate students are required to complete GRD 715 (Graduate Teaching Assistantship Training) during their first term in the program. Students with English as a second language enroll for 3 semester hours. All others enroll in this course for 2 semester hours. This course is required but is not counted toward the 24 semester hour minimum.

During the Fall semester, first year graduate students are required to enroll in CH 790 (Introduction to Graduate Research). The student will be introduced to the graduate research faculty and their research interests. The student is required to meet with prospective research mentors to discuss interest in the prospective mentor's laboratory and if needed, schedule a 3-4 week rotations in research laboratories of interest. The process of selecting the graduate research mentor must be completed by the end of the student's first year.

Core Courses:

Requirements		Hours
CH 629/729	Special Topics in Physical Chemistry	3
CH 630/730	Physical Organic Chemistry	3
CH 631/731	Organic Reactions and Their Mechanisms	3
CH 632/732	Organic Reactions and Synthesis	3
CH 633/733	Reactive Intermediates and Conservation of Bonding	3
CH 639/739	Special Topics in Organic Chemistry	1-3
CH 642/742	Organometallic Chemistry and Catalysis	3
CH 649/749	Special Topics in Inorganic Chemistry	1-3
CH 651/751	Chemometrics	3
CH 652/752	Analytical Spectroscopy	3
CH 654/754	Multivariate Analysis in Analytical Chemistry	3
CH 659/759	Special Topics in Analytical Chemistry	3
CH 660/760	Fundamentals of Biochemistry	3

CH 661/761	Biochemistry II	3
CH 663/763	Biochemistry Laboratory	3
CH 664/764	Biophysical Chemistry	3
CH 669/769	Special Topics in Biochemistry	3
CH 671/771	Medicinal Chemistry and Drug Discovery	3
CH 672/772	Chemistry of Natural Products	3
CH 680/780	Polymer Chemistry I	3
CHL 680L/780L	Polymer Chemistry I Laboratory	1
CH 681/781	Polymer Chemistry II	3
CHL 681L/781L	Polymer Chemistry II Laboratory	1
CH 689/789	Special Topics in Polymer Chemistry	3

Substitutions are permitted with the approval of the student's research advisory committee and director of the graduate program. Master's students choose from the 600 courses, Ph.D. students from the 700 courses.

M.S. Program

Plan I

Plan I is a research program that requires a minimum of 24 semester hours (including 18 semester hours of core courses) of formal academic coursework approved by the student's graduate study committee. The progress of the student's research program is monitored by the graduate study committee. The student, having been admitted to candidacy and having completed an approved plan of research, will complete and defend a thesis.

Plan II

Plan II is a non-thesis program that requires a minimum of 30 semester hours (including 18 semester hours of core courses) of appropriate graduate work that has been approved by the student's graduate study committee and Department of Chemistry Graduate Program Director.

Entry Term	Deadline
Deadline for Entry Term(s)	Each semester
Deadline for All Application Materials to be in the Graduate School Office	Six weeks before term begins
Number of Evaluation Forms Required	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments	None

5 th Year Master's Degree in Biochemistry

This is a research intensive degree program and to be eligible for admission in the senior year, students must start their undergraduate research experience as early as possible, preferably in their sophomore year.

Admission Requirements:

- Achieved status of Senior chemistry major
- GPA of 3.0 or higher
- Enrolled in CHEM 297 (Introduction to Undergraduate Research) by the Fall semester of the Junior year
- Selection of faculty research mentor (in the Department of Chemistry or Department of Biochemistry & Molecular Genetics) by Spring semester of the Junior year and enroll in CHEM 497 (Undergraduate Research) by Spring semester of the Junior year

Admission to the 5th-year MS program will additionally require:

- Satisfactory performance on Graduate Record Exam (GRE) taken in the Senior year (first term)
- Strong letter of nomination for admission to the program from their undergraduate research mentor

The 5th-year M.S. Chemistry/Biochemistry Oversight Committee, composed of two faculty members from the Department of Chemistry (including the Department of Chemistry Graduate Program Director) and two faculty members from the Department of Biochemistry (GBS-BSSB theme including the GBS-BSSB Graduate Program Director) will review applicants and approve admission to the program.

For detailed information, contact Ms. Laura J. Knighten, Graduate Recruitment Coordinator, 1720 2nd Avenue South, Birmingham, AL 35294-1240.

Telephone 205-934-8139 | E-mail knighten@uab.edu | Web www.uab.edu/cas/chemistry

Ph.D. Program

For Ph.D. students, there are no specific course requirements beyond the core courses. The academic program is determined through the action of the student's graduate research mentor and graduate research committee. The student is required to successfully complete their departmental seminar by the end of their second year. A written qualifying examination must be passed in the student's area of specialization. If failure occurs, only one repeat exam is allowed. An original research proposal must be successfully defended within 12 months of completion of the written qualifying examination. If failure occurs, one repeat defense is allowed. Once admitted to candidacy for the Ph.D. degree, the student must write and successfully defend a research dissertation.

Courses

CH 525. Physical Chemistry I for Graduate Study. 3 Hours.
Thermodynamics and chemical equilibria; and chemical kinetics. Prerequisites: Calculus II, College Physics II and General Chemistry II.

CH 526. Physical Chemistry II for Graduate Study. 3 Hours.
Quantum mechanics, chemical bonding, and molecular spectroscopy. Prerequisites: Calculus II, College Physics II and General Chemistry II.

CH 535. Organic Chemistry I for Graduate Study. 3 Hours.
Structure, nomenclature, properties, and reactivity of compounds with various organic functional groups: alkanes, alkenes, alkynes, alkyl halides and alcohols. Emphasis on the mechanisms of organic reactions and problem solving. Prerequisite: General Chemistry II.

CH 537. Organic Chemistry II for Graduate Study. 3 Hours.
Reactions of aromatic compounds and carbonyl containing functional groups: aldehydes, ketones, acids, esters and amides. Molecules of biological interest, such as proteins and carbohydrates. Prerequisite: Organic Chemistry I.

CH 540. Inorganic Chemistry I for Graduate Study. 3 Hours.
Chemical reactivity and descriptive chemistry in terms of structural and electronic parameters. Prerequisites: Organic Chemistry II and Organic Chemistry II laboratory with a grade of C or better.

CH 541. Transition Metal Chemistry. 3 Hours.
Atomic structure, chemical bonding characterization and reactivity of transition metal complexes. Prerequisites: Inorganic Chemistry and Physical Chemistry II.

CH 550. Instrumental Analysis for Graduate Study. 3 Hours.
Focus on modern analytical chemistry instrumentation including chemical separations, spectroscopies (atomic absorption, infrared, UV-visible, fluorescence), nuclear magnetic resonance spectroscopy, mass spectroscopy, and thermal analysis. Concurrent enrollment in CH 550L Instumental Analysis Laboratory is recommended. Prerequisites: Quantitative Analysis Techniques.

CH 550L. Instrumental Analysis Laboratory for Graduate Study. 0 Hours.
Instrumental Analysis Laboratory . Concurrent enrollment in CH 550 Instrumental Analysis for Graduate Study required.

CH 555. Quantitative Analysis for Graduate Study. 4 Hours.
Principles of analytical measurements, gravimetric analysis, spectrophotometric analysis, and chromatography, with emphasis on equilibrium and applications. Lecture and laboratory. Concurrent enrollment in CH 555L Quantitative Quanitative Analysis Lab required. Prerequisite: General Chemistry II.
Prerequisites: CH 550 [Min Grade: C]

CH 555L. Quantitative Analysis I for Graduate Study Lab. 0 Hours.
Emphasizing quantitative analysis laboratory. Concurrent enrollment in CH 555 Quantitative Analysis required.

CH 560. Fundamentals of Biochemistry. 3 Hours.
Overview of biochemical principles; chemistry of aqueous solutions, biochemical building blocks including amino acids, carbohydrates, lipids, and nucleotides; structure and function of proteins, membranes and nucleic acids; enzyme kinetics. Catabolic and anabolic metabolism in biomolecules, regulation of metabolic processes.
Prerequisites: CH 237 [Min Grade: C] or CH 247 [Min Grade: C]

CH 561. Advanced Biochemistry I. 3 Hours.
Advanced study of protein structure and function, enzymology, DNA structure, prokaryotic replication, transcription, and protein synthesis. Membrane structure and function, carbohydrate structure and function. Methods for isolating and characterizing macromolecule structure and function including chromatography, gel electrophoresis, CD, UV, and fluorescence spectroscopy, mass spectroscopy, X-ray crystallography and nuclear magnetic resonance spectroscopy.
Prerequisites: CH 560 [Min Grade: C]

CH 562. Advanced Biochemistry II. 3 Hours.
Continuation of Advanced Biochemistry I focusing on eukaryotic replication, transcription, translation, regulation of gene expression, genomics, proteomics, biological signaling. Prerequisites: Successful completion of CHEM 561.
Prerequisites: CH 561 [Min Grade: C]

CH 563. Biochemistry Laboratory. 3 Hours.
Introduction to modern bioanalytical techniques used for the expression, isolation and characterization of proteins and other biological macromolecules. Prerequisites: Quantitative Analysis and Biochemistry and permission of instructor.

CH 564. Physical Biochemistry Laboratory. 3 Hours.
Physical/analytical approaches (including mass spectroscopy and NMR) toward determination of macromolecular structures, ligand binding, and enzymology. Prerequisites: Background in physical chemistry I and II, quantitative analysis, and biochemistry. Permission of instructor required.
Prerequisites: CH 325 [Min Grade: C] and CH 355 [Min Grade: C] and CH 461 [Min Grade: C]

CH 565. Structural Biochemistry. 3 Hours.
Principles of macromolecular structure, emphasizing proteins, nucleic acids, and macromolecular assemblies. Computational methods used to teach principles and modeling software used for construction of computer models of proteins and nucleic acids. Lecture and computer Laboratory.

CH 571. Medicinal Chemistry & Drug Discovery. 3 Hours.
An advanced organic course with emphasis on design strategies for discovering small organic molecule drugs using common macromolecular drug targets. Examples of successful design for clinically used drug classes will be presented.

CH 573. Electron Pushing and Total Synthesis. 3 Hours.
The advanced organic course is aimed to enhance students' comprehension of advanced organic chemistry theory and principles, and apply them to understand reaction mechanisms and tactic of total synthesis. It will cover different types of common organic reactions each week, for example, reactions involving anion intermediates, cation intermediates, rearrangement, photochemical process, carbonyl compounds, and other reactive intermediates. Using electron pushing for mechanistic reasoning will be emphasized.

CH 574. X-Ray Crystallography. 3 Hours.
Fundamental principles of X-ray crystallography. Students gain enough information to be able to collect meaningful data and analyze and refine structures. Students learn how to collect, process and and analyze x-ray data, focus on heavy atom phasing techniques and use state of the art software for refinement. Permission of instructor.

CH 580. Polymer Chemistry I. 3 Hours.
Basic chemical principles of polymers with the focus on synthesis, characterization, and applications of synthetic and biological macromolecules. Includes laboratory. Prerequisites: undergraduate organic chemistry and permission of instructor. Concurrent enrollment in CH 580 is recommended.

CH 580L. Polymer Chemistry I for Graduate Study Laboratory. 1 Hour.
Polymer Chemistry I Laboratory.

CH 581. Polymer Chemistry II. 3 Hours.
Fundamentals of chemical, physical, and molecular aspects of polymers in bulk and solutions. Prerequisites: undergraduate organic chemistry and permission of instructor. Concurrent enrollment in CH 581L is recommended.
Prerequisites: CH 580 [Min Grade: C]

CH 581L. Polymer Chemistry II Laboratory. 1 Hour.
Laboratory to accompany CH 581 (Polymer Polymer Chemistry II). Concurrent enrollment in CH 581 is recommended.

CH 583. Chemistry of Polymers and Polymeric Materials I. 3 Hours.
Basic chemical principles of polymers with the focus on synthesis, characterization, and applications of synthetic and biological macromolecules. No laboratory is required. This course sequence is for BME or Material Science Graduate Students. The laboratory accompanying Polymer Chemistry I is NOT required for these students.

CH 584. Chemistry of Polymers and Polymeric Materials II. 3 Hours.
Fundamentals of chemical, physical and molecular aspects of polymers in bulk and solutions. No laboratory is required. The laboratory accompanying Polymer Chemistry II is NOT required.

CH 602. Principles of Chemical Instruction. 3 Hours.
Responsibilities of laboratory instructors, safety regulations, grading, teaching styles and formats, and instructional objectives.

CH 609. Chemical Safety. 3 Hours.
Principles involved in the potential hazards of storing, using, and disposal of chemicals for chemical educators.

CH 610. Laboratory Experiences in Chemistry. 3 Hours.
Application of chemical experiments to high school science programs. Experiments and emphasis may change depending on instructor. Course may be repeated for credit.

CH 611. Atomic Structure and Periodicity for the 7-12 Classroom. 3 Hours.
Exploration of the historical development of atomic structure. Developing instructional strategies to analyze and predict patterns from atomic structure.

CH 612. Valence Electrons and Bonding Models for the 7-12 Classroom. 3 Hours.
Describes how to use the periodic table as a systematic representation to predict and explain physical properties. Explores ionic and covalent bonding models. Predicts molecular shapes and investigates how these predictions are related to macroscopic properties.

CH 613. Introductory Organic Chemistry for Teachers. 3 Hours.
A laboratory, lecture, demonstration course on the nature of carbon compounds including hydrocarbons, functional groups and their reactions. Emphasis given to laboratory experiments and demonstrations suitable for high school students.

CH 614. Introductory Biochemistry for Teachers. 3 Hours.
Lecture series covering carbohydrates, lipids, and proteins. Emphasis given to practical applications and relationship between chemistry and biology.

CH 615. Chemical Reactions and the Conservation of Mass for the 7-12 Classroom. 3 Hours.
Exploration of the types of intensive and extensive properties that allow scientists to identify a compound. Common chemical reaction types will be investigated, and activities showing how chemists use chemical equations to analyze and interpret reaction outcomes will be included. Exploration of the mathematical description of grams, moles, molecules, and atoms are presented. Solution concentration and the use of solutions in chemical reactions will also be investigated. Simple acid-base phenomena will be studied.

CH 616. Gases and the Kinetic Molecular Theory for the 7-12 Classroom. 3 Hours.
An exploration into the molecular level view of gases and how changes in pressure, temperature, and volume of a gas affect the particles of a gas. The mathematical relationships between these properties will be investigated. Applications of the Ideal Gas Law to real-world problems will be explored.

CH 617. Dynamic Equilibria for the 7-12 Classroom. 3 Hours.
The study of dynamic equilibria including the application of LeChatelier's Principle. Practical applications of LeChatelier's Principle and calculations related to the effects of these macroscopic changes on solution concentrations. Classroom investigations into gas phase, acid-base, and solubility equilibria will be included.

CH 619. Special Topics in Chemical Education. 3 Hours.
Topics determined by interest of students and faculty.

CH 625. Molecular Structure and Spectroscopy. 3 Hours.
Classical and quantum mechanical descriptions of molecular structure and bonding. Basic principles and techniques of molecular spectroscopic methods. Exercises and experiments with computational software and spectroscopic instrumentation will be conducted.

CH 629. Special Topics in Physical Chemistry. 3 Hours.
Topics determined by interest of s students and faculty. Typical are computational chemistry, molecular spectroscopy, nuclear magnetic resonance. Topics determined by interest of students and faculty.
Prerequisites: CH 600 [Min Grade: C]

CH 630. Physical Organic Chemistry. 3 Hours.
Localized and delocalized chemical bonds, stereochemistry, acidity and basicity, determining organic mechanisms and structure. Fall.

CH 631. Organic Reactions and Their Mechanisms. 3 Hours.
Nucleophilic and electrophilic substitution, free radical substitutions, additions to carbon-carbon and carbon-hetero multiple bonds, elimination reactions. Prerequisite: Spring.
Prerequisites: CH 630 [Min Grade: C]

CH 632. Organic Reactions and Synthesis. 3 Hours.
Strategy of synthesis, carbon skeletal assembly, selective functional group interconversion, blocking groups, stereochemical control. Spring.
Prerequisites: CH 631 [Min Grade: C]

CH 633. Reactive Intermediates and Conservation of Bonding. 3 Hours.
Behavior of organic molecules in static and reactive situations. Spring.
Prerequisites: CH 631 [Min Grade: C]

CH 639. Special Topics in Organic Chemistry. 1-3 Hour.
Topics determined by interest of students and faculty.
Prerequisites: CH 327 [Min Grade: C]

CH 640. Bonding and Structure in Inorganic Compounds. 3 Hours.
Advanced treatment of bonding in main group and transition metal compounds, and a study of its relationship properties of compounds. Spring.
Prerequisites: CH 540 [Min Grade: C]

CH 642. Organometallic Chemistry and Catalysis. 3 Hours.
Study of transition metal organometallic compounds and their applications as homogeneous catalysts for organic and polymer syntheses. Summer (alternate years).
Prerequisites: CH 640 [Min Grade: C] or CH 740 [Min Grade: C]

CH 649. Special Topics in Inorganic Chemistry. 1-3 Hour.
Topics determined by interest of students and faculty.

CH 651. Chemometrics. 3 Hours.
Introduction to basic data analysis techniques that include testing hypotheses, establishing tendencies and correlations, experimental design, etc. This course is designed to provide a support to a research chemist in effectively solving everyday problems associated with production and interpretation of experimental data.

CH 652. Analytical Spectroscopy. 3 Hours.
Instrumentation and methodology used in modern analytical spectrometry. Emphasis and examples taken primarily from vibrational spectroscopy (infrared and Raman), however, principles are applicable to many types of spectrometric measurements. Physical theory, optical principles, experimental methodology, instrument design, and numerical data processing are covered.

CH 654. Multivariate Analysis in Analytical Chemistry. 3 Hours.
Theoretical and practical concepts of multivariate statistical methods applied to data obtained from analytical measurements, including advanced data analysis in experimental spectroscopy. Systematic evaluation of high-dimensional data sets through multivariate means of calibration and classification. The course is intended for graduate students in chemistry, or related fields such as the physical or biochemical sciences, or engineering, who wish to understand the application of informatics methods and numerical analysis techniques to complex data sets.

CH 656. Analytical Separations. 3 Hours.
Advanced treatment of distillation, extraction, gas chromatography, HPLC, TLC, and GC-MS.
Prerequisites: CH 551 [Min Grade: C]

CH 659. Special Topics in Analytical Chemistry. 3 Hours.
Introduction to thermally initiated physical and chemical processes in the condensed phase systems such as liquids, crystalline solids, and glasses (amorphous solids). The course covers the use of calorimetry, thermogravimetry, and thermomechanical methods for exploring thermodynamics and kinetics of crystallization, glass transition, solid-solid and helix-coil transitions, decomposition, polymerization, etc.

CH 660. Fundamentals of Biochemistry. 3 Hours.
Overview of biochemical principles; chemistry of aqueous solutions, biochemical building blocks including amino acids, carbohydrates, lipids, and nucleotides; structure and function of proteins, membranes and nucleic acids; enzyme kinetics. Catabolic and anabolic metabolism in biomolecules, regulation of metabolic processes.

CH 661. Biochemistry II. 3 Hours.
Biochemistry II: Structure and function of proteins, membranes, membrane proteins, and nucleic acids. Ligand binding and enzyme kinetics. Molecular genetics (replication, transcription, translation) and the control of gene expression and protein synthesis.

CH 663. Biochemistry Laboratory. 3 Hours.
Introduction to modern analytical techniques used for the isolation and characterization of biological macromolecules.

CH 664. Biophysical Chemistry. 3 Hours.
Common physical methods for understanding the structure and stability of macromolecules that include several spectroscopic, thermodynamic and computational methods. Underlying physical principle described, instrumentation discussed, and examples cited from the literature. Spring.

Prerequisites: CH 323 [Min Grade: C]

CH 665. Structural Biochemistry. 3 Hours.
Principles of macromolecular structure, emphasizing proteins, nucleic acids, and macromolecular assemblies. Computational methods used to teach principles and modeling software used for construction of computer models of proteins and nucleic acids. Lecture and computer Laboratory.

CH 669. Special Topics in Biochemistry. 3 Hours.
Detailed consideration of areas of special interest.
Prerequisites: CH 462 [Min Grade: C]

CH 670. Chemical Literature. 3 Hours.
Use of on-line literature and development of searching techniques.

CH 671. Medicinal Chemistry and Drug Discovery. 3 Hours.
Description. Emphasis on design strategies for small organic drugs using common macromolecular drug targets. Examples of successful design for clinically used drug classes will be presented. Prerequisites include undergraduate organic chemistry (CH235 and CH237) and undergraduate biochemistry (CH461) or equivalent. 999999.
Prerequisites: CH 325 [Min Grade: C] and CH 237 [Min Grade: C] and CH 461 [Min Grade: C]

CH 672. Chemistry of Natural Products. 3 Hours.
The principal focus of this course will be the introduction of synthesis and medicinal chemistry of natural products. Drugs discovery using natural products, with specific examples in the areas of antibacterials, anticancer, and analgesic drugs will be introduced. An overview of structural classes, biosynthetic pathways and application of asymmetric synthesis in the synthesis of specific examples from each class will be discussed. This course is intended for undergraduate students at the senior level.

CH 673. Electron Pushing and Total Synthesis. 3 Hours.
The advanced organic course is aimed to enhance students' comprehension of advanced organic chemistry theory and principles, and apply them to understand reaction mechanisms and tactic of total synthesis. It will cover different types of common organic reactions each week, for example, reactions involving anion intermediates, cation intermediates, rearrangement, photochemical process, carbonyl compounds, and other reactive intermediates. Using electron pushing for mechanistic reasoning will be emphasized.

CH 674. X-Ray Crystallography. 3 Hours.
Fundamental principles of X-ray crystallography. Students gain enough information to be able to collect meaningful data and analyze and refine structures. Students learn how to collect, process and and analyze x-ray data, focus on heavy atom phasing techniques and use state of the art software for refinement. Permission of instructor.

CH 677. Radiochemistry for the life sciences. 3 Hours.
This course is intended to act as an introduction to radiochemistry. It will cover production, instrumentation, and radiochemistry techniques to make use of radiotracers in the life sciences from basic biological and environmental applications to medical imaging and therapy.

CH 680. Polymer Chemistry I. 3 Hours.
Basic chemical principles of polymers with the focus on synthesis, characterization, and applications of synthetic and biological macromolecules. Includes laboratory. Prerequisites: undergraduate organic chemistry and permission of instructor. Concurrent enrollment in CH 580L is recommended.

CH 680L. Polymer Chemistry I Laboratory. 1 Hour.
Polymer Chemistry I Laboratory. Recommended with CH 680 lecture.

CH 681. Polymer Chemistry II. 3 Hours.
Fundamentals of chemical, physical, and molecular aspects of polymers in bulk and solutions. Prerequisites: undergraduate organic chemistry and permission of instructor. Concurrent enrollment in CH 680L is recommended.
Prerequisites: CH 680 [Min Grade: C]

CH 681L. Polymer Chemistry II Laboratory. 1 Hour.
Laboratory to accompany CH 681 (Polymer Chemistry II). Concurrent enrollment in CH 681 is recommended.

CH 683. Chemistry of Polymers and Polymeric Materials I. 3 Hours.
Basic chemical principles of polymers with the focus on synthesis, characterization, and applications of synthetic and biological macromolecules. No laboratory is required. This course sequence is for BME or Material Science Graduate Students. The laboratory accompanying Polymer Chemistry I is NOT required for these students.

CH 684. Polymer Chemistry II. 3 Hours.
Fundamentals of chemical, physical and molecular aspects of polymers in bulk and solutions. No laboratory is required. This course sequence is for BME or Material Science Graduate Students. The laboratory accompanying Polymer Chemistry II is NOT required for these students.

CH 689. Special Topics in Polymer Chemistry. 3 Hours.
Detailed consideration of areas of special interests in polymer chemistry.
Prerequisites: CH 580 [Min Grade: C] and CH 581 [Min Grade: C]

CH 691. Seminar. 1 Hour.
Seminars on current topics in chemical research.

CH 692. Seminar Presentation. 2 Hours.
Seminar given by graduate students on current topics in chemical research.

CH 698. Graduate Research. 1-12 Hour.
Prerequisite: Permission of graduate faculty member. Research hours.

CH 699. Thesis Research. 1-12 Hour.
Prerequisites: Admission to candidacy and permission of graduate faculty member. Must have approved 3 member committee and approved candidacy by the graduate dean before registering for 699.
Prerequisites: GAC M

CH 702. Principles of Chemical Instruction. 1 Hour.
Responsibilities of laboratory instructors, safety regulations, grading, teaching styles and formats, and instructional objectives. Prerequisite: Permission of instructor. Fall.

CH 715. Introductory Biochemistry for Teachers II. 3 Hours.
Lecture series covering vitamins, minerals, enzymes, biochemical energy and metabolism. Strong connections between chemistry and biology. Practical applications are emphasized.

CH 725. Molecular Structure and Spectrosocpy. 3 Hours.
Classical and quantum mechanical descriptions of molecular structure and bonding. Basic principles and techniques of molecular spectroscopic methods. Exercises and experiments with computational software and spectroscopic instrumentation will be conducted.

CH 729. Special Topics in Physical Chemistry. 3 Hours.
Topics determined by mutual student-faculty interest. Typical are computational chemistry, molecular spectroscopy, nuclear magnetic resonance.
Prerequisites: CH 700 [Min Grade: C]

CH 730. Physical Organic Chemistry. 3 Hours.
Localized and delocalized chemical bonds, stereochemistry, acidity and basicity, determining organic mechanisms and structure. Fall.

CH 731. Organic Reaction and Their Mechanisms. 3 Hours.
Nucleophilic and electrophilic substitution, free radical substitutions, additions to carbon-carbon and carbon-hetero multiple bonds, elimination reactions. Spring.

CH 732. Organic Reaction and Synthesis. 3 Hours.
Strategy of synthesis, carbon skeletal assembly, selective functional group interconversion, blocking groups, stereochemical control. Spring.
Prerequisites: CH 731 [Min Grade: C]

CH 733. Reactive Intermediates and Conservation of Bonding. 3 Hours.
Behavior of organic molecules in static and reactive situations. Spring.
Prerequisites: CH 731 [Min Grade: C]

CH 739. Special Topics in Organic Chemistry. 3 Hours.
Topics determined by interest of students and faculty.

CH 740. Bonding and Structure in Inorganic Compounds. 3 Hours.
Advanced treatment of bonding in main group and transition metal compounds, and a study of its relationship to the properties of compounds. Spring.
Prerequisites: CH 540 [Min Grade: C]

CH 742. Organometallic Chemistry and Catalysis. 3 Hours.
Study of transition metal organometallic compounds and their applications as homogeneous catalysts for organic and polymer syntheses. Summer (alternate years).
Prerequisites: CH 640 [Min Grade: C] or CH 740 [Min Grade: C]

CH 744. Inorganic Structure and Spectroscopy. 3 Hours.
This course will cover fundamental principles of inorganic structure and spectroscopy. Lecture topics will focus on major principles and theories governing inorganic structure of chemical compounds, and discussion of related physical analytical methods. Undergraduate inorganic chemistry is strongly recommended as a prerequisite.

CH 745. Fundamentals in Inorganic Chemistry. 3 Hours.
Fundmental concepts of inorganic chemistry, including electronic configuration, bonding theory, solid-state chemistry, reactivity, and catalysis.

CH 747. Fundamentals and Applications of Actinide Chemistry. 3 Hours.
Fundamentals and Application of Actinide Chemistry is intended to act as an introduction to 5f elements and their applications. Topics will include the chemistry of the actinide elements, radiochemistry of the nuclear fuel cycle, environmental actinide chemistry, nuclear forensics, and related areas. By the end of the semester, you should have a strong foundation in these areas, allowing you to pursue research in a number of related fields.

CH 749. Special Topics in Inorganic Chemistry. 1-3 Hour.
Topics determined by interest of students and faculty.

CH 751. Chemometrics. 3 Hours.
Introduction to basic data analysis techniques that include testing hypotheses, establishing tendencies and correlations, experimental design, etc. This course is designed to provide a support to a research chemist in effectively solving everyday problems associated with production and interpretation of experimental data.

CH 752. Analytical Spectroscopy. 3 Hours.
Instrumentation and methodology used in modern analytical spectrometry. Emphasis and examples taken primarily from vibrational spectroscopy (infrared and Raman), however, principles are applicable to many types of spectrometric measurements. Physical theory, optical principles, experimental methodology, instrument design, and numerical data processing are covered.

CH 754. Multivariate Analysis in Analytical Chemistry. 3 Hours.
Theoretical and practical concepts of multivariate statistical methods applied to data obtained from analytical measurements, including advanced data analysis in experimental spectroscopy. Systematic evaluation of high-dimensional data sets through multivariate means of calibration and classification. The course is intended for graduate students in chemistry, or related fields such as the physical or biochemical sciences, or engineering, who wish to understand the application of informatics methods and numerical analysis techniques to complex data sets.

CH 759. Special Topics in Analytical Chemistry. 3 Hours.
Topics of interest to faculty and students.

CH 760. Fundamentals of Biochemistry. 3 Hours.
Overview of biochemical principles; chemistry of aqueous solutions, biochemical building blocks including amino acids, carbohydrates, lipids, and nucleotides; structure and function of proteins, membranes and nucleic acids; enzyme kinetics. Catabolic and anabolic metabolism in biomolecules, regulation of metabolic processes.

CH 761. Biochemistry II. 3 Hours.
Biochemistry II: Structure and function of proteins, membranes, membrane proteins, and nucleic acids. Ligand binding and enzyme kinetics. Molecular genetics (replication, transcription, translation) and the control of gene expression and protein synthesis.

CH 763. Biochemistry Laboratory. 3 Hours.
Introduction to modern analytical techniques used for the isolation and characterization of biological macromolecules.

CH 764. Biophysical Chemistry. 3 Hours.
Common physical methods for understanding the structure and stability of macromolecules that include several spectroscopic, thermodynamic, and computational methods. Underlying physical principle described, instrumentation discussed, and examples cited from the literature. Spring.

Prerequisites: CH 325 [Min Grade: C]

CH 765. Structural Biochemistry. 3 Hours.
Principles of macromolecular structure, emphasizing proteins, nucleic acids, and macromolecular assemblies. Computational methods used to teach principles and modeling software used for construction of computer models of proteins and nucleic acids. Lecture and computer Laboratory.

CH 767. Advanced Biomolecular NMR spectroscopy: From Quantum Mechanics to Protein Dynamics. 3 Hours.
This course is designed for graduate students who use NMR as a major tool to study structure and dynamics of biomolecules. It covers quantum mechanics explanation of NMR, pulse programming, non-uniform sample, data processing, NMR dynamics at different time scales.

CH 768. Biochemistry and Biophysics Journal Club. 1 Hour.
Weekly journal literature seminar and discussion group for chemistry graduate students. Intended for students working in the fields of biochemistry and biophysics.

CH 769. Special Topics in Biochemistry. 1-3 Hour.
Detailed consideration of areas of special interest.
Prerequisites: CH 462 [Min Grade: C]

CH 770. Chemical Literature. 3 Hours.
Use of on-line literature and development of searching techniques.

CH 771. Medicinal Chemistry and Drug Discovery. 3 Hours.
Emphasis on the structure-based design strategies for small organic molecule drugs using common macromolecular drug targets. Students in CH 771 should have had undergraduate preparation including organic chemistry and biochemistry or the equivalent.

CH 772. Chemistry of Natural Products. 3 Hours.
The principal focus of this course will be the introduction of synthesis and medicinal chemistry of natural products. Drugs discovery using natural products, with specific examples in the areas of antibacterials, anticancer, and analgesic drugs will be introduced. An overview of structural classes, biosynthetic pathways and application of asymmetric synthesis in the synthesis of specific examples from each class will be discussed. This course is intended for undergraduate students at the senior level.

CH 773. Electron Pushing and Total Synthesis. 3 Hours.
The advanced organic course is aimed to enhance students' comprehension of advanced organic chemistry theory and principles, and apply them to understand reaction mechanisms and tactic of total synthesis. It will cover different types of common organic reactions each week, for example, reactions involving anion intermediates, cation intermediates, rearrangement, photochemical process, carbonyl compounds, and other reactive intermediates. Using electron pushing for mechanistic reasoning will be emphasized.

CH 774. X-Ray Crystallography. 3 Hours.
Fundamental principles of X-ray crystallography. Students gain enough information to be able to collect meaningful data and analyze and refine structures. Students learn how to collect, process and and analyze x-ray data, focus on heavy atom phasing techniques and use state of the art software for refinement. Permission of instructor.

CH 777. Radiochemistry for the life sciences. 3 Hours.
This course is intended to act as an introduction to radiochemistry. It will cover production, instrumentation, and radiochemistry techniques to make use of radiotracers in the life sciences from basic biological and environmental applications to medical imaging and therapy.

CH 780. Polymer Chemistry I. 3 Hours.
Basic chemical principles of polymers with the focus on synthesis, characterization, and applications of synthetic and biological macromolecules. Includes laboratory. Prerequisites: undergraduate organic chemistry and permission of instructor.

CH 780L. Polymer Chemistry I Laboratory. 1 Hour.
Polymer Chemistry I Laboratory.

CH 781. Polymer Chemistry II. 3 Hours.
Fundamentals of chemical, physical, and molecular aspects of polymers in bulk and solutions. Prerequisites: undergraduate organic chemistry and permission of instructor.
Prerequisites: CH 780 [Min Grade: C]

CH 781L. Polymer Chemistry II Laboratory. 1 Hour.
Laboratory to accompany CH 781 (Polymer Chemistry II).

CH 783. Chemistry of Polymers and Polymeric Materials I. 3 Hours.
Basic chemical principles of polymers with the focus on synthesis, characterization, and applications of synthetic and biological macromolecules. No laboratory is required. This course sequence is for BME or Material Science Graduate Students. The laboratory accompanying Polymer Chemistry I is NOT required for these students. Permission of instructor is required before registration.

CH 784. Chemistry of Polymers and Polymeric Materials II. 3 Hours.
Fundamentals of chemical, physical and molecular aspects of polymers in bulk and solutions. No laboratory is required. This course sequence is for BME or Material Science Graduate Students. The laboratory accompanying Polymer Chemistry II is NOT required for these students. Permission of instructor is required for registration.

CH 789. Special Topics in Polymer Chemistry. 3 Hours.
Detailed consideration of areas of special interests in polymer chemistry.
Prerequisites: CH 580 [Min Grade: C] and CH 581 [Min Grade: C]

CH 790. Introduction to Graduate Research. 1 Hour.
The purpose of this course is to acquaint incoming graduate student with departmental, school and university policies and procedures for conducting research and teaching undergraduate students. Pass/Fail.

CH 791. Seminar. 1 Hour.
Seminars on current topics in chemical research.

CH 792. Seminar Presentation. 2 Hours.
Seminar given by graduate students on current topics in chemical research.

CH 798. Non-Dissertation Research. 1-12 Hour.
Prerequisite: Permission of graduate faculty member.

CH 799. Dissertation Research. 1-12 Hour.
Prerequisite: Admission to candidacy and permission of graduate faculty member.Must have graduate dean's approval of 5 member committee. Must have IRB and graduate dean's approval of candidacy. Need at least 2 semesters of candidacy to graduate.
Prerequisites: GAC Z

Communication Studies

The Department of Communication Studies is concerned with human interaction and communication in all its forms. The Communication Studies Department provides research, teaching and service to enable students to develop understanding and skills in order to thrive in a global communication environment of unremitting change and increasing diversity. To this end the department offers an undergraduate major in Communication Studies, and graduate courses leading to a Master of Arts in Communication Management.

To obtain specific admissions requirements on how to apply to Graduate School, prospective students should visit this page: https://www.uab.edu/cas/communication/graduate-program

Master of Arts in Communication Management

The program requires a total of 36 semester hours. Of the 36, no more than 6 hours can be CM 699 (Plan I), no more than 6 hours can be CM 698 (Plan II), and no more than 6 hours can be CM 618 (both Plan I and Plan II). 6 hours of additional coursework may be taken in lieu of a Plan II project. A grade of A or B is required in each course to count toward the degree.

Accelerated Learning Opportunities

The Department of Communication Studies offers a Communication Management Master's (ABM) option for high-achieving undergraduate students. All CM Graduate classes may be used for undergraduate BA in Communication Studies through the ABM, excluding: CM 618, CM 675, CM 698, CM 699.

LINK to https://www.uab.edu/cas/communication/graduate

Plan I - 36 hours with Thesis

Requirements		Hours
Select 10 classes from list below [1,2]		30
CM 601	Foundations of Communication Management	
CM 602	Source Credibility	
CM 603	Message Construction	
CM 604	Analysis of Communication Audiences	
CM 605	Communication Effects	
CM 607	Seminar in Applied Communication Research	
CM 609	Communibiology	
CM 611	Seminar in Org Communication (DELETE)	
CM 612	Instructional Communication	
CM 613	Nonverbal Communication	
CM 614	Seminar: Political Communication	
CM 615	Intercultural Communication	
CM 616	Health and Med Communication	
CM 617	Training and Development in Communication	
CM 618	Communications Independent Study	
CM 619	Communication and the Law	
CM 620	Persuasion	
CM 621	Seminar in Small Group Dynamics	
CM 622	Interpersonal Communication and Relationships	
CM 623	Deception	
CM 624	Special Topics in Communication Theory and Research	
CM 630	Seminar in Research Classics	
CM 675	Graduate Internship	
CM 690	Communication Theory	
CM 691	Seminar in Communication Models	
CM 694	Quantitative Communication Research	
CM 695	Data Analysis for Quantitative Communication Research	
CM 696	Qualitative Communication Research	
Thesis Research		**6**
CM 699	Thesis Research	
Thesis		
Total Hours		**36**

Plan II - 36 hours with Comprehensive Exam

Requirements		Hours
Select 10 classes from list below [1,2]		30
CM 601	Foundations of Communication Management	
CM 602	Source Credibility	
CM 603	Message Construction	
CM 604	Analysis of Communication Audiences	
CM 605	Communication Effects	
CM 607	Seminar in Applied Communication Research	
CM 609	Communibiology	
CM 611	Seminar in Org Communication (DELETE)	
CM 612	Instructional Communication	
CM 613	Nonverbal Communication	
CM 614	Seminar: Political Communication	
CM 615	Intercultural Communication	
CM 616	Health and Med Communication	
CM 617	Training and Development in Communication	
CM 618	Communications Independent Study	

CM 619	Communication and the Law	
CM 620	Persuasion	
CM 621	Seminar in Small Group Dynamics	
CM 622	Interpersonal Communication and Relationships	
CM 623	Deception	
CM 624	Special Topics in Communication Theory and Research	
CM 630	Seminar in Research Classics	
CM 675	Graduate Internship	
CM 690	Communication Theory	
CM 691	Seminar in Communication Models	
CM 694	Quantitative Communication Research	
CM 695	Data Analysis for Quantitative Communication Research	
CM 696	Qualitative Communication Research	
Master's Applied Project		6
CM 698	Master's Applied Project	
Comprehensive Exam		
Total Hours		**36**

1 Up to 6 hours graduate work may be transferred from an accredited graduate program (Non-UAB) with approval from the Graduate Director.

2 Up to 6 hours of graduate work (600 or above) in another department at UAB may be applied with approval of the Graduate Director.

Courses

CM 601. Foundations of Communication Management. 3 Hours.
Development of communication models, relationships between models and research, examination of functions of models and their impact on human communication in various media. 999999.

CM 602. Source Credibility. 3 Hours.
Theories of ethos, dynamics of credibility in public speaking, organizational, interpersonal, print and broadcasting contexts. Measures of credibility and methods for constructing credibility.

CM 603. Message Construction. 3 Hours.
Features of communication messages, including audience, situation, and culture and their impact on message construction. The principles underlying the creation of messages in various media.

CM 604. Analysis of Communication Audiences. 3 Hours.
Analysis of the audience and its place in the communication model. Includes needs and gratification from various media as well as how messages and feedback are interpreted.

CM 605. Communication Effects. 3 Hours.
Effects of Communication, especially through mass media, as a result of messages transmitted. Topics include violence, persuasion, and sexuality.

CM 607. Seminar in Applied Communication Research. 3 Hours.
Topics include interpersonal communication, small group communication, organizational communication, and political communication.

CM 611. Seminar in Org Communication. 3 Hours.

CM 612. Instructional Communication. 3 Hours.
Communication problems in the classroom. Definition of sign and sign process. Signs in communicative action.

CM 613. Nonverbal Communication. 3 Hours.
Elements of nonverbal behavior (physical appearance, gestures, space, voice) which affect communication in person-to-person situations.

CM 614. Seminar: Political Communication. 3 Hours.
Seminar.

CM 615. Intercultural Communication. 3 Hours.
This class provides students with a theoretical understanding of intercultural communication as well as the ability to apply these intercultural communication concepts, theories, and models to practice.

CM 616. Health Communication. 3 Hours.
This course provides students with a comprehensive understanding of health communication. The course encompasses how to communicate health-related information to targeted audiences and provides an overview of several behavior change theories that are frequently adopted in health contexts.

CM 617. Training and Development in Communication. 3 Hours.
Training and Development in Communication focuses on contemporary communication knowledge and skills that every trainer should have. The class will include topics such as: Designing Curricula, Training Content, Methods, Plans, Sessions, Assessment, and Career Opportunities.

CM 618. Communications Independent Study. 1-6 Hour.
Independent Study. Topics of mutual interest to student and faculty member.

CM 619. Communication and the Law. 3 Hours.
Communication and the Law focuses on general effects communication has in the law environment. Conflict, leadership, and use of the law will be considered.

CM 620. Persuasion. 3 Hours.
Current theories and research in the area of attitude formation and change will be explored in this class.

CM 621. Seminar in Small Group Dynamics. 3 Hours.
Current theories and research in small group communication dynamics will be explored in this class. The class will include topics such as: Leadership, Decision-making, conflict and conformity.

CM 622. Interpersonal Communication and Relationships. 3 Hours.
This class introduces students to interpersonal communication concepts, theories, and research and their broad applications to personal and professional relationships. A variety of theories and research are reviewed and applied to relationships in health, organizational, educational, and romantic contexts.

CM 623. Deception. 3 Hours.
This course examines theory and research on the topic of human deception from the perspective of Truth Default Theory. Topics include verbal and nonverbal aspects of deception, prevalence of deception, deception motives, information manipulation, truth-bias, and improving accuracy.

CM 624. Special Topics in Communication Theory and Research. 1-6 Hour.
Various topics selected by faculty.

CM 630. Seminar in Research Classics. 3 Hours.
Students read and discuss seminal works in Communication and social science.

CM 675. Graduate Internship. 3 Hours.
Professional experience in communication management.

CM 690. Communication Theory. 3 Hours.
The class will introduce students to communication theory providing an introduction to theory construction as well as an overview of several prominent communication theories.

CM 694. Quantitative Communication Research. 3 Hours.
The study of communication theory from a quantitative perspective. Data gathering, experimental and quasi-experimental design, field research and data analysis in applied contexts to be probed.

CM 695. Data Analysis for Quantitative Communication Research. 3 Hours.
This class introduces students to basic descriptive and inferential data analysis techniques in communication studies research.

CM 696. Qualitative Communication Research. 3 Hours.
Study of communication theory from a qualitative perspective. Historical/critical, participant-observation, and various data gathering methods and models explored from a theoretical and practical point of view.

CM 698. Master's Applied Project. 3-6 Hours.
Master s Applied Project.

CM 699. Thesis Research. 3-6 Hours.
Thesis Research.
Prerequisites: GAC M

Computer Science

To obtain specific admissions requirements on how to apply to Graduate School, prospective students should visit this page: http://www.uab.edu/graduate/admissions

Degree Offered:	Ph.D., M.S.
Contact Us:	csgradprogram@uab.edu
Website:	http://www.uab.edu/cas/computerscience/graduate-programs

Program Information

The field of computer science deals with theory and methods for processing of information. Graduate programs leading to the M.S. and Ph.D. degrees are designed to prepare individuals for professional and research-level careers in industry, government, and academia. Prospective students should have substantial background in computer science and mathematics.

M.S. Programs

We offer M.S. degrees in both Computer Science and Data Science. CS and CJ (Dept. of Criminal Justice) also jointly offer the MS in Cyber Security. For details, please check the Cyber Security catalog.

Ph.D. Program

The Ph.D. program consists of three phases (with some overlap between phases). The first phase of the program is devoted primarily to formal coursework and preparation for the qualifying examination. The second phase consists of coursework and research in preparation for the comprehensive examination. This examination requires presentation of a dissertation research proposal. Successful completion of this phase leads to admission to candidacy. The final phase is the completion of the dissertation research and its defense. Ph.D. student progress will be reviewed annually.

Contact Information

For detailed information, after first visiting the website below for basic information including application guidelines and prerequisites, contact Dr. Chengcui Zhang (czhang02@uab.edu, MS Program Director) for MS-program related questions and for Ph.D.-program related questions.

Website: http://www.uab.edu/cas/computerscience/graduate-programs

Master of Science in Computer Science

Plan 1 - 30 hours with Thesis

Requirements		Hours
Select 24 credit hours of CS courses and approved non-CS electives at the 500+ level [1,2]		**24**
Allowed Electives from other disciplines (up to 3 chrs)		
MA 660	Numerical Linear Algebra [3]	
MA 668	Numerical Analysis I [3]	
or		
MA 669	Numerical Analysis II [3]	
CS 699	Master's Thesis Research	6
Total Hours		**30**

Plan II - 30 hours

Requirements		Hours
Select 30 credit hours of CS courses and approved non-CS electives at the 500+ level [1,2]		**30**
Allowed Electives from other disciplines (up to 3 chrs)		
MA 660	Numerical Linear Algebra [3]	
MA 668	Numerical Analysis I [3]	
or		
MA 669	Numerical Analysis II [3]	
Total Hours		**30**

1 No more than three (9 credit hours of) 500 level courses can count towards the MS degree.
2 No more than 3 combined credit hours of special courses (CS 697 or CS 598) can count towards the MS degree. CS 598 also counts towards the 9 credit hours of 500 level course allowance.
3 May substitute any other graduate level course approved by the graduate program director

Master of Science in Data Science

Plan I

Requirements		Hours
Core		**12**
CS 510	Database Application Development	
or CS 610	Database Systems	
CS 652	Advanced Algorithms and Applications	
CS 667	Machine Learning	
CS 685	Foundations of Data Science	
or CS 680	Matrix Algorithms for Data Science	
Electives [1]		**12**
Data Analytics		
CS 616	Big Data Programming	
CS 660	Artificial Intelligence	
CS 662	Natural Language Processing	
CS 663	Data Mining	
CS 665	Deep Learning	
CS 673	Computer Vision and Convolutional Neural Networks	

CS 675	Data Visualization	
CS 680	Matrix Algorithms for Data Science	
CS 687	Complex Networks	
CS 555	Probability & Statistics in Computer Science	
Cyber Security		
CS 636	Computer Security	
CS 623	Network Security	
CS 645	Modern Cryptography	
CS 643	Cloud Security	
High Performance Computing		
CS 632	Parallel Computing	
CS 633	Cloud Computing	
Digital Forensics		
CS 519	Investigating Online Crimes	
CS 537	Digital Media Forensics	
CS 689	Cyber Risk Management	
Non-Computer Science Electives [2]		
Biostatistics		
BST 611	Intermediate Statistical Analysis I	
BST 612	Intermediate Statistical Analysis II	
BST 621	Statistical Methods I	
BST 622	Statistical Methods II	
Bioinformatics		
INFO 601	Introduction to Bioinformatics	
INFO 602	Algorithms in Bioinformatics	
INFO 603	Biological Data Management	
Business Intelligence		
MBA 617	Data Science for Business	
MBA 658	Applied Marketing Research	
MBA 662	Quantitative Analysis for Business Managers	
Other CS Graduate Electives		
Any other CS 500 or 600 level course		
Thesis Research		**6**
CS 699	Master's Thesis Research	
Total Hours		**30**

Plan II

Requirements		Hours
Core		**12**
CS 510	Database Application Development	
or CS 610	Database Systems	
CS 652	Advanced Algorithms and Applications	
CS 667	Machine Learning	
CS 685	Foundations of Data Science	
or CS 680	Matrix Algorithms for Data Science	
Electives [1]		**18**
Data Analytics		
CS 616	Big Data Programming	
CS 660	Artificial Intelligence	
CS 662	Natural Language Processing	
CS 663	Data Mining	
CS 665	Deep Learning	
CS 673	Computer Vision and Convolutional Neural Networks	
CS 675	Data Visualization	
CS 680	Matrix Algorithms for Data Science	
CS 687	Complex Networks	
CS 555	Probability & Statistics in Computer Science	
Cyber Security		
CS 636	Computer Security	
CS 623	Network Security	
CS 645	Modern Cryptography	
CS 643	Cloud Security	
High Performance Computing		
CS 632	Parallel Computing	
CS 633	Cloud Computing	
Digital Forensics		
CS 519	Investigating Online Crimes	
CS 537	Digital Media Forensics	
CS 689	Cyber Risk Management	
Non-Computer Science Electives [2]		
Biostatistics		
BST 611	Intermediate Statistical Analysis I	
BST 612	Intermediate Statistical Analysis II	
BST 621	Statistical Methods I	
BST 622	Statistical Methods II	
Bioinformatics		
INFO 601	Introduction to Bioinformatics	
INFO 602	Algorithms in Bioinformatics	
INFO 603	Biological Data Management	
Business Intelligence		
MBA 617	Data Science for Business	
MBA 658	Applied Marketing Research	
MBA 662	Quantitative Analysis for Business Managers	
Other CS Graduate Electives		
Any other CS 500 or 600 level course		
Total Hours		**30**

1 No more than three combined credit hours of special courses (CS 697: Directed Readings or CS 598: Practical Work Experience) can count towards the MSDS degree. No more than three (9 credit hours of) 500 level courses can count towards the MSDS degree (CS 598 also counts towards this limit.)

2 Students may take up to three (9 credit hours of) non-CS electives upon the approval of the graduate program director.

Graduate Certificate in Cyber Security Analytics

Requirements		Hours
CS 623	Network Security	3
CS 636	Computer Security	3
CS 663	Data Mining	3
CS 667	Machine Learning	3
CS 598	Practical Work Experience	3
Total Hours		**15**

Ph.D. in Computer Science

Ph.D. students must meet the minimum course credit requirement of UAB Graduate School and may take any course from our graduate catalog and any graduate course approved by their dissertation advisor and the graduate program director.

Degree Requirements:

The program consists of three phases or levels. Level 1 is devoted primarily to formal CS coursework and preparation for a written survey and critique covering the breadth of a research area and an oral presentation of the work. Level 2 consists of additional CS coursework and research in preparation for the comprehensive examination, which requires presentation of a dissertation research proposal. Successful completion of this phase leads to admission to candidacy. The final phase (Level 3) is the completion of the dissertation research and its defense.

There is a residency requirement of at least one consecutive academic year of full-time study.

Requirements		Hours
Computer Science Courses		
Select 45 hours from the Computer Science courses at the graduate level (24 hours if entering with a master's degree appropriate to CS field)		45
GRD 717	Principles of Scientific Integrity	3
Dissertation		**24**
CS 799	Dissertation Research	
Total Hours [1]		

[1] **72 hours** (if entering with a baccalaureate degree)
51 hours (if entering with a master's degree)

Courses

CS 500. Advanced Object-Oriented Programming in C++. 3 Hours.
Object-oriented programming concepts in C++ including templates, multiple inheritance, const correctness. Types, streams, containers, references, pointers, iterators, lambdas, operator overloading, evolution of C++ in C++11/14/17/20, using the Standard Template Library (STL). Current techniques and tools for software development in C++: unit testing, compilation, version control using git, numerical libraries, linters, and generating documentation from annotated C++ sources.

CS 500L. Advanced Object-Oriented Programming in C++ Lab. 0 Hours.
Laboratory to accompany CS500.

CS 501. Programming Paradigms. 3 Hours.
The course will introduce students to major programming paradigms, such as functional programming and logic programming, and their realization in programming languages. Students will solve problems using different paradigms and study the impact on program design and implementation. The course enables students to assess strengths and weaknesses of different languages for problem solving. Other topics to be covered include lexing, parsing, type systems, and ways to formalize a language's semantics.

CS 501L. Programming Paradigms Laboratory. 0 Hours.
Laboratory to accompany CS501.

CS 510. Database Application Development. 3 Hours.
Relational model of databases, structured query language, relational database design and application development, database normal forms, and security and integrity of databases.

CS 519. Investigating Online Crimes. 3 Hours.
Introduction to cyber-investigative techniques involving network forensics. Students will develop and learn to apply new programs and techniques to automatically evaluate digital evidence from network packet captures, emails, server logs, social media, darknets and online forums related to cyber crime cases from both a law enforcement and incident response perspective.

CS 520. Software Engineering. 3 Hours.
Design and implementation of large-scale software systems, software development life cycle, software requirements and specifications, software design and implementation, verification and validation, project management and team-oriented software development.

CS 520L. Software Engineering Laboratory. 0 Hours.
Laboratory to accompany CS520.

CS 522. Mobile Application Development. 3 Hours.
Fundamental concepts of mobile application development. Focused on native application development for Android and iOS. Understand application architecture and lifecycle best practices. UX considerations for mobile devices. Interact with device sensors. Compare native vs hybrid frameworks. This course has a laboratory component.

CS 522L. Mobile App Development Lab. 0 Hours.
Laboratory to accompany CS522.

CS 532. Systems Programming. 3 Hours.
Unix architecture and internals with an emphasis on Linux, shell scripting, distributions of Linux for various computing platforms including large and desktop computers, and embedded computing devices, introduction to the C programming language, systems programming in C covering signals and process control, networking, I/O, concurrency and synchronization, memory allocation, threads, debugging, library development and usage.

CS 532L. Systems Programming Lab. 0 Hours.
Laboratory to accompany CS532.

CS 533. Operating Systems. 3 Hours.
Internal design and operation of a modern operating system, including interrupt handling, process scheduling, memory management, virtual memory, demand paging, file space allocation, file and directory management, file/user security and file access methods. Computer Networks.

CS 533L. Operating Systems Laboratory. 0 Hours.
Laboratory to accompany CS 533.

CS 534. Networking. 3 Hours.
Underlying network technology, including IEEE 802.11. Interconnecting networks using bridges and routers. IP addresses and datagram formats. Static and dynamic routing algorithms. Control messages. Subnet and supernet extensions. UDP and TCP. File transfer protocols. E-mail and the World Wide Web. Network address translation and firewalls. Mandatory weekly Linux-based lab.

CS 534L. Networking Laboratory. 0 Hours.
Project oriented hands-on approach.

CS 537. Digital Media Forensics. 3 Hours.
Digital media forensics addresses all stored digital evidence types faced by cyber security professionals and computer forensics examiners. Students will learn to analyze character encoding, file formats, and digital media, including hard drives, smartphones and other portable devices, and cloud-hosted evidence, as well as disk acquisition, duplication and evidence preservation techniques and how to apply these techniques in typical criminal investigation scenarios.

CS 537L. Digital Media Forensics Lab. 0 Hours.
Laboratory to accompany CS 537.

CS 538. Exploring the Dark Web. 3 Hours.
The course provides an in-depth exploration of the advanced technical architecture, tools, and analysis techniques used in the Dark Web. Students will gain a comprehensive understanding of the underlying network and computing infrastructure of the Dark Web, explore various tools and technologies used by threat actors, and learn techniques for analyzing activities and transactions on the Dark Web and gathering intelligence through artificial intelligence tools.

CS 550. Automata and Formal Language Theory. 3 Hours.
Finite-state automata and regular expressions, context-free grammars and pushdown automata, turing machines, computability and decidability, and complexity classes.

CS 555. Probability & Statistics in Computer Science. 3 Hours.
Introduction to Probability and Statistics with applications in Computer Science. Counting, permutations and combinations. Probability, conditional probability, Bayes Theorem. Standard probability distributions. Measures of central tendency and dispersion. Central Limit Theorem. Regression and correlation. Hypothesis testing. Random number generation. Random algorithms. Estimating probabilities by simulation. Genetic algorithms.

CS 591. Special Topics. 1-3 Hour.
Selected Topics in Computer Science.

CS 592. Special Topics. 1-3 Hour.
Selected Topics in Computer Science.

CS 597. Competitive Programming Techniques. 1 Hour.
This course will help students become more competitive in a programming competition such as the ACM programming contest by exploring numerous problem solving techniques and algorithms not covered in the traditional curriculum.

CS 598. Practical Work Experience. 1-9 Hour.
Credit for working in the Computer Science field.

CS 600. Formal Semantics of Programming Languages. 3 Hours.
Context-sensitive and semantic aspects of programming languages, denotational semantics, mathematical foundations.

CS 601. Program Verification. 3 Hours.
Proving properties of programs, termination and correctness, computability and decidability, role of formal methods in software design.

CS 602. Compiler Design. 3 Hours.
Lexical and syntactical scan, semantics, code generation and optimization, dataflow analysis, parallelizing compilers, automatic compiler generation, and other advanced topics.

CS 610. Database Systems. 3 Hours.
This course offers an introduction to the advanced topics of database management systems. The following topics are addressed: System and file structure, efficient data manipulation using indexing and hashing, query processing, crash recovery, concurrency control, transaction processing, database security and integrity, distributed databases.

CS 613. Emerging Database Technologies. 3 Hours.
This course explores new technological and theoretical foundations for storing and organizing data for "Big Data" applications. Topics include emerging database technologies for high-velocity transaction processing, stream processing, real time analytics, and high-volume data processing. The discussions will focus on several real-world application domains, such as Internet advertising, health care, and social network analysis.

CS 614. Distributed Database Systems. 3 Hours.
Concepts of Distributed Database Systems and Architectures, Distributed Database Design, Distributed Query Processing and Optimization, Transaction Management and Concurrency Control, Heterogeneous and Multidatabase Systems.

CS 615. Multimedia Databases. 3 Hours.
This course introduces the principles of multimedia databases including multimedia information processing, modeling, and retrieval. The media to be considered include text, image, audio and video. At the conclusion of this course, the students should understand what multimedia data retrieval is, the principles, which allow the location of relevant information from amongst a large corpus of multimedia data, and the applications of multimedia information retrieval. The students should also have the expertise and competence to design and implement retrieval software for multimedia data.

CS 616. Big Data Programming. 3 Hours.
Introduction to Big Data, Properties of Big Data, platforms, programming models, applications, business analytics programming, big data processing with Python, R, and SAS, MapReduce programming with Hadoop.

CS 617. Database Security. 3 Hours.
Database fundamentals, introduction to database security, overview of security models, access control models, covert channels and inference channels, MySQL security, Oracle security, Oracle label security, developing a database security plan, SQL server security, security of statistical databases, security and privacy issues of data mining, database applications security, SQL injection, defensive programming, database intrusion prevention, audit, fault tolerance and recovery, Hippocratic databases, XML security, network security, biometrics, cloud database security, big database security.

CS 620. Software Design and Integration. 3 Hours.
This course provides hands-on experience in the design and integration of software systems. Component-based technology, model-driven technology, service-oriented technology, and cloud technology are all explored. Software design basics, including the decomposition of systems into recognizable patterns, the role of patterns in designing software and design refactoring, and attributes of good design. Agile culture, CASE tools, tools for continuous integration, build, testing, and version control.

CS 621. Advanced Web Application Development. 3 Hours.
Introduction to web application design and development. Includes traditional web applications utilizing server-side scripting as well as client/server platforms. Covers responsive design for both mobile and desktop users, as well as hands on server provisioning and configuration. Other topics include web security problems and practices, authentication, database access, application deployment and Web API design, such as REpresentational State Transfer (REST).

CS 621L. Advanced Web Application Development Laboratory. 0 Hours.
Laboratory to accompany CS621.

CS 622. Reflective and Adaptive Systems. 3 Hours.
This course examines the principles of compile-time and run-time adaptation in several contexts, including: reflection, metaprogramming, aspect-oriented software development, and metamodeling (applied to model-driven engineering).

CS 623. Network Security. 3 Hours.
Conventional network security (symmetric and public-key cryptography). Message encryption and authentication. Secure communication between computers in a hostile environment, including E-mail (PGP), virtual private networks (IPSec), remote access (SSH), and E-commerce (SSL), firewalls, intrusion detection and prevention, security of IEEE 802.11 wireless networks (WEP, WPA). Mandatory weekly Linux-based lab.

CS 623L. Network Security Laboratory. 0 Hours.
Laboratory to accompany CS 623.

CS 624. Formal Specification of Software Systems. 3 Hours.
Formal methods for software requirements specification, including VDM, Z, and object-oriented extensions; the relationship among formal requirements, design, and implementation.

CS 625. Metrics and Performance. 3 Hours.
Theory and practice of metrics for performance and scalability of software systems. The course will introduce students to the principles of queuing theory and statistical analysis relevant to analyzing the performance of software products. Students will use profiling frameworks to identify a range of performance problems in existing software. The course will enable students to improve the design of software and eliminate many common design oversights that hamper a system's performance and scalability.

CS 626. Secure Software Development. 3 Hours.
Why and how software fails, characteristics of secure and resilient software, life cycle of secure software development, metrics and models for secure software maturity, design methodology, best practices for secure programming, secure software for mobile computing, cloud computing and embedded systems, methodology for testing and validation.

CS 629. GPU Programming. 3 Hours.
GPU architecture, GPU programming models, GPU parallel algorithms, GPU communication models, GPU performance optimizations, GPU debugging, GPU libraries, multi-GPU program design, and applications of GPU computing.

CS 629L. GPU Programming Lab. 0 Hours.
Laboratory to accompany CS629 GPU Programming.

CS 630. Computer Architecture. 3 Hours.
Introduction to computer architecture, including memory subsystems, direct-mapped and set-associative cache and multi-level cache subsystems, direct-access devices including RAID and SCSI disk drives, processor pipelining including super-scalar and vector machines, parallel architectures including SMP, NUMA and distributed memory systems, Interrupt mechanisms, and future microprocessor design issues.

CS 631. Distributed Systems. 3 Hours.
Object-oriented distributed systems design, distributed software architecture, data and resource access, communication, client-server computing, web technologies, enterprise technologies.

CS 632. Parallel Computing. 3 Hours.
Overview of parallel computing hardware, architectures, & programming paradigms; parallel programming using MPI, Ptureads, and OpenMP; design, development, and analysis of parallel algorithms for matrix computations, FFTs, and Sorting.

CS 633. Cloud Computing. 3 Hours.
Introduction to cloud computing architectures and programming paradigms. Theoretical and practical aspects of cloud programming and problem-solving involving compute, storage and network virtualization. Design, development, analysis, and evaluation of solutions in cloud computing space including machine and container virtualization technologies.

CS 633L. Cloud Computing Lab. 0 Hours.
Laboratory to accompany CS633.

CS 634. Virtualization. 3 Hours.
Theory and practice of virtualization. Origins, history, technical and economic motivations. Relationship to network operating systems and operating system architecture. Simulation, Emulation, Virtualization of CPUs, networks, storage, desktops, memory, devices, and combinations thereof. Different approaches to virtualization, including hardware assists and software-only techniques. Techniques, approaches, and methodologies for scale-out and scale-up computing, including security, performance and economic concerns.

CS 635. Network Programming. 3 Hours.
Remote procedure call and client-server mechanisms. Protocol definition and compilation; client and server stubs and application code; transport independence; multiple client and server systems. Applications, e.g., remote database query and update and image filtering and archiving; systems programming and file systems contexts.

CS 636. Computer Security. 3 Hours.
Study of the breadth of major computer security topics including cyber threats, malware, information assurance, authorization, applied cryptography, web security, mobile and wireless security, network security, systems/software security, database and storage security, user-centered security, and best security practices and countermeasures.

CS 640. Foundations in Bioinformatics. 3 Hours.
Foundations in bioinformatics, emphasizing the application of computational tools and methodology in genomics, analysis of protein functions and structures, and DNA sequencing. Students learn how to use a high level programming language such as Python together with software tools such as BLAST and ArrayTrack to solve bioinformatics problems.

CS 641. Algorithms in Bioinformatics. 3 Hours.
This course covers the design and analysis of algorithmic techniques applied in bioinformatics. Topics include sequence comparison, alignment and matching, suffix tree, sequence database search, phylogenetic tree, genome rearrangement, motif finding, RNA prediction, and peptide sequencing.
Prerequisites: CS 640 [Min Grade: B]

CS 642. Mobile and Wireless Security. 3 Hours.
Mobile/wireless devices are ubiquitous, raising the potential for many cyber threats. This course examines security vulnerabilities inherent in many existing and emerging mobile and wireless systems, ranging from smartphones to wearables and RFID tags. In addition to exposing security vulnerabilities, defensive mechanisms to address these vulnerabilities drawn from existing deployments and research literature will be studied.

CS 643. Cloud Security. 3 Hours.
Definition of cloud computing, cloud computing models, privacy, authenticity and integrity of outsourced data, proof of data possession / retrievability, cloud forensics, malware analysis as a service, remote verification of capability and reliability, proof of availability, economic attacks on clouds and outsourced computing, virtual machine security, trusted computing technology and clouds, verifiable resource accounting, cloud-centric regulatory compliance issues and mechanisms, business and security risk models, secure MapReduce, applications of secure cloud computing, private information retrieval and cloud cartography.

CS 645. Modern Cryptography. 3 Hours.
Theory and practices of modern cryptographic techniques, algorithms and protocols, including formal analysis. Secret key encryption algorithms, public key encryption algorithms, stream ciphers, one-way hashing algorithms, authentication and identification, digital signatures, signcryption, key establishment and management, secret sharing and data recovery, zero-knowledge proofs, public key infrastructures, efficient implementation, cryptanalytic attacks and countermeasures, security models, assumptions and proofs.

CS 646. Blockchain and Cryptocurrency. 3 Hours.
Fundamental principles of blockchains and their applications in digital cash systems including Bitcoin, Ethereum and other notable cryptocurrencies. Topics to be covered include how a cryptocurrency works, blockchain and other decentralized consensus protocols, proof of work, proof of stake, smart contracts, security and privacy of cryptocurrencies, cryptographic techniques for digital currency, and applications of blockchain in peer-to-peer trust establishment, digital asset management, financial exchanges and distributed autonomous organization.

CS 647. Biomedical Modeling. 3 Hours.
Modeling from biomedical datasets. Acquisition, segmentation; registration and fusion; construction of shame models; measurement; illustration modeling techniques for surgical planning.

CS 650. Theory of Computation. 3 Hours.
Topics include Turing machines, computability, computational complexity, complexity classes, P vs. NP, circuit complexity, randomized computation, interactive proofs, quantum, decidability, primality testing, and other computational models.

CS 651. Formal Language Theory. 3 Hours.
Parsing and translation theory, formal syntax, proof properties and complexity measures.

CS 652. Advanced Algorithms and Applications. 3 Hours.
The design and analysis of fundamental algorithms that underpin many fields of importance ranging from data science, business intelligence, finance and cyber security to bioinformatics. Algorithms to be covered include dynamic programming, greedy technique, linear programming, network flow, sequence matching, search and alignment, randomized algorithms, page ranking, data compression, and quantum algorithms. Both time and space complexity of the algorithms are analyzed.

CS 653. Computational Geometry. 3 Hours.
Basic methods and data structures, geometric searching, convex hulls, proximity, intersections.

CS 654. Malware Analysis. 3 Hours.
Hands-on course teaching static, dynamic and contextual analysis of malware. Malware analysis and reverse-engineering techniques are taught through interaction with both "classroom" and "wild" malware samples. Defensive and counter-measure techniques for both corporate and law enforcement environments are explored.

CS 654L. Malware Analysis Lab. 0 Hours.
Laboratory to accompany CS 654.

CS 655. Quantum Computing. 3 Hours.
Quantum mechanics, mathematical foundations, quantum gates, quantum circuits, quantum computer, quantum programming, quantum algorithms, quantum computing methods, and applications of quantum computing.

CS 656. Web Security. 3 Hours.
The web uses advanced applications that run on a large variety of browsers that may be built using programming languages such as JavaScript, AJAX, Google Web Toolkit and Apache Struts, to name a few. This course studies how core web technologies work, the common security vulnerabilities associated with them, and how to build secure web applications that are free from these vulnerabilities.

CS 657. Penetration Testing and Vulnerability Assessment. 3 Hours.
This course focuses on penetration testing and vulnerability analysis. It introduces methodologies, techniques and tools to analyze and identify vulnerabilities in stand-alone and networked applications. It also covers methodologies for legal and standards compliance.

CS 659. Multiprocessor Programming. 3 Hours.
This course examines synchronization in concurrent systems, available atomic primitives, non-blocking programming techniques, lock-/wait-freedom, transactional memory, and memory models in hardware and software. The application of these techniques to the development of scalable data structures for multi-core architectures will be a central topic of this course.

CS 660. Artificial Intelligence. 3 Hours.
Programming methodologies, logic foundations, natural language applications, expert systems.

CS 662. Natural Language Processing. 3 Hours.
This course provides a broad introduction to Natural Language Processing (Computational Linguistics) and its applications. Topics covered include language modeling with neural networks, sequence labelling algorithms (segmentation, chunking, tokenization, part-of-speech tagging and others), syntactic and dependency parsing, vector-based representation models and using Deep Learning in NLP applications. Some application areas covered include information extraction and named entity recognition, semantic role labelling, word sense disambiguation, text generation, information retrieval, question answering, machine translation and other areas as time permits. There will be a focus on Deep Learning approaches using Tensorflow, PyTorch and keras for a major student project. Jupyter Notebooks will be used for assignments.

CS 663. Data Mining. 3 Hours.
Techniques used in data mining (such as frequent sets and association rules, decision trees, Bayesian networks, classification, clustering), algorithms underlying these techniques, and applications.

CS 665. Deep Learning. 3 Hours.
Deep Learning is a rapidly growing area of machine learning that has revolutionized speech recognition, image recognition and natural language processing. This course teaches you deep learning basics such as logistic regression, stochastic gradient descent, deep neural networks, convolutional neural networks and deep models for text and sequences. Students will also gain hands-on experience of using deep learning systems such as TensorFlow.

CS 667. Machine Learning. 3 Hours.
The course covers important issues in supervised learning, unsupervised learning and reinforcement learning. Topics include graphical models and Bayesian inference, hidden Markov model, mixture models and expectation maximization, density estimation, dimensionality reduction, logistic regression and neural network, support vector machines and kernel methods, and bagging and boosting.

CS 669. Introduction to the Internet of Things. 3 Hours.
Definition of the Internet of Things (IoT), history, IoT components, device specifications and examples, architectures, protocols, applications, security and privacy issues, programming and development environments for IoT, interoperability, interfacing IoT devices via web and mobile applications.

CS 670. Computer Graphics. 3 Hours.
Computer graphics is the study of the creation, manipulation, and rendering of shape models and images, for visualization, modeling, shape analysis, and animation. Topics include matrix transforms for motion and viewing, shading, viewing and camera modeling, shape modeling including meshes and smooth parametric curves and surfaces, visibility analysis, sampling, nonphotorealistic rendering, shape analysis, and texture mapping. Topics are explored through code, including OpenGL and GLSL.

CS 671. Shape Design. 3 Hours.
This course covers various aspects of the design of mathematical descriptions of shape. These geometric models are used in computer graphics, game design, automobile and aircraft design, robotics, anatomical modeling, and many other disciplines. Building geometry from images. Bezier and B-spline curves and surfaces.

CS 672. Geometric Modeling for Computer Graphics. 3 Hours.
The formal description of a motion is necessary in computer animation for graphics, game design, robotics, and many other disciplines. This course covers various aspects of the design of motions. Typical topics include position control along Bezier curves, orientation control with quaternion splines, motion planning, motion capture, camera control, collision detection, visibility analysis.

CS 673. Computer Vision and Convolutional Neural Networks. 3 Hours.
Computer vision, the study of the interpretation of images, is central to many areas of computer science, including data science and machine learning, driverless cars, biomedical computing, image computation for social media, and face detection in security. Recent algorithms for vision also leverage deep learning with convolutional neural networks for object recognition. Topics in this course include image smoothing and filtering, edge detection, segmentation, clustering, Hough transform, deformable contours, object recognition, and machine learning for object recognition using large image datasets.

CS 675. Data Visualization. 3 Hours.
The amount and complexity of data produced everyday is increasing at a staggering rate. Visualization presents an intuitive way to explore and interpret data. This course will be an introduction to the principles, and methods for effective visual analysis of data. Techniques to facilitate information visualization for non-spatial data (eg. graphs, text, high-dimensional data) and scientific visualization for spatial data (eg. gridded data from simulations and scanners and sensors) will be covered. Emphasis will be given to interactive approaches, especially while dealing with massive volumes of data. Topics in the domain of data analytics tightly coupled with visualization will also be covered. Students will learn fundamentals of perception, visualization techniques and methods for a broad range of data types, good practices for visualization, and will ultimately be able to develop their own visualization system.

CS 676. Structure from Motion. 3 Hours.
Structure from motion extracts geometric information from a series of images of an object, either still photographs or video streams. The position of the camera may also be computed, yielding camera paths. This topic has powerful applications in many areas, including computer graphics, computer vision, photography, visualization, and video augmentation. Projective geometry, multiple view geometry, feature extraction.

CS 677. Big Data Privacy and Security. 3 Hours.
The course covers topics pertinent to privacy and security of big data applications in practice. Topics include legal and policy aspects, privacy v.s. convenience and usefulness, ethics, compliance with GDPR, CCPA and other regional, national and global privacy regulations; techniques and best practices for security, privacy and compliance including secure and reliable tracking, tagging, audit and monitoring, storage and transmission, integration and governance, sharing, erasure, provenance, risk analysis, and privacy preservation; fairness, accountability, transparency and explainability in machine learning and artificial intelligence.

CS 680. Matrix Algorithms for Data Science. 3 Hours.
Computation with matrices and tensors is at the heart of many areas of computer science, including machine learning, computer vision, computer graphics, and self-driving cars. This course studies matrix computation (solution of linear systems, least squares, spectral analysis, and singular value decomposition) and its applications. These applications will be explored through code.

CS 681. Simulation Models. 3 Hours.
Model development using popular simulation languages, e.g., Excel or OpenOffice.org Calc Spreadsheet; interfacing to an animation system such as Proof Animation or Open_GL.

CS 683. Open Source Security Systems. 3 Hours.
An introduction to the design, implementation, evaluation and maintenance of secure software systems and applications using open source technologies, with an emphasis on hands-on experience. Topics include: open source ecosystems, open source security methodologies and models, notable open source software systems and projects, quality and security assurance through open source, open source supply chain security, major open source cryptographic packages; designing, implementing and maintaining security systems using open source technologies; assessment and regulatory compliance using open source tools, and open source hardware.

CS 684. Robot Motion. 3 Hours.
Path planning algorithms. Configuration space, potential functions, roadmaps, cell decomposition, probabilistic motion planning, compliant motion.

CS 685. Foundations of Data Science. 3 Hours.
Fundamental concepts and techniques in statistical inference and big data analytics. Topics include high-dimensional space, singular value decomposition, random graphs, random walks and Markov chains, data streaming and sketching, and basics of data mining and machine learning.

CS 686. Software-Defined Networking. 3 Hours.
Software defined networking (SDN) allows a logically centralized software component to manage and control the behavior of an entire network. Topics to be covered include abstractions and layered architecture of SDN, data, control and management planes, network virtualization, programming SDN, network functions (e.g. routing, load balancing and security), comparison of OpenFlow and proprietary SDN technologies, and network optimization with SDN.

CS 687. Complex Networks. 3 Hours.
Introduction to complex network theory and real-world applications in biology, physics, sociology, national security and cyber enabled technology systems such as social networks. Essential network models including small world networks, scale free networks, spatial and hierarchical networks together with methods to generate them with a computer will be discussed. In addition, various techniques for the analysis of networks including network modeling and evolution, community structure, dynamic network analysis, and network visualization will be explored.

CS 689. Cyber Risk Management. 3 Hours.
This course develops knowledge and skills in risk based information security management geared toward preventive management and assurance of security of information and information systems in technology-enabled environments. It focuses on risk assessments, risk mitigation strategies, risk profiling and sensitivity, quantitative and qualitative models of calculating risk exposures, security controls and services, threat and vulnerability management, financing the cost of security risks, and return on investment for information security initiatives. The course presents several risk assessment models with an ultimate goal of identifying and realizing the unique and acceptable level of information risk for an organization.

CS 690. Special Topics. 1-3 Hour.
Selected topics in Computer Science.

CS 691. Special Topics. 1-3 Hour.
Selected topics in Computer Science.

CS 692. Digital Image Processing. 1-3 Hour.
Selected topics in Computer Science.

CS 695. Digital Image Processing. 3 Hours.
Human visual system, image acquisition, binary image processing, image transformation, Fourier Transform, segmentation, edge detection, medical imaging modalities, image reconstruction from projections, 3D modelling algorithms, and imaging artifacts.

CS 697. Directed Readings. 1-6 Hour.
Selected readings, research and project development under direction of a faculty member. Must have permission of instructor and graduate program director.

CS 698. Master's Plan II. 1-9 Hour.
Masters student registration.

CS 699. Master's Thesis Research. 1-6 Hour.
Research for M.S. candidates writing a thesis.
Prerequisites: GAC M

CS 700. Formal Semantics of Programming Languages. 2,3 Hours.
Context-sensitive and semantic aspects of programming languages, denotational semantics, mathematical foundations.

CS 701. Program Verification. 3 Hours.
Proving properties of programs, termination and correctness, computability and decidability, role of formal methods in software design.

CS 702. Compiler Design. 3 Hours.
Lexical and syntactical scan, semantics, code generation and optimization, dataflow analysis, parallelizing compilers, automatic compiler generation, and other advanced topics.

CS 710. Database Systems. 3 Hours.
This course offers an introduction to the advanced topics of database management systems. The following topics are addressed: System and file structure, efficient data manipulation using indexing and hashing, query processing, crash recovery, concurrency control, transaction processing, database security and integrity, distributed databases.

CS 713. Emerging Database Technologies. 3 Hours.
This course explores new technological and theoretical foundations for storing and organizing data for "Big Data" applications. Topics include emerging database technologies for high-velocity transaction processing, stream processing, real time analytics, and high-volume data processing. The discussions will focus on several real-world application domains, such as Internet advertising, health care, and social network analysis.

CS 714. Distributed Database Systems. 3 Hours.
Concepts of Distributed Database Systems and Architectures, Distributed Database Design, Distributed Query Processing and Optimization, Transaction Management and Concurrency Control, Heterogeneous and Multidatabase Systems.

CS 715. Multimedia Databases. 3 Hours.
This course introduces the principles of multimedia databases including multimedia information processing, modeling, and retrieval. The media to be considered include text, image, audio and video. At the conclusion of this course, the students should understand what multimedia data retrieval is, the principles, which allow the location of relevant information from amongst a large corpus of multimedia data, and the applications of multimedia information retrieval. The students should also have the expertise and competence to design and implement retrieval software for multimedia data.

CS 716. Big Data Programming. 3 Hours.
Introduction to Big Data, Properties of Big Data, platforms, programming models, applications, business analytics programming, big data processing with Python, R, and SAS, MapReduce programming with Hadoop.

CS 717. Database Security. 3 Hours.
Database fundamentals, introduction to database security, overview of security models, access control models, covert channels and inference channels, MySQL security, Oracle security, Oracle label security, developing a database security plan, SQL server security, security of statistical databases, security and privacy issues of data mining, database applications security, SQL injection, defensive programming, database intrusion prevention, audit, fault tolerance and recovery, Hippocratic databases, XML security, network security, biometrics, cloud database security, big database security.

CS 720. Software Design and Integration. 3 Hours.
This course provides hands-on experience in the design and integration of software systems. Component-based technology, model-driven technology, service-oriented technology, and cloud technology are all explored. Software design basics, including the decomposition of systems into recognizable patterns, the role of patterns in designing software and design refactoring, and attributes of good design. Agile culture, CASE tools, tools for continuous integration, build, testing, and version control.

CS 722. Reflective and Adaptive Systems. 3 Hours.
This course examines the principles of compile-time and run-time adaptation in several contexts, including: reflection, metaprogramming, aspect-oriented software development, and metamodeling (applied to model-driven engineering).

CS 723. Network Security. 3 Hours.
Conventional network security (symmetric and public-key cryptography). Message encryption and authentication. Secure communication between computers in a hostile environment, including E-mail (PGP), virtual private networks (IPSec), remote access (SSH), and E-commerce (SSL), firewalls, intrusion detection and prevention, security of IEEE 802.11 wireless networks (WEP, WPA). Mandatory weekly Linux-based lab.

CS 723L. Network Security Laboratory. 0 Hours.
Laboratory to accompany CS 723.

CS 724. Formal Specification of Software Systems. 3 Hours.
Formal methods for software requirements specification, including VDM, Z, and object-oriented extensions; the relationship among formal requirements, design, and implementation.

CS 725. Metrics and Performance. 3 Hours.
Theory and practice of metrics for performance and scalability of software systems. The course will introduce students to the principles of queuing theory and statistical analysis relevant to analyzing the performance of software products. Students will use profiling frameworks to identify a range of performance problems in existing software. The course will enable students to improve the design of software and eliminate many common design oversights that hamper a system's performance and scalability.

CS 726. Secure Software Development. 3 Hours.
Why and how software fails, characteristics of secure and resilient software, life cycle of secure software development, metrics and models for secure software maturity, design methodology, best practices for secure programming, secure software for mobile computing, cloud computing and embedded systems, methodology for testing and validation.

CS 729. GPU Programming. 3 Hours.
GPU architecture, GPU programming models, GPU parallel algorithms, GPU communication models, GPU performance optimizations, GPU debugging, GPU libraries, multi-GPU program design, and applications of GPU computing.

CS 729L. GPU Programming Lab. 0 Hours.
Laboratory to accompany CS729 GPU Programming.

CS 730. Computer Architecture. 3 Hours.
Introduction to computer architecture, including memory subsystems, direct-mapped and set-associative cache and multi-level cache subsystems, direct-access devices including RAID and SCSI disk drives, processor pipelining including super-scalar and vector machines, parallel architectures including SMP, NUMA and distributed memory systems, Interrupt mechanisms, and future microprocessor design issues.

CS 731. Distributed Systems. 3 Hours.
Object-oriented distributed systems design, distributed software architecture, data and resource access, communication, client-server computing, web technologies, enterprise technologies.

CS 732. Parallel Computing. 3 Hours.
Overview of parallel computing hardware, architectures, & programming paradigms; parallel programming using MPI, Ptureads, and OpenMP; design, development, and analysis of parallel algorithms for matrix computations, FFTs, and Sorting.

CS 733. Cloud Computing. 3 Hours.
Introduction to cloud computing architectures and programming paradigms. Theoretical and practical aspects of cloud programming and problem-solving involving compute, storage and network virtualization. Design, development, analysis, and evaluation of solutions in cloud computing space including machine and container virtualization technologies.

CS 733L. Cloud Computing Lab. 0 Hours.
Laboratory to accompany CS733.

CS 734. Virtualization. 3 Hours.
Theory and practice of virtualization. Origins, history, technical and economic motivations. Relationship to network operating systems and operating system architecture. Simulation, Emulation, Virtualization of CPUs, networks, storage, desktops, memory, devices, and combinations thereof. Different approaches to virtualization, including hardware assists and software-only techniques. Techniques, approaches, and methodologies for scale-out and scale-up computing, including security, performance and economic concerns.

CS 735. Network Programming. 3 Hours.
Remote procedure call and client-server mechanisms. Protocol definition and compilation; client and server stubs and application code; transport independence; multiple client and server systems. Applications, e.g., remote database query and update and image filtering and archiving; systems programming and file systems contexts.

CS 736. Computer Security. 3 Hours.
Study of the breadth of major computer security topics including cyber threats, malware, information assurance, authorization, applied cryptography, web security, mobile and wireless security, network security, systems/software security, database and storage security, user-centered security, and best security practices and countermeasures.

CS 740. Foundations in Bioinformatics. 3 Hours.
Foundations in bioinformatics, emphasizing the application of computational tools and methodology in genomics, analysis of protein functions and structures, and DNA sequencing. Students learn how to use a high level programming language such as Python together with software tools such as BLAST and ArrayTrack to solve bioinformatics problems.

CS 741. Algorithms in Bioinformatics. 3 Hours.
This course covers the design and analysis of algorithmic techniques applied in bioinformatics. Topics include sequence comparison, alignment and matching, suffix tree, sequence database search, phylogenetic tree, genome rearrangement, motif finding, RNA prediction, and peptide sequencing.

CS 742. Mobile and Wireless Security. 3 Hours.
Mobile/wireless devices are ubiquitous, raising the potential for many cyber threats. This course examines security vulnerabilities inherent in many existing and emerging mobile and wireless systems, ranging from smartphones to wearables and RFID tags. In addition to exposing security vulnerabilities, defensive mechanisms to address these vulnerabilities drawn from existing deployments and research literature will be studied.

CS 743. Cloud Security. 3 Hours.
Definition of cloud computing, cloud computing models, privacy, authenticity and integrity of outsourced data, proof of data possession / retrievability, cloud forensics, malware analysis as a service, remote verification of capability and reliability, proof of availability, economic attacks on clouds and outsourced computing, virtual machine security, trusted computing technology and clouds, verifiable resource accounting, cloud-centric regulatory compliance issues and mechanisms, business and security risk models, secure MapReduce, applications of secure cloud computing, private information retrieval and cloud cartography.

CS 745. Modern Cryptography. 3 Hours.
Theory and practices of modern cryptographic techniques, algorithms and protocols, including formal analysis. Secret key encryption algorithms, public key encryption algorithms, stream ciphers, one-way hashing algorithms, authentication and identification, digital signatures, signcryption, key establishment and management, secret sharing and data recovery, zero-knowledge proofs, public key infrastructures, efficient implementation, cryptanalytic attacks and countermeasures, security models, assumptions and proofs.

CS 746. Blockchain and Cryptocurrency. 3 Hours.
Fundamental principles of digital cash systems including Bitcoin, Ripple and other notable cryptocurrencies. Topics to be covered include how a cryptocurrency works, blockchain and other decentralized consensus protocols, proof of work, proof of stake, security and privacy of cryptocurrencies, cryptographic techniques for digital currency, and applications of blockchain in peer-to-peer trust establishment, smart contracts, digital asset management, financial exchanges and distributed autonomous organization.

CS 747. Biomedical Modeling. 3 Hours.
Modeling from biomedical datasets. Acquisition, segmentation; registration and fusion; construction of shape models; measurement; illustration modeling techniques for surgical planning.

CS 750. Theory of Computation. 3 Hours.
Topics include Turing machines, computability, computational complexity, complexity classes, P vs. NP, circuit complexity, randomized computation, interactive proofs, quantum, decidability, primality testing, and other computational models.

CS 751. Formal Language Theory. 3 Hours.
Parsing and translation theory, formal syntax, proof properties and complexity measures.

CS 752. Advanced Algorithms and Applications. 3 Hours.
The design and analysis of fundamental algorithms that underpin all fields of importance ranging from data science, business intelligence, finance and cyber security to bioinformatics. Algorithms to be covered include dynamic programming, greedy technique, linear programming, network flow,sequence matching, search and alignment, randomized algorithms, page ranking, data compression, and quantum algorithms. Efficiency of algorithms is analyzed in both memory and time costs.

CS 753. Computational Geometry. 3 Hours.
Basic methods and data structures, geometric searching, convex hulls, proximity, intersections.

CS 755. Quantum Computing. 3 Hours.
Quantum mechanics, mathematical foundations, quantum gates, quantum circuits, quantum computer, quantum programming, quantum algorithms, quantum computing methods, and applications of quantum computing.

CS 756. Web Security. 3 Hours.
The web uses advanced applications that run on a large variety of browsers that may be built using programming languages such as JavaScript, AJAX, Google Web Toolkit and Apache Struts, to name a few. This course studies how core web technologies work, the common security vulnerabilities associated with them, and how to build secure web applications that are free from these vulnerabilities.

CS 757. Penetration Testing and Vulnerability Assessment. 3 Hours.
This course focuses on penetration testing and vulnerability analysis. It introduces methodologies, techniques and tools to analyze and identify vulnerabilities in stand-alone and networked applications. It also covers methodologies for legal and standards compliance.

CS 759. Multiprocessor Programming. 3 Hours.
This course examines synchronization in concurrent systems, available atomic primitives, non-blocking programming techniques, lock-/wait-freedom, transactional memory, and memory models in hardware and software. The application of these techniques to the development of scalable data structures for multi-core architectures will be a central topic of this course.

CS 760. Artificial Intelligence. 3 Hours.
Programming methodologies, logic foundations, natural language applications, expert systems.

CS 762. Natural Language Processing. 3 Hours.
This course provides a broad introduction to Natural Language Processing (Computational Linguistics) and its applications. Topics covered include language modeling with neural networks, sequence labelling algorithms (segmentation, chunking, tokenization, part-of-speech tagging and others), syntactic and dependency parsing, vector-based representation models and using Deep Learning in NLP applications. Some application areas covered include information extraction and named entity recognition, semantic role labelling, word sense disambiguation, text generation, information retrieval, question answering, machine translation and other areas as time permits. There will be a focus on Deep Learning approaches using Tensorflow, PyTorch and keras for a major student project. Jupyter Notebooks will be used for assignments.

CS 763. Data Mining. 3 Hours.
Techniques used in data mining (such as frequent sets and association rules, decision trees, Bayesian networks, classification, clustering), algorithms underlying these techniques, and applications.

CS 765. Deep Learning. 3 Hours.
Deep Learning is a rapidly growing area of machine learning that has revolutionized speech recognition, image recognition and natural language processing. This course teaches deep learning basics such as logistic regression, stochastic gradient descent, deep neural networks, convolutional neural networks and deep models for text and sequences. Students will also gain hands-on experience of using deep learning systems such as TensorFlow.

CS 767. Machine Learning. 3 Hours.
The course covers important issues in supervised learning, unsupervised learning and reinforcement learning. Topics include graphical models and Bayesian inference, hidden Markov model, mixture models and expectation maximization, density estimation, dimensionality reduction, logistic regression and neural network, support vector machines and kernel methods, and bagging and boosting.

CS 769. Introduction to the Internet of Things. 3 Hours.
Definition of the Internet of Things (IoT), history, IoT components, device specifications and examples, architectures, protocols, applications, security and privacy issues, programming and development environments for IoT, interoperability, interfacing IoT devices via web and mobile applications.

CS 770. Computer Graphics. 3 Hours.
Computer graphics is the study of the creation, manipulation, and rendering of shape models and images, for visualization, modeling, shape analysis, and animation. Topics include matrix transforms for motion and viewing, shading, viewing and camera modeling, shape modeling including meshes and smooth parametric curves and surfaces, visibility analysis, sampling, nonphotorealistic rendering, shape analysis, and texture mapping. Topics are explored through code, including OpenGL and GLSL.

CS 771. Shape Design. 3 Hours.
This course covers various aspects of the design of mathematical descriptions of shape. These geometric models are used in computer graphics, game design, automobile and aircraft design, robotics, anatomical modeling, and many other disciplines. Building geometry from images. Bezier and B-spline curves and surfaces.

CS 772. Geometric Modeling for Computer Graphics. 3 Hours.
The formal description of a motion is necessary in computer animation for graphics, game design, robotics, and many other disciplines. This course covers various aspects of the design of motions. Typical topics include position control along Bezier curves, orientation control with quaternion splines, motion planning, motion capture, camera control, collision detection, visibility analysis.

CS 773. Computer Vision and Convolutional Neural Networks. 3 Hours.
Computer vision, the study of the interpretation of images, is central to many areas of computer science, including data science and machine learning, driverless cars, biomedical computing, image computation for social media, and face detection in security. Recent algorithms for vision also leverage deep learning with convolutional neural networks for object recognition. Topics in this course include image smoothing and filtering, edge detection, segmentation, clustering, Hough transform, deformable contours, object recognition, and machine learning for object recognition using large image datasets.

CS 775. Data Visualization. 3 Hours.
The amount and complexity of data produced everyday is increasing at a staggering rate. Visualization presents an intuitive way to explore and interpret data. This course will be an introduction to the principles, and methods for effective visual analysis of data. Techniques to facilitate information visualization for non-spatial data (eg. graphs, text, high-dimensional data) and scientific visualization for spatial data (eg. gridded data from simulations and scanners and sensors) will be covered. Emphasis will be given to interactive approaches, especially while dealing with massive volumes of data. Topics in the domain of data analytics tightly coupled with visualization will also be covered. Students will learn fundamentals of perception, visualization techniques and methods for a broad range of data types, good practices for visualization, and will ultimately be able to develop their own visualization system.

CS 776. Structure from Motion. 3 Hours.
Structure from motion extracts geometric information from a series of images of an object, either still photographs or video streams. The position of the camera may also be computed, yielding camera paths. This topic has powerful applications in many areas, including computer graphics, computer vision, photography, visualization, and video augmentation. Projective geometry, multiple view geometry, feature extraction.

CS 777. Big Data Privacy and Security. 3 Hours.
The course covers topics pertinent to privacy and security of big data applications in practice. Topics include legal and policy aspects, privacy v.s. convenience and usefulness, ethics, compliance with GDPR, CCPA and other regional, national and global privacy regulations; techniques and best practices for security, privacy and compliance including secure and reliable tracking, tagging, audit and monitoring, storage and transmission, integration and governance, sharing, erasure, provenance, risk analysis, and privacy preservation; fairness, accountability, transparency and explainability in machine learning and artificial intelligence.

CS 780. Matrix Algorithms for Data Science. 3 Hours.
Computation with matrices and tensors is at the heart of many areas of computer science, including machine learning, computer vision, computer graphics, and self-driving cars. This course studies matrix computation (solution of linear systems, least squares, spectral analysis, and singular value decomposition) and its applications. These applications will be explored through code.

CS 781. Simulation Models and Animations. 3 Hours.
Model development using popular simulation languages, e.g., Excel or OpenOffice.org Calc Spreadsheet; interfacing to an animation system such as Proof Animation or Open_GL.

CS 783. Open Source Security Systems. 3 Hours.
An introduction to the design, implementation, evaluation and maintenance of secure software systems and applications using open source technologies, with an emphasis on hands-on experience. Topics include: open source ecosystems, open source security methodologies and models, notable open source software systems and projects, quality and security assurance through open source, open source supply chain security, major open source cryptographic packages; designing, implementing and maintaining security systems using open source technologies; assessment and regulatory compliance using open source tools, and open source hardware.

CS 784. Robot Motion. 3 Hours.
Path planning algorithms. Configuration space, potential functions, roadmaps, cell decomposition, probabilistic motion planning, compliant motion.

CS 785. Foundations of Data Science. 3 Hours.
Fundamental concepts and techniques in statistical inference and big data analytics. Topics include high-dimensional space, singular value decomposition, random graphs, random walks and Markov chains, data streaming and sketching, and basics of data mining and machine learning.

CS 786. Software-Defined Networking. 3 Hours.
Software defined networking (SDN) allows a logically centralized software component to manage and control the behavior of an entire network. Topics to be covered include abstractions and layered architecture of SDN, data, control and management planes, network virtualization, programming SDN, network functions (e.g. routing, load balancing and security), comparison of OpenFlow and proprietary SDN technologies, and network optimization with SDN.

CS 787. Complex Networks. 3 Hours.
Introduction to complex network theory and real-world applications in biology, physics, sociology, national security and cyber enabled technology systems such as social networks. Essential network models including small world networks, scale free networks, spatial and hierarchical networks together with methods to generate them with a computer will be discussed. In addition, various techniques for the analysis of networks including network modeling and evolution, community structure, dynamic network analysis, and network visualization will be explored.

CS 790. Special Topics. 3 Hours.
Selected Topics in Computer Science.

CS 791. Special Topics. 3 Hours.
Selected Topics in Computer Science.

CS 792. Special Topics. 3 Hours.
Selected Topics in Computer Science.

CS 795. Digital Image Processing. 3 Hours.
Human visual system, image acquisition, binary image processing, image transformation, Fourier Transform, segmentation, edge detection, medical imaging modalities, image reconstruction from projections, 3D modelling algorithms, and imaging artifacts.

CS 796. Directed Readings and Research. 1-9 Hour.
Selected readings, research and project development under direction of a faculty member. Must have permission of instructor and graduate program director.

CS 799. Dissertation Research. 1-9 Hour.
Prerequisite: Admission to candidacy.
Prerequisites: GAC Z

J. Frank Barefield, Jr. Department of Criminal Justice

Chair: Dr. Kent R. Kerley, krkerley@uab.edu

Graduate Director: Dr. Tara D. Warner, twarner2@uab.edu

The J. Frank Barefield, Jr. Department of Criminal Justice is home to multiple graduate programs, including programs of study leading to the Master of Science in Criminal Justice (p. 100) (MSCJ), the Master of Science in Forensic Science (p. 103) (MSFS), the Master of Science in Cyber Security (p. 52) (jointly with the Department of Computer Science) and graduate certificates in Computer Forensics. The department also co-sponsors a joint MSCJ/MPA program with the Department of Political Science and Public Administration.

The certificate in Computer Forensics is designed for people who want to have experience in computer forensics, but not at the level of a degree program. It can be an add on to a current graduate program (for example, criminal justice for those who want to be a forensic examiner for a law enforcement agency, forensic science to expand skills, or for other degrees where computer forensics could be helpful). It can also be helpful to professionals working in cybersecurity, forensics, and other fields who would like to have additional training in computer forensics. NOTE: This is not an online program. Some courses may be taken on line; but most have hands on requirements that necessitate classroom attendance.

Application Deadlines

- **Fall semester:** July 1 for completed application
- **Spring semester:** November 1 deadline for completed application

Application Information

Students are accepted into the program during the Fall or Spring of each year. Students are strongly encouraged to submit their completed application materials to the Graduate School no later than July 1 for Fall admission and November 1 for Spring admission. A completed application includes the following:

- application for admission
- payment of application fee
- transcripts from all post-secondary institutions the student attended
- three letters of recommendation
- a personal statement

All applications for admission to the Certificate Program are made through the UAB Graduate School and not to the Department. Application for admission can be made online through the UAB Graduate School website or by calling (205) 934-8227.

The Graduate School requires an official transcript from every institution attended. The mailing address to send official transcripts is:

UAB Graduate School
LHL G03
1720 2nd Avenue South
Birmingham, AL 35294-0013

Application Fees

Application fees are $50 for domestic students and $60 for international students.

Admission Requirements

Applicants must supply transcripts showing completion of a bachelor's degree from a regionally accredited college or university in the United States

International Students

International students have additional requirements and are strongly urged to consult the UAB Graduate School before seeking admission to the Computer Forensics certificate program. TOEFL and TWE are required for international applicants whose native language is not English. Minimum scores:

- TOEFL: 80
- IELTS: 6.5
- PTEA: 53

Electronic transfer code for submission of TOEFL scores is 1856.

Read about the Certificate program and course descriptions in the Graduate Catalog.

Computer Forensics Certificate

Requirements		Hours
CJ 501	Foundations of Digital Forensics	3
CJ 502	Computer Forensics	3
CJ 519	Investigating Online Crimes	3
CJ 537	Digital Media Forensics	3
CJ 538	Investigation of Malicious Attacks	3
CJ 554	Financial Crimes and Investigations	3
Total Hours		**18**

CJ-Criminal Justice Courses

CJ 500. Drugs and Society. 3 Hours.
This course teaches students the pharmacological effects and different categories of drugs. Different theories of drug use are discussed as well as the historical development of drug laws including different methods of regulating drug use. Various harms associated with drug use are discussed as well as the consequences of drug prohibition.

CJ 501. Foundations of Digital Forensics. 3 Hours.
This course provides those who do not have a strong background in digital forensics the foundational information and programs used in countering cybercrime. You will become familiar with common programming languages and tools used in digital forensic investigations. You will also be required to learn an industry-focused writing style.

CJ 502. Computer Forensics. 3 Hours.
Use of analytical and investigative techniques in criminal or civil litigation to identify, collect, examine and preserve evidence/information magnetically stored or encoded.

CJ 503. Restorative Justice. 3 Hours.
Introduction to, and analysis of, movement in criminal justice to institutionalize peaceful approaches to harm, problem-solving and violations of legal and human rights. Includes discussion of specific programs, critical evaluation of these programs, and analysis of future directions of the movement.

CJ 504. Serial Killers. 3 Hours.
Examination of the psychology and sociology of serial killers; case studies and agency responses to these offenders.

CJ 507. Special Topics in Criminal Justice. 3 Hours.
In-depth analysis of substantive topic in criminal justice or criminology including contemporary issues, ethics, historical review, or related topics. Varies by semester and by Instructor. May be repeated twice for credit.

CJ 508. Juvenile Delinquency. 3 Hours.
Introduction to the nature, scope, and causes of illegal behavior by juveniles, and societal responses to that behavior.

CJ 511. Juvenile Justice System. 3 Hours.
Introduction to the evolution and operation of specialized agencies and procedures to address juvenile law-breaking, including emerging problems and solutions.

CJ 512. Juvenile Law. 3 Hours.
Review and analysis of emerging statutory and case law in American juvenile justice.

CJ 519. Investigating Online Crimes. 3 Hours.
Study of cyber investigative techniques, involving focused analysis of email and websites; examination of legal process and preparing evidence in cyber crime cases.

CJ 530. Ethics and Computer Forensics. 3 Hours.
Overview of different systems of ethics; the role of ethics in computer forensics, cybercrime investigation, and information security; examination of ethical issues facing professionals involved in computer forensics, cybercrime investigation, and information security.

CJ 537. Digital Media Forensics. 3 Hours.
Digital media forensics addresses all stored digital evidence types faced by cyber security professionals and computer forensics examiners. Students will learn to analyze character encoding, file formats, and digital media, including hard drives, smartphones and other portable devices, and cloud-hosted evidence, as well as disk acquisition, duplication and evidence preservation techniques and how to apply these techniques in typical criminal investigation scenarios.

CJ 537L. Digital Media Forensics Lab. 0 Hours.
Laboratory to accompany CJ 537.

CJ 538. Investigation of Malicious Attacks. 3 Hours.
An advanced examination of analysis of malicious attacks from a criminal justice perspective. Topics include investigative techniques and practices, static and dynamic analysis, and technique and tools of investigations of malicious attacks. The structure of a malicious attack investigations from the perspectives of both an incident responder and law enforcement investigators targeting a cyber criminal through a series of case studies. Counts toward the MSCJ and Computer Forensic certificate.
Prerequisites: CJ 502 [Min Grade: C]

CJ 540. White Collar and Corporate Crime. 3 Hours.
Introduction to, and analysis of, illegal/deviant behavior occurring in organizational settings, including crimes committed by and against complex organizations.

CJ 542. Race, Crime, and Social Policy. 3 Hours.
Examination of how subordinate status of racial and ethnic minority groups affects interaction with the justice system as offenders, victims, and professionals.

CJ 543. Women and Crime. 3 Hours.
Provides students with a view into the intersection of gender and crime. Explores core topics on experiences of women and girls as victims, offenders, and criminal justice professionals.

CJ 550. Questioned Death Investigation. 3 Hours.
Examination of forensic pathology as used in local medical examiners' offices.

CJ 554. Financial Crimes and Investigations. 3 Hours.
Survey of the field of financial crime and its investigation, including review of various financial crimes (fraud, money laundering, cybercrime, etc.), investigative techniques, resources specific to the investigation of these crimes, and the role of financial institutions in combating these crimes.

CJ 560. Violence: An American Tradition. 3 Hours.
The course examines violence as an American tradition. Although the class examines historical acts of violence as catalysts for social change, the emphasis will be on destructive or negative violence, -- criminal violence. The class examines many different acts of violence in society as well as policies and prevention strategies.

CJ 563. Urban Structures. 3 Hours.
One of the oldest explanations of criminal behavior is that crime is concentrated in particular areas of the city. This class examines the structure of cities, how they grow, and particularly how they decline. It addresses how this decline can produce high levels of crime. It also addresses how cities can be revitalized, and how the justice system can work to reduce crime in these areas.

CJ 564. Crime and Place. 3 Hours.
One of the oldest explanations of criminal behavior is that crime is concentrated in particular areas of the city. But why is that? Is it something about the people, the place, or both? This class will look at the structure of cities, how they grow, and particularly how they decline. We will talk about how this decline can produce high levels of crime. We will also talk about how cities can be revitalized, and how the justice system can work to reduce crime in these areas.

CJ 566. Spatial Analysis. 3 Hours.
This skills-based class will introduce students to the application of geographic information systems (GIS) to crime-related topics and issues.

CJ 583. Patterns in Crime. 3 Hours.
Examination of the major correlates of crime and criminality,including age, race, sex, and socio-economic status, examination of major sources of information from which data on crime correlates are gathered.

CJ 592. Study Away in Criminal Justice. 3 Hours.
Affords students the opportunity engage in academic study outside of the U.S. to examine substantive topics in crime and justice. Students spend time at a destination point, where they engage with students and faculty members in classroom and research settings at partner post-secondary institutions, experience immersion in foreign culture, and engage in comparative analysis of policies and programs relating to crime and justice.

CJ 600. Pro-Seminar in Criminal Justice. 3 Hours.
Critical analysis of formal and informal processing of offenders by criminal justice agencies, including police, courts, and corrections; effectiveness and future directions.

CJ 601. Seminar in Criminological Theory. 3 Hours.
Classic and contemporary theoretical explanations of crime and criminality.

CJ 603. Seminar in Criminal Justice Administration. 3 Hours.
Theories of organizational structure, motivation, and management applied to criminal justice agencies.

CJ 604. Seminar in Criminal Justice Policy. 3 Hours.
Origins, formulation, implementation, and evaluation of criminal justice policy; classic and contemporary examples of policy innovations.

CJ 605. Seminar in Research Design. 3 Hours.
Quantitative methods of empirical research emphasizing criminal justice/criminological applications; current research methodologies relating to analysis of issues involving crime and criminal justice.

CJ 606. Seminar in Data Analysis. 3 Hours.
Bivariate and multivariate analyses and intepretation of results from substantive research.

CJ 675. Law Evidence and Procedure. 3 Hours.
Overview and examination of the legal aspects of physical evidence, including rules of evidence, procedural rules, and the role of expert witnesses.

CJ 688. Special Topics in Criminal Justice. 3 Hours.
Special Topics in Criminal Justice.

CJ 693. Graduate Practitioner Internship in Criminal Justice. 3 Hours.
Internship specifically arranged for pracitioners internship credit for the criminal justice major.

CJ 695. Graduate Independent Study (Non-Thesis). 3 Hours.
Independent study in a substantive area of interest under the direction of a faculty member.

CJ 696. Graduate Internship in Criminal Justice. 3 Hours.
Field experience in criminal justice agency setting. May be repeated for a maximum of 6 hours credit.

CJ 697. Graduate Plan II Research Project. 3 Hours.
Optional independent study in a student's substantive area of interest under the direction of a faculty member.

CJ 698. Directed Research (Non-Thesis). 3 Hours.
Independent study in a student's substantive area of interest under the direction of a faculty member.

CJ 699. Thesis Research. 1-6 Hour.
Admission to candidacy and successful defense of thesis proposal.
Prerequisites: GAC M

FS-Forensic Science Courses

FS 550. Instrumental Analysis. 3 Hours.
This course concerns the theory and practice of instrumental methods for the separation, identification and quantitative analysis of chemical substances. Upon completion of this course, students will have a working knowledge of analytical instrumentation typically employed in chemical/biochemical research and industry laboratories.

FS 565. Cold Case Analysis. 3 Hours.
Introduction to the methods used in analyzing unsolved cases, including innovative uses of technology, 3rd party investigators, and teams.

FS 567. Forensic Toxicology. 3 Hours.
Discussion of drugs and poisons found in biological evidence, including the pharmacokinetic and pharmacodynamic properties of drugs and poisons, evidence collection and handling, selection of the most appropriate evidence, and analytical methods of detection.

FS 572. Molecular Genetics for Forensic Scientists. 3 Hours.
Gene structure, function, and regulation. Chromosome structure and inheritance. An overview of the human genome.

FS 650. Advanced Questioned-Death Investigation. 3 Hours.
Examination of forensic pathology as used in local medical examiners' offices.

FS 653. Advanced Investigation of Fires and Explosions. 3 Hours.
Introduction to arson investigation including overview of specific techniques used in case investigation.

FS 670. Elements of Forensic Science. 3 Hours.
Introduction to philosophical considerations and historic landmarks in the discipline; overview of major sub-disciplines in forensic science; examination of the ethics and expert witnesses and their role in forensic science.

FS 671. Conventional Criminalistics. 3 Hours.
Exploration of basic methodologies and approaches for identifying, collecting, and analyzing trace and pattern evidence, including an overview of microscopy.

FS 672. Advanced Conventional Criminalistics. 3 Hours.
Examination of advanced methods for the analysis of trace and pattern evidence.
Prerequisites: FS 671 [Min Grade: C]

FS 673. Forensic Drug Analysis. 3 Hours.
Exploration of the isolation, identification, and quantification of commonly abused drugs and common poisons; interpretation of findings and correlation with legal applications.

FS 674. Molecular Biology in Forensic Science. 3 Hours.
DNA replication, transcription, and translation. Polymerase chain reaction (PCR) techniques used to amplify human DNA for identification of biological evidence. Methods for identifying and collecting blood and semen stains. DNA extraction. Short tandem repeat typing using capillary electrophoresis.
Prerequisites: FS 572 [Min Grade: C]

FS 676. Advanced Biological Methods in Forensic Science. 3 Hours.
Discussion of current issues and trends in forensic DNA analysis, including advanced analysis of biological evidence samples.
Prerequisites: FS 674 [Min Grade: C]

FS 677. Advanced Drug Chem. & Toxicology. 3 Hours.
Discussion of relevant analyses conducted for drugs and poisons occurring in biological evidence; examination of the pharmacokinetic and pharmacodynamic properties of detected substances.
Prerequisites: FS 567 [Min Grade: C]

FS 679. Seminar in Forensic Science. 3 Hours.
Review of forensic science in the literature. Review, discussion, and presentation of forensic science student research.

FS 680. Graduate Internship in Forensic Science. 1-3 Hour.
Field experience in a forensic science laboratory.
Prerequisites: FS 698 [Min Grade: C] or FS 699 [Min Grade: C]

FS 686. Special Topics in Forensic Science. 3 Hours.
In-depth review of 3-4 topics in forensic science presented by practitioners in the field.

FS 698. Directed Research in Forensic Science (Non-Thesis). 1-6 Hour.
Independent study in a student's substantive area of interest under the direction of a faculty member.
Prerequisites: FS 679 [Min Grade: C]

FS 699. Thesis Research in Forensic Science. 1-6 Hour.
Independent study in a student's substantive area of interest under the direction of a faculty member. Admission to candidacy and successful defense of thesis proposal.
Prerequisites: GAC M

FS 703. Laboratory Rotation III: Drug Analysis. 3 Hours.
Lab Rotation III Drug Analysis.

FS 704. Laboratory Rotation II: Biological Methods. 3 Hours.
Lab Rotation II Biol Methods.

Criminal Justice

Degree Offered:	M.S.C.J.
Director:	Tara D. Warner, Ph.D.
Phone:	(205) 934-2069
E-mail:	twarner2@uab.edu
Website:	http://www.uab.edu/cas/criminaljustice/

To obtain specific admissions requirements on how to apply to Graduate School, prospective students should visit this page: http://www.uab.edu/cas/criminaljustice/graduate/mscj

Program Information

The criminal justice graduate program requires study in the overall discipline, with intensive focus on the areas of criminal justice policy, criminal justice administration, research methods and statistics, and criminological theory. Beyond a core set of required courses, the program features a **Thesis Track** (Plan I) designed for students interested in pursuing a doctorate in criminal justice or criminology, and a **Non-Thesis Track** (Plan II) designed for students interested in pursuing entry- or advanced-level positions in a criminal justice or related agency setting.
Students selecting the Plan I option are **required** to complete a thesis project under the supervision of a faculty committee.

Each year, students are admitted to the MSCJ program for the fall and spring terms. **The application deadline for receipt of Fall admission materials by the Graduate School is July 1**. **The application deadline for receipt of Spring admission materials by the Graduate School is November 1**. Students may admitted to the MSCJ program "in good standing" provided they meet all minimum admission criteria established by the Graduate School and the program, which include having taken an introductory-level statistics course and an introductory-level research methods course in which a grade of "B" or better was earned.
Most students admitted to the program have earned a cumulative undergraduate grade point of average (GPA) of 3.0 or higher. Students who otherwise meet minimum admission criteria but who have not taken both the statistics and the research methods courses **may** be admitted to the MSCJ program on a "contingency" basis. Students so admitted will **not** be allowed to register for graduate coursework until the contingencies are removed. Students meeting the minimum requirements for admission including taking the statistics and research methods courses but who lack a substantive background in criminal justice **may** be admitted to the MSCJ program on a "contingency" basis, but will be required to take remedial coursework before they will be allowed to register for any graduate courses.

MSCJ Online

Students who wish to take courses online may complete all or part of the MSCJ completely on line. There is no "online degree," it is the same degree regardless of how the courses are taken. Students may take some courses in class and some online, or may complete the MSCJ completely online.

The Online MSCJ Degree is designed to mirror the in-class Plan II degree. Students enrolled in the online degree are required to take the same courses as the Plan II degree — but the courses may be taken 100% online. The degree is structured so that students can graduate in 4 semesters (fall, spring, summer, fall) by taking 9 hours each semester.

Under special circumstances, and with permission from the Program Director, students may be allowed to complete a thesis through the online MSCJ program.

Financial Aid

Students who are admitted to the M.S.C.J. program "in good standing" are eligible to receive department-based financial aid in the form of graduate assistantships or scholarships that are awarded on a

competitive basis. Students are typically notified of such awards in early June of each year for the following fall.

Additional Information

Deadline for Entry Term(s):	Fall and Spring
Deadline for All Application Materials to be in the Graduate School Office:	July 1 for Fall and November 1 for Spring
Number of Evaluation Forms Required:	Three
Entrance Tests	TOEFL and TWE required for international applicants whose native language is not English.)

Contact Information

For more information, contact Dr. Tara D. Warner, Department of Criminal Justice, University of Alabama at Birmingham, 1201 University Boulevard Office Building, Suite 210, Birmingham, Alabama 35294-4562.
Telephone: 205-934-2069
E-mail: twarner2@uab.edu
Website: http://www.uab.edu/cas/criminaljustice/

Master of Science in Criminal Justice

Plan 1 - Thesis - 30 hours [1]

Requirements		Hours
CJ 583	Patterns in Crime	3
CJ 600	Pro-Seminar in Criminal Justice	3
CJ 601	Seminar in Criminological Theory	3
CJ 604	Seminar in Criminal Justice Policy	3
CJ 605	Seminar in Research Design	3
CJ 606	Seminar in Data Analysis	3
Thesis Research [2]		6
CJ 699	Thesis Research	
CJ Electives [3]		6
Total Hours		**30**

1 Students can take up to 6 hours of independent study (CJ 695) and/or up to 9 hours of directed non-thesis research (CJ 698)
2 Minimum of 6 hours of CJ 699 required.
3 CJ 500+ level courses or substitute approved by a graduate program director

Plan II - Non-Thesis - 33 hours

Requirements		Hours
CJ 583	Patterns in Crime	3
CJ 600	Pro-Seminar in Criminal Justice	3
CJ 601	Seminar in Criminological Theory	3
CJ 603	Seminar in Criminal Justice Administration	3
CJ 604	Seminar in Criminal Justice Policy	3
CJ 605	Seminar in Research Design	3
CJ 606	Seminar in Data Analysis	3
Electives (CJ 500+ level courses) [1]		**12**
Total Hours		**33**

1 CJ 500+ level courses or substitute approved by a graduate program director

Requirements for a Dual Degree - Master of Science in Criminal Justice and Master of Public Administration

Requirements		Hours
CJ 583	Patterns in Crime	3
CJ 600	Pro-Seminar in Criminal Justice	3
CJ 601	Seminar in Criminological Theory	3
CJ 604	Seminar in Criminal Justice Policy	3
CJ 605	Seminar in Research Design	3
CJ 606	Seminar in Data Analysis	3
Electives [2]		12
Total Hours		**30**

1 Other courses at 500 level or above may apply with CJ Grad Director approval, except courses in MPA that are required for the MPA.
2 500 level or above.

Courses

CJ 500. Drugs and Society. 3 Hours.
This course teaches students the pharmacological effects and different categories of drugs. Different theories of drug use are discussed as well as the historical development of drug laws including different methods of regulating drug use. Various harms associated with drug use are discussed as well as the consequences of drug prohibition.

CJ 501. Foundations of Digital Forensics. 3 Hours.
This course provides those who do not have a strong background in digital forensics the foundational information and programs used in countering cybercrime. You will become familiar with common programming languages and tools used in digital forensic investigations. You will also be required to learn an industry-focused writing style.

CJ 502. Computer Forensics. 3 Hours.
Use of analytical and investigative techniques in criminal or civil litigation to identify, collect, examine and preserve evidence/information magnetically stored or encoded.

CJ 503. Restorative Justice. 3 Hours.
Introduction to, and analysis of, movement in criminal justice to institutionalize peaceful approaches to harm, problem-solving and violations of legal and human rights. Includes discussion of specific programs, critical evaluation of these programs, and analysis of future directions of the movement.

CJ 504. Serial Killers. 3 Hours.
Examination of the psychology and sociology of serial killers; case studies and agency responses to these offenders.

CJ 507. Special Topics in Criminal Justice. 3 Hours.
In-depth analysis of substantive topic in criminal justice or criminology including contemporary issues, ethics, historical review, or related topics. Varies by semester and by Instructor. May be repeated twice for credit.

CJ 508. Juvenile Delinquency. 3 Hours.
Introduction to the nature, scope, and causes of illegal behavior by juveniles, and societal responses to that behavior.

CJ 511. Juvenile Justice System. 3 Hours.
Introduction to the evolution and operation of specialized agencies and procedures to address juvenile law-breaking, including emerging problems and solutions.

CJ 512. Juvenile Law. 3 Hours.
Review and analysis of emerging statutory and case law in American juvenile justice.

CJ 519. Investigating Online Crimes. 3 Hours.
Study of cyber investigative techniques, involving focused analysis of email and websites; examination of legal process and preparing evidence in cyber crime cases.

CJ 530. Ethics and Computer Forensics. 3 Hours.
Overview of different systems of ethics; the role of ethics in computer forensics, cybercrime investigation, and information security; examination of ethical issues facing professionals involved in computer forensics, cybercrime investigation, and information security.

CJ 537. Digital Media Forensics. 3 Hours.
Digital media forensics addresses all stored digital evidence types faced by cyber security professionals and computer forensics examiners. Students will learn to analyze character encoding, file formats, and digital media, including hard drives, smartphones and other portable devices, and cloud-hosted evidence, as well as disk acquisition, duplication and evidence preservation techniques and how to apply these techniques in typical criminal investigation scenarios.

CJ 537L. Digital Media Forensics Lab. 0 Hours.
Laboratory to accompany CJ 537.

CJ 538. Investigation of Malicious Attacks. 3 Hours.
An advanced examination of analysis of malicious attacks from a criminal justice perspective. Topics include investigative techniques and practices, static and dynamic analysis, and technique and tools of investigations of malicious attacks. The structure of a malicious attack investigations from the perspectives of both an incident responder and law enforcement investigators targeting a cyber criminal through a series of case studies. Counts toward the MSCJ and Computer Forensic certificate.
Prerequisites: CJ 502 [Min Grade: C]

CJ 540. White Collar and Corporate Crime. 3 Hours.
Introduction to, and analysis of, illegal/deviant behavior occurring in organizational settings, including crimes committed by and against complex organizations.

CJ 542. Race, Crime, and Social Policy. 3 Hours.
Examination of how subordinate status of racial and ethnic minority groups affects interaction with the justice system as offenders, victims, and professionals.

CJ 543. Women and Crime. 3 Hours.
Provides students with a view into the intersection of gender and crime. Explores core topics on experiences of women and girls as victims, offenders, and criminal justice professionals.

CJ 550. Questioned Death Investigation. 3 Hours.
Examination of forensic pathology as used in local medical examiners' offices.

CJ 554. Financial Crimes and Investigations. 3 Hours.
Survey of the field of financial crime and its investigation, including review of various financial crimes (fraud, money laundering, cybercrime, etc.), investigative techniques, resources specific to the investigation of these crimes, and the role of financial institutions in combating these crimes.

CJ 560. Violence: An American Tradition. 3 Hours.
The course examines violence as an American tradition. Although the class examines historical acts of violence as catalysts for social change, the emphasis will be on destructive or negative violence, -- criminal violence. The class examines many different acts of violence in society as well as policies and prevention strategies.

CJ 563. Urban Structures. 3 Hours.
One of the oldest explanations of criminal behavior is that crime is concentrated in particular areas of the city. This class examines the structure of cities, how they grow, and particularly how they decline. It addresses how this decline can produce high levels of crime. It also addresses how cities can be revitalized, and how the justice system can work to reduce crime in these areas.

CJ 564. Crime and Place. 3 Hours.
One of the oldest explanations of criminal behavior is that crime is concentrated in particular areas of the city. But why is that? Is it something about the people, the place, or both? This class will look at the structure of cities, how they grow, and particularly how they decline. We will talk about how this decline can produce high levels of crime. We will also talk about how cities can be revitalized, and how the justice system can work to reduce crime in these areas.

CJ 566. Spatial Analysis. 3 Hours.
This skills-based class will introduce students to the application of geographic information systems (GIS) to crime-related topics and issues.

CJ 583. Patterns in Crime. 3 Hours.
Examination of the major correlates of crime and criminality,including age, race, sex, and socio-economic status, examination of major sources of information from which data on crime correlates are gathered.

CJ 592. Study Away in Criminal Justice. 3 Hours.
Affords students the opportunity engage in academic study outside of the U.S. to examine substantive topics in crime and justice. Students spend time at a destination point, where they engage with students and faculty members in classroom and research settings at partner post-secondary institutions, experience immersion in foreign culture, and engage in comparative analysis of policies and programs relating to crime and justice.

CJ 600. Pro-Seminar in Criminal Justice. 3 Hours.
Critical analysis of formal and informal processing of offenders by criminal justice agencies, including police, courts, and corrections; effectiveness and future directions.

CJ 601. Seminar in Criminological Theory. 3 Hours.
Classic and contemporary theoretical explanations of crime and criminality.

CJ 603. Seminar in Criminal Justice Administration. 3 Hours.
Theories of organizational structure, motivation, and management applied to criminal justice agencies.

CJ 604. Seminar in Criminal Justice Policy. 3 Hours.
Origins, formulation, implementation, and evaluation of criminal justice policy; classic and contemporary examples of policy innovations.

CJ 605. Seminar in Research Design. 3 Hours.
Quantitative methods of empirical research emphasizing criminal justice/ criminological applications; current research methodologies relating to analysis of issues involving crime and criminal justice.

CJ 606. Seminar in Data Analysis. 3 Hours.
Bivariate and multivariate analyses and intepretation of results from substantive research.

CJ 675. Law Evidence and Procedure. 3 Hours.
Overview and examination of the legal aspects of physical evidence, including rules of evidence, procedural rules, and the role of expert witnesses.

CJ 688. Special Topics in Criminal Justice. 3 Hours.
Special Topics in Criminal Justice.

CJ 693. Graduate Practitioner Internship in Criminal Justice. 3 Hours.
Internship specifically arranged for pracitioners internship credit for the criminal justice major.

CJ 695. Graduate Independent Study (Non-Thesis). 3 Hours.
Independent study in a substantive area of interest under the direction of a faculty member.

CJ 696. Graduate Internship in Criminal Justice. 3 Hours.
Field experience in criminal justice agency setting. May be repeated for a maximum of 6 hours credit.

CJ 697. Graduate Plan II Research Project. 3 Hours.
Optional independent study in a student's substantive area of interest under the direction of a faculty member.

CJ 698. Directed Research (Non-Thesis). 3 Hours.
Independent study in a student's substantive area of interest under the direction of a faculty member.

CJ 699. Thesis Research. 1-6 Hour.
Admission to candidacy and successful defense of thesis proposal.
Prerequisites: GAC M

Forensic Science

Degree Offered	M.S.F.S.
Director	Elizabeth Gardner, Ph.D.
Phone	(205) 934-2069
E-mail	eagard@uab.edu
Website	http://www.uab.edu/cas/justice-sciences/graduate-programs/master-of-science-in-forensic-science-msfs

To obtain specific admissions requirements on how to apply to Graduate School, prospective students should visit this page: http://www.uab.edu/cas/criminaljustice/graduate/msfs

Program Information

The Master of Science in Forensic Science program is designed to prepare individuals for careers in various forensic science and conventional analytical laboratories, emphasizing the application of scientific methods and technologies to legal proceedings. With thoughtful planning, many students have found the program helpful in building a strong foundation to pursue doctoral studies.

The program support includes many UAB faculty members from other departments, personnel from the Alabama Department of Forensic Sciences' Birmingham laboratory, the Jefferson County Medical Examiner's Office, and local forensic science-related private institutions. In addition, the program maintains a close working relationship with the CODIS, Drug Chemistry, and Toxicology disciplines of the Alabama Department of Forensic Sciences and hosts the editorial offices of the Forensic Science Review (the only review journal in forensic science). Faculty research and practice focus especially on forensic aspects of drug chemistry and DNA-based identification.

Minimum admission requirements include a B.S. degree from accredited programs in Chemistry, Biology, or Forensic Science. Coursework is designed for qualified students to begin in fall and complete the program in 21 months. Admission is granted for the fall term only.

According to the National Institute of Justice, students wishing to pursue a career in forensic science should be aware that positions in these fields usually require extensive background checks similar to those required for law enforcement personnel, and are likely a condition of employment. (National Institute of Justice, 2004. Education and Training in Forensic Science: A Guide for Forensic Science Laboratories, Educational Institutions, and Students. NCJ Report 203099. Washington, DC: United States Department of Justice, pp. 7-10).

Graduates from the UAB Master of Science in Forensic Science program are very successful in gaining employment within a year of graduating. Graduates from the MSFS are working in a laboratory or continuing their education (e.g., pursuing a doctorate, professional degree, or second master's degree). Many of the graduates are employed in forensic science laboratories ranging from those operated by the Alabama Department of Forensic Sciences to the Greensboro N.C. Police Department.

Additional Information

Dealine for Entry Term(s)	Fall
Deadline for All Application Materials to be in the Graduate School Office	January 31. Later applications will be considered before July 30th if vacancies are available
Number of Evaluation Forms Required	Three
Entrance Tests	GRE (TOEFL and TWE also required for international applicants whose native language is not English.)

For detailed information, contact Dr. Elizabeth Gardner, UAB Department of Justice Sciences, 1201 University Blvd., Suite 210, Birmingham, Alabama 35294-4562.
Telephone: 205-934-2069
E-mail: eagard@uab.edu
Physical Address (for directions): 1201 University Blvd. Suite 210, Birmingham, AL 35294.

Master of Science in Forensic Science

Must earn a minimum of 3.0 in required courses. An overall minimum GPA of 3.0 is required to remain in good standing.

Plan I - 40 hours with Thesis

Requirements		Hours
GRD 708	Writing Successfully	1
FS 567	Forensic Toxicology	3
FS 670	Elements of Forensic Science	3
FS 671	Conventional Criminalistics	3
FS 673	Forensic Drug Analysis	3
FS 674	Molecular Biology in Forensic Science	3
CJ 675	Law Evidence and Procedure	3
Forensic Seminar		**6**
FS 679	Seminar in Forensic Science (Course shoudl be taken twice for a total of six hours.)	
Directed Research		**6**
FS 699	Thesis Research in Forensic Science	
Leveling Courses (requirements vary by undergraduate background)		**6**
FS 550	Instrumental Analysis	
CH 560	Fundamentals of Biochemistry	
CH 555 & 555L	Quantitative Analysis for Graduate Study and Quantitative Analysis I for Graduate Study Lab	
BY 511	Molecular Genetics	
FS 686	Special Topics in Forensic Science	
Electives		**3**
FS 672	Advanced Conventional Criminalistics	
FS 676	Advanced Biological Methods in Forensic Science	
FS 677	Advanced Drug Chem. & Toxicology	
BST 611	Intermediate Statistical Analysis I	
BST 601	Biostatistics	
FS 680	Graduate Internship in Forensic Science	
Total Hours		**40**

Plan II - 40 hours

Requirements		Hours
GRD 708	Writing Successfully	1
FS 567	Forensic Toxicology	3
FS 670	Elements of Forensic Science	3
FS 671	Conventional Criminalistics	3
FS 674	Molecular Biology in Forensic Science	3
FS 673	Forensic Drug Analysis	3
CJ 675	Law Evidence and Procedure	3
Directed Research (6 hours)		**6**
CJ 698	Directed Research (Non-Thesis)	
Forensic Seminar (taken twice)		**6**
FS 679	Seminar in Forensic Science	
Leveling Courses (requirements vary by undergraduate background)		**6**
FS 550	Instrumental Analysis	
CH 560	Fundamentals of Biochemistry	
CH 555 & 555L	Quantitative Analysis for Graduate Study and Quantitative Analysis I for Graduate Study Lab	
BY 511	Molecular Genetics	
FS 686	Special Topics in Forensic Science	
Electives		**3**
FS 672	Advanced Conventional Criminalistics	
FS 676	Advanced Biological Methods in Forensic Science	
FS 677	Advanced Drug Chem. & Toxicology	
BST 611	Intermediate Statistical Analysis I	
BST 601	Biostatistics	
FS 680	Graduate Internship in Forensic Science	
Total Hours		**40**

Courses

FS 550. Instrumental Analysis. 3 Hours.
This course concerns the theory and practice of instrumental methods for the separation, identification and quantitative analysis of chemical substances. Upon completion of this course, students will have a working knowledge of analytical instrumentation typically employed in chemical/biochemical research and industry laboratories.

FS 565. Cold Case Analysis. 3 Hours.
Introduction to the methods used in analyzing unsolved cases, including innovative uses of technology, 3rd party investigators, and teams.

FS 567. Forensic Toxicology. 3 Hours.
Discussion of drugs and poisons found in biological evidence, including the pharmacokinetic and pharmacodynamic properties of drugs and poisons, evidence collection and handling, selection of the most appropriate evidence, and analytical methods of detection.

FS 572. Molecular Genetics for Forensic Scientists. 3 Hours.
Gene structure, function, and regulation. Chromosome structure and inheritance. An overview of the human genome.

FS 650. Advanced Questioned-Death Investigation. 3 Hours.
Examination of forensic pathology as used in local medical examiners' offices.

FS 653. Advanced Investigation of Fires and Explosions. 3 Hours.
Introduction to arson investigation including overview of specific techniques used in case investigation.

FS 670. Elements of Forensic Science. 3 Hours.
Introduction to philosophical considerations and historic landmarks in the discipline; overview of major sub-disciplines in forensic science; examination of the ethics and expert witnesses and their role in forensic science.

FS 671. Conventional Criminalistics. 3 Hours.
Exploration of basic methodologies and approaches for identifying, collecting, and analyzing trace and pattern evidence, including an overview of microscopy.

FS 672. Advanced Conventional Criminalistics. 3 Hours.
Examination of advanced methods for the analysis of trace and pattern evidence.
Prerequisites: FS 671 [Min Grade: C]

FS 673. Forensic Drug Analysis. 3 Hours.
Exploration of the isolation, identification, and quantification of commonly abused drugs and common poisons; interpretation of findings and correlation with legal applications.

FS 674. Molecular Biology in Forensic Science. 3 Hours.
DNA replication, transcription, and translation. Polymerase chain reaction (PCR) techniques used to amplify human DNA for identification of biological evidence. Methods for identifying and collecting blood and semen stains. DNA extraction. Short tandem repeat typing using capillary electrophoresis.
Prerequisites: FS 572 [Min Grade: C]

FS 676. Advanced Biological Methods in Forensic Science. 3 Hours.
Discussion of current issues and trends in forensic DNA analysis, including advanced analysis of biological evidence samples.
Prerequisites: FS 674 [Min Grade: C]

FS 677. Advanced Drug Chem. & Toxicology. 3 Hours.
Discussion of relevant analyses conducted for drugs and poisons occurring in biological evidence; examination of the pharmacokinetic and pharmacodynamic properties of detected substances.
Prerequisites: FS 567 [Min Grade: C]

FS 679. Seminar in Forensic Science. 3 Hours.
Review of forensic science in the literature. Review, discussion, and presentation of forensic science student research.

FS 680. Graduate Internship in Forensic Science. 1-3 Hour.
Field experience in a forensic science laboratory.
Prerequisites: FS 698 [Min Grade: C] or FS 699 [Min Grade: C]

FS 686. Special Topics in Forensic Science. 3 Hours.
In-depth review of 3-4 topics in forensic science presented by practitioners in the field.

FS 698. Directed Research in Forensic Science (Non-Thesis). 1-6 Hour.
Independent study in a student's substantive area of interest under the direction of a faculty member.
Prerequisites: FS 679 [Min Grade: C]

FS 699. Thesis Research in Forensic Science. 1-6 Hour.
Independent study in a student's substantive area of interest under the direction of a faculty member. Admission to candidacy and successful defense of thesis proposal.
Prerequisites: GAC M

FS 703. Laboratory Rotation III: Drug Analysis. 3 Hours.
Lab Rotation III Drug Analysis.

FS 704. Laboratory Rotation II: Biological Methods. 3 Hours.
Lab Rotation II Biol Methods.

English

Degree Offered:	M.A.
Director:	Rebecca Bach, Ph.D.
Phone:	(205) 934-4250
Email:	rbach@uab.edu
Website:	www.uab.edu/cas/english/

Admission Requirements

For admission in good standing, applicants must meet the Graduate School's requirements for scholarship. The applicant should normally have finished the requirements for an undergraduate degree in English with at least a 3.0 GPA. A generally well-prepared applicant who is lacking in some part of the undergraduate preparation may be admitted with the provision that any deficiencies be removed by a time specified by the graduate program director.

Program Description

Students in the graduate program are required to take a total of 31 hours of coursework including one hour of EH 605 (“Introduction to Graduate Studies in English”) and at least nine hours of literature classes.
In addition, Plan I students must take six hours of EH 699 (“Thesis Research”) and must complete and successfully defend a masters thesis.
All students must take at least 15 hours of coursework at the 600-level, including no more than three hours of EH 698 or EH 699. More detailed coursework options are presented on the English Department website.

Additional Information

Deadline for Entry Term(s):	Each semester
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	Three

For detailed information, contact Dr. Rebecca Bach, Graduate Program Director, Department of English, UH 5065, 1402 10th Avenue South, Birmingham, AL 35294-1260.

Telephone 205-934-4250

E-mail rbach@uab.edu

Web https://www.uab.edu/cas/english/graduate

Master of Arts in English

Students in the graduate program are required to take a total of 31 hours of coursework including one hour of EH 605 (“Introduction to Graduate Studies in English”) and at least nine hours of literature classes.
In addition, Plan I students must take six hours of EH 699 (“Thesis Research”) and must complete and successfully defend a masters thesis; Plan II students must take three hours of EH 697 (“30-Books Semester”) and must propose and then pass a “30-books” examination. All students must take at least 15 hours of coursework at the 600-level, including no more than three hours of EH 698 or EH 699. More detailed coursework options are presented on the English Department website.

Plan I - 31 hours with Thesis

Requirements		Hours
EH 605	Introduction to Graduate Studies in English	1
Select three Literature courses [1]		9
Select any five English graduate courses.		15
EH 699	Thesis Research	6
Total Hours		**31**

Plan II - 31 hours with 30-Books Exam

Requirements		Hours
EH 605	Introduction to Graduate Studies in English	1
Select three Literature courses. [1]		9
Select any six English graduate courses.		18
EH 697	30-Books Semester	3
Total Hours		**31**

[1] **Literature courses:** EH 511, EH 512, EH 513, EH 514, EH 515, EH 516, EH 519, EH 520, EH 521, EH 522, EH 523, EH 524, EH 526, EH 527,EH 531 EH 543, EH 544, EH 546, EH 547, EH 548, EH 560, EH 561, EH 562, EH 563, EH 564, EH 565, EH 566, EH 567, EH 568, EH 569, EH 570, EH 571, EH 573, EH 574, EH 575, EH 576, EH 578, EH 580, EH 581, EH 582, EH 583, EH 585, EH 586, EH 587, EH 588, EH 589, EH 591, EH 677, EH 690, EH 693

Courses

EH 501. Tutoring Writing. 3 Hours.
Designed to improve writing skills through understanding theories of tutoring and to prepare future teachers for tutor training and writing center development.

EH 502. Writing in Popular Periodicals. 3 Hours.
An exploration of current theory regarding the production, distribution, and consumption of popular periodicals and practice contributing to these sources.

EH 503. Business Writing. 3 Hours.
Advanced writing concentration on letters, resumes, and professional reports.

EH 504. Technical Writing. 3 Hours.
Advanced writing concentrating on short informal and long formal reports.

EH 505. Poetry Writing Workshop. 3 Hours.
Advanced work in poetry through critique of student writing. This course may be taken twice for a maximum 6 semester hours of credit.

EH 507. Creative Nonfiction Writing Workshop. 3 Hours.
Advanced work in creative nonfiction through critique of student writing. This course may be taken twice for a maximum 6 semester hours of credit.

EH 509. Fiction Writing Workshop. 3 Hours.
Advanced work in prose fiction through critique of student writing. This course may be taken twice for a maximum 6 semester hours of credit.

EH 510. Fiction Writing Workshop. 3 Hours.
Advanced work in prose fiction through critique of student writing. May be taken twice for credit.

EH 512. Forms of Poetry. 3 Hours.
Songs, sonnets, elegies, odes, and dramatic monologues.

EH 515. Forms of Fiction. 3 Hours.
Intensive study of one or more aspects of fiction. Includes writing and critique in a workshop setting.

EH 519. Young Adult Literature. 3 Hours.
Close reading of young adult literature; its form and history, its assumptions about adolescent psychology, and its literary relationship to the traditional canon.

EH 522. African Literature. 3 Hours.
Selected novels, short stories, autobiographies, folk tales, drama, essays, films, songs from pre-colonial Africa to the present, including works by Emecheta, wa Thiong o, Head, Achebe, Ba, Armah, Laye, Salih, Soyinka, and Abrahams.

EH 523. African Women's Literature. 3 Hours.
Works by African women from pre-colonial Africa to present.

EH 524. African-American Special Topics. 3 Hours.
See Class Schedule for topic. May be repeated.

EH 526. Pre-1800 Literature: Special Topics. 3 Hours.
See Class Schedule for topic. May be repeated.

EH 527. Post-1800 Literature: Special Topics. 3 Hours.
See Class Schedule for topic. May be repeated.

EH 529. Creative Writing: Special Topics. 3 Hours.
See Class Schedule for topic. May be repeated.

EH 530. Professional Writing: Special Topics. 3 Hours.
See Class Schedule for topic. May be repeated.

EH 531. Special Topics in Film. 3 Hours.
In-depth study of a specialized topic in film. The course may focus on a particular national cinema (American, Italian, Japanese, etc.); one or moredirectors (Welles, Hitchock, Kubrick, etc.); a development in film history or genre(the studio system, the French New Wave, the musical, etc.); or issues in visual representation (film theory; adaptation; sexuality in film, etc.).

EH 533. Academic Writing. 3 Hours.
Introduction, for students in all disciplines, to the process of scholarly inquiry and the most common genres of academic writing, including critiques, bibliographies, proposals, conference presentations, and articles.

EH 536. Wkshop Writing for Young Ppl. 3 Hours.
Workshop in writing for young people through critique of student writing.

EH 541. Literary Theory and Criticism I: Ancients to 19 ce. 3 Hours.
Introduction to theories of art and literary production in the contexts of aesthetics and culture from Plato to the end of the nineteenth century.

EH 542. Literary Theory and Criticism II: 20th Cent-Present. 3 Hours.
Introductin to theories of art and literary production in the contexts of aesthetics and culture from Russian formalism to the present.

EH 544. Women's Literature and Theory. 3 Hours.
Literary works and theoretical perspectives of Angelou, Chopin, Hong, Kingston, Hurston, Walker, Woolf, Plath, and others.

EH 546. African-American Autobiography. 3 Hours.
Personal narrative by African Americans, including texts by Wheatley, Douglas, Jacobs, Wilson, Dubois, Johnson, Hurston, Hughes, Wright, Baldwin, Angelou, and Moody. 3 hours.

EH 547. African-American Dramatic Tradition. 3 Hours.
Development of African American Dramatic Tradition from the nineteenth century through the Harlem Renaissance and Black Arts Movement to Contemporary Postmodernism, including Brown, Hurston, Baraka, and Wilson. 3 hours.

EH 548. African-American Poetry Tradition. 3 Hours.
Development of African American Poetry from its early works to the present,including Wheatley, Dunbar, Hughes, Brooks, and Angelou. 3 hours.

EH 550. Advanced Grammar. 3 Hours.
Present-day English grammar.

EH 551. Generative Grammar. 3 Hours.
Advanced analysis of English grammar with emphasis on Chomskyan generative grammar.

EH 552. Grammar and Usage for English Teachers. 3 Hours.
Intensive review of structure of English; usage, punctuation, and style as these relate to grammar.

EH 553. Advanced History of the English Language. 3 Hours.
Advanced topics.

EH 554. The Biology of Language. 3 Hours.
Vocal tract and neuroanatomical specializations for language, language acquisition, genetic language disorders, language and other primates, and evolution of language.

EH 555. Digital Publishing. 3 Hours.
Introduces students to new technologies for digital communication and the ways in which these technologies influence how people read, write, interact with, and share information.

EH 556. Visual Rhetoric. 3 Hours.
The nature of public communication is changing. Although words will never die, images have become a fast and effective medium for persuasion, and any writer who is interested in public communication must now have skills in both the analysis and production of visual rhetoric. Visual Rhetoric offers intensive studies in the rhetorical characteristics of image communication, especially as it intersects with verbal communication. Students in this course will learn strategies for incorporating persuasive images into verbal texts, thus enhancing the overall impact of any document.

EH 557. Writing and Medicine. 3 Hours.
Intensive examination of public discourse focusing on health, illness, and medical practice and production of texts as health consumers and health practitioners.

EH 558. Science Writing. 3 Hours.
Instruction in the research methods and writing genres characteristic of science writing. Emphasis on understanding scientific language and composing documents about science in multiple formats and for multiple audiences.

EH 559. Discourse Analysis. 3 Hours.
Intensive studies in public discourse, with particular emphasis on the social politics of linguistic choices.

EH 561. American Literature 1620-1820. 3 Hours.
Representative American writing from colonial period to Washington Irving.

EH 562. American Literature 1820-1870. 3 Hours.
Representative writers such as Alcott, Cooper, Poe, Hawthorne, Melville, Emerson, Fuller, Fern, Harper, Thoreau, Jacobs, Whitman, Stowe, and Dickinson.

EH 563. American Literature 1870-1914. 3 Hours.
Realism and naturalism: Twain, James, Howell, Crane, Jewett, Wharton, Dre iser, Norris, and Chopin, among others.

EH 564. American Literature 1914-1945. 3 Hours.
Selected fiction, poetry, and drama of major American writers such as Eliot, Faulkner, Hemingway, Hurston, o Neill, and Wright.

EH 566. The Slave Narrative and Its Literary Expressions. 3 Hours.
Genre of slave narrative, its critical theories, and its nineteenth- and twentieth-century literary expressions. Includes Equiano, Jacobs, Wilson, Douglass, DuBois, Wright, Angelou, and Morrison.

EH 567. Black Women Writers. 3 Hours.
Evolution of Afrocentric feminist consciousness through early and contemporary writings.

EH 568. The Harlem Renaissance. 3 Hours.
Black writers during Harlem Renaissance movement. Includes Johnson, Toomer, Murray, Larsen, McKay, Thurman, Reed, and Morrison.

EH 569. Medieval Culture: Literature and Society. 3 Hours.
Exploration through art, literature, and history of dominant themes of Middle Ages, from Germans to Dante and Chaucer.

EH 570. Arthurian Legend. 3 Hours.
King Arthur and his knights in literature from sixth-century history and formulation of legend in Middle Ages to its use in twentieth century.

EH 571. Beowulf in Context. 3 Hours.
An interdisciplinary course in Anglo-Saxon art and culture bearing upon Beowulf, close study of the Norse analogues of the Old English epic. 3 hours.

EH 572. Introduction to Old English. 3 Hours.
An introduction to the language and literature of early medieval England (pre-1100), culminating in analyses of The Dream of the Rood and The Battle of Maldon in the original alliterative verse.

EH 574. English Renaissance Drama(Excluding Shakespeare). 3 Hours.
Plays by Marlowe, Kyd, Jonson, Tourneur, Webster, Middleton, and Ford.

EH 575. English Renaissance Poetry and Prose. 3 Hours.
Topics vary. Broad survey of period or close analysis of genre, theme, or author.

EH 576. Shakespeare. 3 Hours.
King Lear, Othello, and three other plays. Required for English majors.

EH 578. Milton. 3 Hours.
Selected prose and poetry, including Paradise Lost. 3 hours.

EH 581. The Eighteenth Century: Literature and Culture. 3 Hours.
Interdisciplinary exploration of texts that focuses on social, economic, and political backgrounds. Topics and authors vary.

EH 582. The Eighteenth Century: Theory and Interpretation. 3 Hours.
Formal and philosophical implications of selected texts. Authors and topics vary.

EH 583. British Romanticism. 3 Hours.
Blake, Wordsworth, Coleridge, Byron, Shelley, Keats, Hazlitt, Lamb, and DeQuincy.

EH 585. British Victorian Poetry. 3 Hours.
Tennyson, Browning, Arnold, and others.

EH 588. British Novel: The Modern Age. 3 Hours.
Conrad, Lawrence, Joyce, Woolf, Ford, and others. 3 hours.

EH 589. James Joyce. 3 Hours.
Study of James Joyce s fiction through Ulysses.

EH 591. Major Writers. 3 Hours.
See class schedule for topic. May be repeated.

EH 592. Special Topics. 3 Hours.
See class schedule for topic. May be repeated for total of 9 hours.

EH 593. Special Topics in Linguistics. 3 Hours.
See course schedule for topic.
Prerequisites: EH 250 [Min Grade: C] or EH 251 [Min Grade: C]

EH 597. Individual Studies(Non-Thesis Option). 1-3 Hour.
Non-Thesis Research. See Graduate Director for procedure to apply for this course.

EH 599. Film Thesis. 3 Hours.
Thesis on an independently designed topic within film history or film aesthetics, allowing the completion of the interdisciplinary film minor.
Prerequisites: EH 210 [Min Grade: C]

EH 600. Seminar: Engineering Communication. 3 Hours.
Strengthens engineering students understanding of and application of effective communication practices in the workplace. Subjects covered included techniques of audience analysis; production of problem/solution formats; analysis and creation of reports, journal articles, and proposals; and presentation of ideas in written and oral formats.

EH 601. Seminar: Classical Rhetorical Theory. 3 Hours.
Review of Rhetoric from Classical period through Renaissance with emphasis on the works of Plato and Aristotle.

EH 602. Seminar: Modern Rhetorical Theory. 3 Hours.
Advanced studies in twentieth-century theories of rhetoric; themes include Marxism, feminism, philosophy, semantics, and ideology.

EH 604. Research Methods in Composition and Rhetoric. 3 Hours.
Examination of traditional and current methods of research in composition and rhetoric with practice designing and implementing research tied to students interests.

EH 605. Introduction to Graduate Studies in English. 1 Hour.
An introduction to the UAB Graduate Program in English and to the discipline of English. Topics covered will include the discussion of the role of graduate students and graduate assistants, effective use of the university libraries, responsible conduct of research, genres of scholarly publication, conferences and professional societies, the academic job market, etc.

EH 615. Graduate Poetry Writing Workshop. 3 Hours.
Extensive work in poetry resulting in a manuscript of publishable quality.

EH 617. Graduate Creative Nonfiction Writing Workshop. 3 Hours.
Extensive work in creative nonfiction resulting in a manuscript of publishable quality.

EH 619. Graduate Fiction Writing Workshop. 3 Hours.
Extensive work in fiction resulting in a manuscript of publishable quality.

EH 644. Practicum in Teaching Lit.. 3 Hours.
This course focues on the methods and pedagogical philosophy of teaching English and American literature at the early post-secondary level. Required admission to the MA program in English or registration as a non-degree graduate student.

EH 646. Seminar: Practicum in Teaching Writing. 3 Hours.
Theory and practice of teaching writing at the postsecondary level.

EH 647. Practicum in Tutoring Seminar. 1 Hour.
English grammar review and effective tutoring strategies. Prerequisites: students must have been awarded an assistsantship and be scheduled to tutor in the Writing Center. 1 hour.

EH 655. Seminar: History of the English Language. 3 Hours.

EH 677. Seminar: Shakespeare:The Body Gender and Sexuality. 3 Hours.
Investigates languages of the body, sexuality, and gender in seven plays, as well as historical materials and current criticism and theories of the body.

EH 690. Major Writers Seminar. 3 Hours.
See class schedule for announcement of subjects. May be repeated for total of 9 hours credit if focus is on different subjects.

EH 691. Special Topics Seminar in Rhetoric and Composition. 3 Hours.
See class schedule for announcement of subjects. May be repeated for total of 9 hours credit if focus is on different subjects.

EH 693. Special Topics Seminar. 3,6 Hours.
See class schedule for announcement of subjects. May be repeated for total of 9 hours credit if focus is on different subjects.

EH 697. 30-Books Semester. 3 Hours.
The English Graduate Program, Plan II, requires that students prepare a reading list of 30 books, spend a semester reading & studying those books, and then sitting for both written and oral exams. The principal objective of EH 697 is to allow students time to work with their individual mentors to complete this exercise.

EH 698. Directed Studies Seminar. 1-6 Hour.
See departmental description of the M.A. program for special restrictions on this course. Prerequisite: Permission of Associate Chair. 1-3 hours.

EH 699. Thesis Research. 1-6 Hour.
Prerequisites: GAC M

History

To obtain specific admissions requirements on how to apply to Graduate School, prospective students should visit this page: https://www.uab.edu/cas/history/graduate-program

Degree Offered:	M.A.
Director:	Stephen Miller, Ph.D.
Phone:	(205) 975-6531
Email:	sjmiller@uab.edu
Website:	www.uab.edu/history

Students interested in Teaching Certification for Public Schools should contact the School of Education.

Accelerated Learning Opportunities

History offers an accelerated Bachelor's/ Master's (ABM) option for high-achieving undergraduate students pursuing a BA degree in History at UAB. The following courses are approved for shared credit for students pursuing an ABM in History. A successful graduate of ABM will earn both a bachelor's degree and a master's degree in History from the University of Alabama at Birmingham in an accelerated time period compared to the independent completion of the two degrees.

Graduate courses allowed for credit sharing are: HY 601, HY 602, HY 612, HY 614, HY 615, HY 621, HY 622, HY 631, HY 632, HY 634, HY 635, HY 637, HY 638, HY 639, HY 641, HY 650, HY 651, HY 653, HY 654, HY 655, HY 656, HY 670, HY 671, HY 672, HY 673, HY 674, HY 675, HY 681, HY 682, HY 683, HY 693, HY 694

https://www.uab.edu/cas/history/graduate/program-basics

Additional Information

Deadline for Entry Term(s):	Each semester
Deadline for All Application Materials to be in the Graduate School Office:	Fall: August 1; Spring: December 1; Summer: May 1.
Number of Evaluation Forms Required:	Two
Entrance Tests	TOEFL and TWE also required for international applicants whose native language is not English.
Comments	Additional application for financial aid (fellowship or assistantship) is required by program

For detailed information, contact Dr. Stephen Miller, History Graduate Program Director, Department of History, HHB 360Q, 1720 2nd Avenue South, Birmingham, Alabama 35294-1152.

Telephone: (205) 975-6531

E-mail: sjmiller@uab.edu

Master of Arts in History

The history graduate program provides opportunities for students to learn the techniques of research and broaden their knowledge of historical literature. Students may choose Plan I, which includes writing a thesis based on original research using primary sources, or Plan II, which

requires the completion of MA exams in three historical topics. All students are required to enroll in HY 601Historiography and HY 602 Historical Research and Writing and must take at least 30 hours of their course work in graduate seminars. Each student must take a minimum of 9 hours of course work in U.S. history and 9 hours in non-U.S. history (e.g., European, Asian, Latin America, World).

Plan I - 36 hours with Thesis

Requirements		Hours
HY 601	Historiography	3
HY 602	Historical Research and Writing	3
US History [1]		
Three (3) seminars at the 600+ level		9
Non-US History [2]		
Three (3) Seminars at the 600+ level		9
Electives [3]		6
HY 699	Thesis Research	6
Total Hours		**36**

Plan II - 36 hours (non-thesis option)

Requirements		Hours
HY 601	Historiography	3
HY 602	Historical Research and Writing	3
US History [1]		
Three (3) seminars at the 600+ level		9
Non-US History [2]		
Three (3) seminars at the 600+ level		9
Electives [3]		12
Total Hours		**36**

1 **Choose from the following**: HY 612,HY 613, HY 614, HY 621, HY 622, HY 623, HY 631, HY 632, HY 633, HY 634, HY 635, HY 637, HY 638

2 **Choose from the following**: HY 639, HY 641, HY 650, HY 651, HY 652, HY 653, HY 654, HY 655, HY 656 HY 670,HY 671, HY 672, HY 673, HY 674, HY 675, HY 683, HY 693, HY 694

3 Up to two (2) equivalent graduate 600+ level courses in another discipline, i.e., English, Art History, Anthropology, or Government

Courses

HY 601. Historiography. 3 Hours.
Seminar on various theoretical perspectives and methodologies of professional historians. What historians do, how they do it, and why.

HY 602. Historical Research and Writing. 3 Hours.
Methods of historical research, including research in primary sources, and the distinctive characteristics of historical writing.

HY 612. Seminar in Early America. 3 Hours.
Topics and issues in the history and historiography of Colonial North America, circa 1500-1775.

HY 614. Seminar in Recent American History. 3 Hours.
Topics in the politics of modern America.

HY 615. Seminar in American Myths American Values. 3 Hours.
Recommended for students teaching at the secondary-education level and for traditional history students alike. Examines the major myths that inform, and that are informed by, traditional American values and how both shape social relationships.

HY 621. Seminar in Old South History. 3 Hours.
Subjects pertaining to the Old South era to Reconstruction.

HY 622. Seminar in New South History. 3 Hours.
Subjects pertaining to the New South era since Reconstruction.

HY 631. Seminar: Topics in American History. 3 Hours.
Historical topics of American History, (e.g. Conservatism, Crime and Punishment).

HY 632. Seminar in U.S. Urban History. 3 Hours.
Topics in Urban History.

HY 634. Seminar in African American History. 3 Hours.
Selected topics related to the African-American experience.

HY 635. Seminar in American Social History. 3 Hours.
A reading and research seminar examining the history of the structure and power of social groups in America.

HY 637. Seminar in U.S. Labor History. 3 Hours.
Development of labor force and movements in U.S. 19th and 20th centuries.

HY 638. Seminar in Civil Rights History. 3 Hours.
An analysis of history and historiography of Civil Rights Movement in America since the 19th century.

HY 639. Seminar in Women's History. 3 Hours.
An analysis of the changing economic, political, and social roles of women from colonial period to the present.

HY 641. Seminar in Latin American History. 3 Hours.
Issues in history of Latin America since the late 18th century; economic development, dependency and popular resistance, role of the Catholic Church,social revolution, and nationalism.

HY 650. Seminar: Topics in European History. 3 Hours.
Seminar in Historical topics in European History.

HY 651. Seminar in Medieval History. 3 Hours.
Examine political, economical, and religious interaction in the world prior to 1500.

HY 653. Seminar in Modern Europe. 3 Hours.
Reformation to the present; major topics such as soceity and politics, warfare, religious trends, state-building, and industrialization.

HY 654. Seminar in British History. 3 Hours.
Focuses on a particular period or problem in British history. Reading and discussion of current publications on the topic.

HY 655. Seminar in Russian/Soviet History. 3 Hours.
Analysis of primary sources and secondary works dealing with political and social history of Imperial Russia or Soviet Union and their succesor states.

HY 656. Seminar in French History. 3 Hours.
Seminar dealing with various periods and issues in the history of France.

HY 670. Eminar in Pre-Modern History. 3 Hours.
Examine political, economical, and religious interaction in the Mediterranean or Middle Eastern world prior to 1500.

HY 671. Seminar in Asian History. 3 Hours.
Topics in Asian History.

HY 672. Seminar: Topics in World History. 3 Hours.
Seminar in historical topics of world history.

HY 673. Seminar in World Environmental History. 3 Hours.
Comparative examination of cultures and their relationship with the natural environment in a modern world context.

HY 674. Seminar in Comparative History. 3 Hours.
Explores through reading and research varied issues in comparative history;revolution, war, slavery, labor cities, industrialization, and social and cultural topics.

HY 675. Seminar-World Economic History. 3 Hours.
This seminar examines the diverse social, political and ecological contexts in which humans have provided for their material needs.

HY 681. Directed Readings in History. 3-6 Hours.
Individually designed course of readings in various fields. May be repeated. Only two directed reading courses will count toward degree requirements for history majors.

HY 682. Internship in Public Hist/SL. 3 Hours.
Individually designed program that places students in local historical museums and sites to gain professional experience in public history. Service Learning.

HY 683. Seminar in Public History. 3 Hours.
Explores the diverse approaches and methods of presenting history to public audiences, museums, historic sites, architectural preservation, documentary editing, and archival preservation.

HY 693. Special Topics in History. 3 Hours.
Seminar exploring the historiography of a specialized topic in history.

HY 694. Special Topics in History. 3 Hours.
Seminar exploring the historiography of a specialized topic in history.

HY 698. Non-Thesis Research. 3-6 Hours.
Individual research project.

HY 699. Thesis Research. 1-6 Hour.
Research culminating in master's thesis in history.
Prerequisites: GAC M

HY 771. Special Projects in History. 1-3 Hour.
Open only to those who hold the M.A. degree.

Mathematics

The Department of Mathematics offers graduate programs of study leading to the M.S. degree in Mathematics or the Ph.D. in Applied Mathematics.

The master's program aims to give students the background to use mathematics in a variety of ways. We train students in mathematical rigor. This provides training in the ability to analyze and solve problems in all walks of life. We also emphasize the development of communication skills of our students (in the classes they take as well as in the classes they teach). Therefore the M.S. program prepares students not only for a career in secondary or junior college level teaching but provides also a very good preparation for students who go into business, industry, or government. In the past our students have been very successful in obtaining employment. Of course, the M.S. program will also prepare students who wish to pursue a Ph.D. in Mathematics but whose undergraduate education did not provide them with a sufficient background in advanced mathematics to directly enter a Ph.D. program.

The PhD program in Applied Mathematics prepares students interested in an academic career in a college or university as well as students interested in a career in business, industry, or government.

Mathematics

Prospective students that want to apply for admission have to provide academic records, three letters of recommendation, a CV, and an Essay. There are more requirements for international students. UAB charges an application fee, for details please see the admissions page of the Graduate School. The Graduate School requires that all applications are submitted online here via the TargetX application portal, required recommendation letters must also be submitted using this application portal.

Degree Offered	M.S.
Director	Dr. Ioulia Karpeshina
Phone	205-934-2154
E-mail	karpeshi@uab.edu
Website	http://www.uab.edu/cas/mathematics

Program Information

The MS program in Mathematics requires 30 semester hours and prepares students for various careers in teaching, academia, industry, and government.

Tracks

Students take the required courses during the first two semesters, after which they select to continue in one of the two tracks - traditional track or applied track. Both tracks have a thesis or a non-thesis option - Plan I or Plan II.

Deadline for Entry Term(s)	Each semester
Deadline for All Application Materials to be in the Graduate School Office	Six weeks before term begins
Number of Evaluation Forms Required	Three
Entrance Tests	English profenciency test is required for international applicants whose native language is not English.

Additional Information

For detailed information, contact Dr. Ioulia Karpechina, Mathematics Graduate Program Director, UAB Department of Mathematics, UH 4005, 1402 10th Avenue South, Birmingham, Alabama 35294-1241.

Telephone 205-934-2154

E-mail **karpeshi@uab.edu**

Web http://www.uab.edu/cas/mathematics/

Master of Science in Mathematics

The program requires a total of 30 semester hours. All students in their first and second semester are required to take 5 courses (15 credit hours) as indicated below. Based on their chosen track (traditional/pure or applied mathematics), students must select 5 more courses at 500-level or above (15 credit hours). The traditional track is for students who are interested in pure mathematics. The applied mathematics track is focused on preparing students for careers in data science and data analytics, actuarial science and other industrial mathematics applications. Students planning to continue in the Ph.D. program should take the 600-level versions of the required courses.

Plan I - 30 hours Applied Mathematics

Requirements		Hours
Required Courses:		15
MA 540	Advanced Calculus I	
or MA 640	MATHEMATICAL ANALYSIS I	
MA 541	Advanced Calculus II	
or MA 641	MATHEMATICAL ANALYSIS II	
MA 534	Algebra I: Linear	
or MA 631	Linear Algebra	
MA 568	Numerical Analysis I	
or MA 660	Numerical Linear Algebra	
MA 585	Intro to Probability	
Elective courses (choose 3)		9
Algebra		
MA 631	Linear Algebra	
MA 637	Graph Theory and Combinatorics	
MA 660	Numerical Linear Algebra	
Analysis		
MA 544	Vector Analysis	
MA 545	Complex Analysis	
MA 553	Fourier Analysis	
MA 554	Intermediate Differential Equations	
MA 555	Partial Differential Equations I	
MA 556	Partial Differential Equations II	
MA 561	Modeling with Partial Differential Equations	
MA 562	Intro to Stochastic Differential Equations	
MA 566	Introduction to Optimization	
MA 642	Calculus of Several Variables	
MA 650	Differential Equations	
MA 655	Partial Differential Equations	
MA 661	Modeling With PDE	
Numerical Analysis		
MA 560	Scientific Programming	
MA 567	Gas Dynamics	
MA 569	Numerical Analysis II	
MA 660	Numerical Linear Algebra	
MA 665	Partial Differential Equations: Finite Differential Methods	
MA 668	Numerical Analysis I	
MA 669	Numerical Analysis II	
Probability/Statistics		
MA 562	Intro to Stochastic Differential Equations	
MA 584	Mathematical Finance	
MA 586	Mathematical Statistics	
MA 587	Advanced Probability	
MA 588	Advanced Statistics	
MA 687	Advanced Probability	
MA 688	Advanced Statistics	
MA 699	Research for Thesis	6
Total Hours		**30**

Plan II - 30 hours Applied Mathematics

Requirements		Hours
Required Courses:		15
MA 540	Advanced Calculus I	
or MA 640	MATHEMATICAL ANALYSIS I	
MA 541	Advanced Calculus II	
or MA 641	MATHEMATICAL ANALYSIS II	
MA 534	Algebra I: Linear	
or MA 631	Linear Algebra	
MA 568	Numerical Analysis I	
or MA 660	Numerical Linear Algebra	
MA 585	Intro to Probability	
Elective Courses (choose 5)		15
Algebra		
MA 631	Linear Algebra	
MA 637	Graph Theory and Combinatorics	
MA 660	Numerical Linear Algebra	
Analysis		
MA 544	Vector Analysis	
MA 545	Complex Analysis	
MA 553	Fourier Analysis	
MA 554	Intermediate Differential Equations	
MA 555	Partial Differential Equations I	
MA 556	Partial Differential Equations II	
MA 561	Modeling with Partial Differential Equations	
MA 562	Intro to Stochastic Differential Equations	
MA 566	Introduction to Optimization	
MA 642	Calculus of Several Variables	
MA 650	Differential Equations	
MA 655	Partial Differential Equations	
MA 661	Modeling With PDE	
Numerical Analysis		
MA 560	Scientific Programming	
MA 567	Gas Dynamics	
MA 569	Numerical Analysis II	
MA 660	Numerical Linear Algebra	
MA 665	Partial Differential Equations: Finite Differential Methods	
MA 668	Numerical Analysis I	
MA 669	Numerical Analysis II	
Probability/Statistics		
MA 562	Intro to Stochastic Differential Equations	
MA 584	Mathematical Finance	
MA 586	Mathematical Statistics	
MA 587	Advanced Probability	
MA 588	Advanced Statistics	
MA 687	Advanced Probability	
MA 688	Advanced Statistics	
Total Hours		**30**

Plan I - 30 hours Traditional/Pure Mathematics

Requirements		Hours
Required Courses		15
MA 540	Advanced Calculus I	
or MA 640	MATHEMATICAL ANALYSIS I	
MA 541	Advanced Calculus II	
or MA 641	MATHEMATICAL ANALYSIS II	
MA 534	Algebra I: Linear	
or MA 631	Linear Algebra	
MA 568	Numerical Analysis I	

or MA 660	Numerical Linear Algebra	
MA 585	Intro to Probability	
Elective Courses (choose 3)		9
Algebra		
MA 535	Algebra II: Modern	
MA 631	Linear Algebra	
MA 632	Abstract Algebra	
MA 637	Graph Theory and Combinatorics	
Analysis		
MA 544	Vector Analysis	
MA 545	Complex Analysis	
MA 554	Intermediate Differential Equations	
MA 555	Partial Differential Equations I	
MA 556	Partial Differential Equations II	
MA 642	Calculus of Several Variables	
MA 645	Real Analysis I	
MA 646	Real Analysis II	
MA 648	Complex Analysis	
MA 650	Differential Equations	
Geometry		
MA 570	Differential Geometry	
MA 572	Geometry I	
MA 573	Geometry II	
MA 675	Differential Geometry	
Probability/Statistics		
MA 586	Mathematical Statistics	
MA 587	Advanced Probability	
MA 588	Advanced Statistics	
MA 687	Advanced Probability	
MA 688	Advanced Statistics	
Topology		
MA 574	Intro to Topology I	
MA 575	Intro to Topology II	
MA 670	Topology I	
MA 671	Topology II	
MA 699	Research for Thesis	6
Total Hours		**30**

Plan II - 30 hours Traditional/Pure Mathematics

Requirements		Hours
Required Courses		15
MA 540	Advanced Calculus I	
or MA 640	MATHEMATICAL ANALYSIS I	
MA 541	Advanced Calculus II	
or MA 641	MATHEMATICAL ANALYSIS II	
MA 534	Algebra I: Linear	
or MA 631	Linear Algebra	
MA 568	Numerical Analysis I	
or MA 660	Numerical Linear Algebra	
MA 585	Intro to Probability	
Elective Courses (choose 15)		15
Algebra		
MA 535	Algebra II: Modern	
MA 631	Linear Algebra	
MA 632	Abstract Algebra	
MA 637	Graph Theory and Combinatorics	
Analysis		
MA 544	Vector Analysis	
MA 545	Complex Analysis	
MA 554	Intermediate Differential Equations	
MA 555	Partial Differential Equations I	
MA 556	Partial Differential Equations II	
MA 642	Calculus of Several Variables	
MA 645	Real Analysis I	
MA 646	Real Analysis II	
MA 648	Complex Analysis	
MA 650	Differential Equations	
Geometry		
MA 570	Differential Geometry	
MA 572	Geometry I	
MA 573	Geometry II	
MA 675	Differential Geometry	
Probability/Statistics		
MA 586	Mathematical Statistics	
MA 587	Advanced Probability	
MA 588	Advanced Statistics	
MA 687	Advanced Probability	
MA 688	Advanced Statistics	
Topology		
MA 574	Intro to Topology I	
MA 575	Intro to Topology II	
MA 670	Topology I	
MA 671	Topology II	
Total Hours		**30**

Applied Mathematics

Prospective students that want to apply for admission have to provide academic records, three letters of recommendation, a CV, an Essay, and scores of the Graduate Record Examination (GRE), General Test. There are more requirements for international students. UAB charges an application fee, for details please see the admissions page of the Graduate School. The Graduate School requires that all applications are submitted online here via the TargetX application portal, required recommendation letters must also be submitted using this application portal.

Program Information

Mathematics has always been divided into a pure and an applied branch. However, these have never been strictly separated. The Ph.D. program in applied mathematics stresses the interconnection between pure mathematics and its diverse applications.

Admission

Only students with a firm foundation in advanced calculus, algebra, and topology are considered for immediate admission to the Ph.D. program. A student lacking this background will be considered for admission to the M.S. program. Upon passing the qualifying examination, a student may transfer to the Ph.D. program. We expect at least a B average in a student's previous work and a score above 158 on each section of the Graduate Record Examination General Test.

Program of Study

Each student in the Ph.D. program has to take the following steps:

- Passing the Joint Program Exam (JPE), also called the Qualifying Exam. The Joint Program Examinations in Real Analysis and Linear Algebra are given during two periods each year (one in May and one in September). During each period a student may take one or both of the exams but subject to the following restrictions: (1) either exam may be attempted at most twice and (2) a student may participate in exams during no more than three periods.
- Completing 54 semester hours of graduate courses. The grade of each course has to be at least a B. The student's supervisory committee and the Joint Program Committee must approve the selection of courses. At least 18 hours must be in a major area of concentration, selected so that the student will be prepared to conduct research in an area of applied mathematics, while at least 12 hours have to be in a minor area of study, which is a subject outside mathematics. No courses counted towards an MS degree can be used. There are additional requirements by the UAB Graduate School, see "Minimum Course Requirements" in the Graduate Catalog.
- Passing a language or tool of research exam.
- Passing the Comprehensive Exam, which consists of a written part and an oral part.
- Preparing a dissertation, which must be a genuine contribution to mathematics.
- Passing the Final Examination (thesis defense).

Additional Information

For detailed information, contact Dr. Ioulia Karpechina, Mathematics Graduate Program Director, UAB Department of Mathematics, UH 4005, 1402 10th Avenue South, Birmingham, Alabama 35294-1241.

Telephone: 205-934-2154

Web http://www.uab.edu/cas/mathematics/

Courses

MA 501. History of Mathematics I. 3 Hours.
Development of mathematical principles and ideas from a historical viewpoint, and their cultural, educational and social significance; earliest origins through Newton and Leibnitz.
Prerequisites: MA 125 [Min Grade: C] or MA 225 [Min Grade: C]

MA 502. History of Mathematics II. 3 Hours.
Development of mathematical principles and ideas from a historical viewpoint, and their cultural, educational and social significance; Newton and Leibnitz through early 20th century.
Prerequisites: MA 501 [Min Grade: B] or MA 311 [Min Grade: B]

MA 511. Integrating Mathematical Ideas. 3 Hours.
This course will integrate ideas from algebra, geometry, probability, and statistics. Emphasis will be on using functions as mathematical models, becoming fluent with multiple representations of functions, and choosing the most appropriate representations for solving a specific problem. Students will be expected to communicate mathematics verbally and in writing through small group, whole group, and individual interactions.

MA 513. Mathematics for Elementary and Middle School Teachers. 3 Hours.
Problem solving experiences, inductive and deductive reasoning, patterns and functions, some concepts and applications of geometry for elementary and middle school teachers. Topics include linear and quadratic relations and functions and some cubic and exponential functions. Number sense with the rational number system including fractions, decimals and precents will be developed in problem contexts. An emphasis will be on developing algebriac thinking and reasoning.

MA 514. Mathematics for Elementary and Middle School Teachers. 3 Hours.
Problem solving experiences, inductive reasoning, concepts and applications of geometry and proportional reasoning for elementary and middle school teachers. Topics include analysis of one, two and three dimensional feature of real objects, ratio and proportionality, similarity and congruence, linear, area, and volume measurement, and the development of mathematically convincing arguments. An emphasis will be on developing thinking and reasoning.
Prerequisites: MA 313 [Min Grade: C] or MA 513 [Min Grade: C]

MA 515. Probabilistic & Stat Reasoning. 3 Hours.
Descriptive and inferential statistics, probability, estimation, hypothesis testing. Reasoning with probability and statistics is emphasized.
Prerequisites: MA 313 [Min Grade: C] or MA 513 [Min Grade: C]

MA 516. Numerical Reasoning. 3 Hours.
Develop understanding of number and improve numerical reasoning skills specifically with regard to place value, number relationship that build fluency with basis facts, and computational proficiency; developing a deep understanding of numerous diverse computational algorithms; mathematical models to represent fractions, decimals and percents, equivalencies and operations with fractions, decimals and percents; number theory including order of operations, counting as a big idea, properties of number, primes and composites, perfect, abundant and significant numbers, and figurate numbers; inductive and deductive reasoning with number.
Prerequisites: MA 313 [Min Grade: C] or MA 513 [Min Grade: C]

MA 517. Extending Algebraic Reasoning. 3 Hours.
Extending Algebraic Reasoning. Extending algebraic and functional reasoning to polynomials, rational, exponential, and logarithmic functions; problem-solving involving transfer among representations (equation, graph, table); proof via symbolic reasoning, contradiction, and algorithm; interpretation of key points on graphs (intercepts, slope, extrema); develop facility and efficiency in manipulating symbolic representations with understanding; appropriate use of technology and approximate versus exact solutions; functions as models.
Prerequisites: MA 313 [Min Grade: C] or MA 513 [Min Grade: C]

MA 519. Special Topics for Teachers. 1-4 Hour.
With permission of instructor, may be used as continuation of any of MA 513 through 518. May be repeated for credit when topics vary.
Prerequisites: MA 125 [Min Grade: C] or MA 225 [Min Grade: C]

MA 534. Algebra I: Linear. 3 Hours.
Abstract vector spaces, subspaces, dimension, bases, linear transformation, matrix algebra, matrix representations of linear transformations, determinants.
Prerequisites: MA 124 [Min Grade: C] or MA 126 [Min Grade: C] or MA 226 [Min Grade: C]

MA 535. Algebra II: Modern. 3 Hours.
Rings, including the rings of integers and of polynomials, integral domains, fields and groups. Homomorphism, isomorphism. As time permits, Galois theory, semi-groups, quotient groups, models, or other areas of algebra may be included. Students present proofs from a list of pre-assigned theorems to the class. Logical correctness and proper mathematical proof-writing style are assessed.
Prerequisites: MA 434 [Min Grade: C] or MA 534 [Min Grade: C]

MA 540. Advanced Calculus I. 3 Hours.
This class covers sequences and series of real numbers, supremum and infimum limits for subsets of the real numbers, the theorem of Bolzano-Weierstrass, Cauchy sequences, continuous functions, intermediate value theorem, uniform continuity, monotone functions. In addition, derivatives - mean value theorem, Taylor's theorem for real functions on a real interval, Riemann integration for functions on a real interval, improper integrals.

MA 541. Advanced Calculus II. 3 Hours.
This class covers sequences of functions, including pointwise and uniform convergence and the specifics of interchanging limits. Series of functions, including the M-test, differentiation/integration and real analytic functions will be studied. We introduce metric spaces and develop the notions of open and closed sets, completeness and compactness, Cauchy sequences, continuous functions between metric spaces, uniform continuity, Heine-Borel and related theorems, contraction mapping theorem, Arzela-Ascoli theorem.
Prerequisites: MA 540 [Min Grade: C]

MA 544. Vector Analysis. 3 Hours.
Review and applications of multiple integrals, Jacobians and change of variables in multiple integrals; line and surface integrals; theorems of Green, Gauss, and Stokes with application to the physical sciences; computation in spherical and cylindrical coordinates.
Prerequisites: MA 227 [Min Grade: C]

MA 545. Complex Analysis. 3 Hours.
Analytic functions, complex integration and Cauvchy's theorem, Taylor and Laurent series, calculus of residues and applications, conformal mappings.
Prerequisites: MA 227 [Min Grade: C]

MA 553. Fourier Analysis. 3 Hours.
Fourier series, including odd/even functions expansions, complex power series, generalized Fourier series. Convergence, applications to partial differential equations. Fourier transform: basic properties, inversion of the FT, windowing, relation to the Laplace transform. Applications to partial differential equations. Wavelets and signal processing basic functions, transforming wavelets, short time Fourier transform.
Prerequisites: MA 252 [Min Grade: C]

MA 554. Intermediate Differential Equations. 3 Hours.
Topics from among Frobenius series solutions, Sturm-Liouville systems, nonlinear equations, and stability theory.
Prerequisites: MA 252 [Min Grade: C]

MA 555. Partial Differential Equations I. 3 Hours.
Classification of second order partial differential equations; background on eigenfunction expansions and Fourirer series; integrals and transforms; solution of the wave equation, reflection of waves; solution of the heat equation in bounded and unbounded media; Laplace s equations, Dirichlet and Neumann problems.
Prerequisites: MA 252 [Min Grade: C]

MA 556. Partial Differential Equations II. 3 Hours.
Classification of second order partial differential equations; background on eigenfunction expansions and Fourirer seriers; integrals and transforms; solutions of the wave equations, reflection of waves; solution of heat equation in bounded and unbounded media; Laplace s equations, Dirichlet and Neumann problems.
Prerequisites: MA 252 [Min Grade: C]

MA 560. Scientific Programming. 3 Hours.
Programming and mathematical problem solving using Matlab, Python, FORTRAN or C++. Emphasizes the systematic development of algorithms and numerical methods. Topics include computers, floating point arithmetic, iteration, functions, arrays, Matlab graphics, image processing, robotics, GNU/Linux operating system, solving linear systems and differential equation arising from practical situations, use of debuggers and other debugging techniques, and profiling; use of callable subroutine packages like LAPACK and differential equation routines; parallel programming. Assignments and projects are designed to give students a computational sense through complexity, dimension, inexact arithmetic, randomness, simulation and the role of approximation.
Prerequisites: MA 126 [Min Grade: C] or MA 226 [Min Grade: C]

MA 561. Modeling with Partial Differential Equations. 3 Hours.
Practical examples of partial differential equations; derivation of partial differential equations from physical laws; introduction to COMSOL Multiphysics using practical examples; specialized modeling projects selected from topics such as groundwater modeling, scattering of waves, medical and industrial imaging, traffic flows, continuum mechanics and deformation of solids, Fluid mechanics including the class boat race, financial derivative modeling, and acoustic and electromagnetic wave applications. Written project reports required for homework assignments in addition to online quizzes. Quantitative Literacy and Writing are significant components of this course.
Prerequisites: MA 227 [Min Grade: C] or MA 252 [Min Grade: C]

MA 562. Intro to Stochastic Differential Equations. 3 Hours.
Stochastic differential equations arise when random effects are introduced into the modeling of physical systems. Topics include Brownian motion and Wiener processes, stochastic integrals and the Ito calculus, stochastic differential equations, and applications to financial modeling, including option pricing.
Prerequisites: MA 485 [Min Grade: C] or MA 585 [Min Grade: C]

MA 566. Introduction to Optimization. 3 Hours.
Optimization is important in many decision making problems in various areas like engineering, economics and machine learning. Optimization theory deals with finding the best solution(s) or variables of a given objective function. Recently, the area of optimization has received much attention due to the development of highly efficient computational methods for data analysis. The scope of this course covers linear algebra, unconstrained optimization, linear programming, and nonlinear constrained optimization. The topics include linear algebra, linear program, duality, network flows, simplex method, non-simplex method, gradient and conjugate methods, neural network, genetic algorithm and convex optimization. The course will also introduce optimization algorithms and codes via python and matlab.
Prerequisites: MA 126 [Min Grade: C] or MA 226 [Min Grade: C]

MA 567. Gas Dynamics. 3 Hours.
Euler s equations for inviscid flows, rotation and vorticity, Navier-Stok.
Prerequisites: MA 252 [Min Grade: C] and (MA 360 [Min Grade: C] or MA 560 [Min Grade: C])

MA 568. Numerical Analysis I. 3 Hours.
Sources of error and conditioning. Solution of algebraic equations in one variable: Bisection method, Fixed point iteration method, Newton's method and its variants, and their conver-gence. Approximation and interpolation: Monomial and Lagrange interpolations, Newton's divided difference form, Hermite interpolation, and Cubic spline. Numerical differentiation: Deriving formulas using Taylor series, Truncation error, and Richardson extrapolation. Nu-merical integration: Open and closed Newton-Cotes formulas, Composite numerical inte-gration, Romberg integration, and Gaussian quadrature. Solution of Ordinary Differential Equations (ODEs): Initial value ODEs, Euler's method, Runge-Kutta methods, Multi-step methods, and Boundary value ODEs. Practice on the computer.
Prerequisites: MA 252 [Min Grade: C] and MA 227 [Min Grade: C]

MA 569. Numerical Analysis II. 3 Hours.
Direct methods for linear systems: Gaussian elimination and back substitution, Pivoting strategies, Matrix factorization: LU and Cholesky decomposition, and Estimating errors and the condition number. Iterative solution of systems of nonlinear equations: Fixed points for functions of several variables, Newton's method, Quasi-Newton methods, Steep-est Descent method. Evaluation of eigenvalues and eigenvectors of matrices: Existence and uniqueness, Orthogonal matrices and similarity transformations, Power method and vari-ants, Generalized eigenvalue problems, Householder's Method, QR algorithm, and Singular Value Decomposition (SVD). Practice on the computer.
Prerequisites: MA 568 [Min Grade: C]

MA 570. Differential Geometry. 3 Hours.
Theory of curves and surfaces: Frenet formulas for curves, first and second fundamental forms of surfaces. Global theory; abstract surfaces, manifolds, Riemannian geometry.
Prerequisites: MA 126 [Min Grade: C] or MA 226 [Min Grade: C]

MA 572. Geometry I. 3 Hours.
The axiomatic method; Euclidean geometry including Euclidean constructions, basic analytic geometry, transformational geometry, and Klein's Erlangen Program. Students present proofs from a list of pre-assigned theorems to the class. Logical correctness and proper mathematical proof-writing style are assessed.
Prerequisites: MA 125 [Min Grade: C] or MA 225 [Min Grade: C]

MA 573. Geometry II. 3 Hours.
Analytical geometry, Birkhoff s axioms, and the complex plane; structure and representation of Euclidean isometries; plane symmetries; non-Euclidean (hyperbolic) geometry and non-Euclidean transformations; fractal geometry; algorithmic geometry. Course integrates intuition/exploration and proof/explanation. Project and report or oral presentation required.
Prerequisites: MA 472 [Min Grade: C] or MA 572 [Min Grade: C]

MA 574. Intro to Topology I. 3 Hours.
Separable metric spaces, basis and sub-basis, continuity, compactness, completeness, Baire category theorem, countable products, general topological spaces, Tychonov theorem.
Prerequisites: MA 126 [Min Grade: C] or MA 226 [Min Grade: C]

MA 575. Intro to Topology II. 3 Hours.
Separable metric spaces, basis and sub-basis, continuity, compactness, completeness, Baire category theorem, countable products, general topological spaces, Tychonov theorem.
Prerequisites: MA 574 [Min Grade: C]

MA 584. Mathematical Finance. 3 Hours.
The notion of no arbitrage. Interest, compounding, bonds. Review of mean, variance, and covariance. Portfolio management: risk and return. Forwards and Futures. Put-call parity. Martingales and conditional expectation. The binomial model. Fundamental theorems of asset pricing. Brownian motion (heuristics). Ito's formula and Girsanov's theorem (heuristics). The Black-Scholes-Merton formula. Interest rates. The binomial model for stochastic interest rates.
Prerequisites: (MA 260 [Min Grade: C] or MA 434 [Min Grade: C] or MA 435 [Min Grade: C]) and (MA 485 [Min Grade: C] or MA 585 [Min Grade: C])

MA 585. Intro to Probability. 3 Hours.
Combinatorics, probability spaces, combinatorics, conditional probabilities and independence, Bayes rule, discrete and continuous distributions, mean value and variance, random variables, joint distributions, correlation, Law of Large Numbers, Central Limit Theorem.
Prerequisites: MA 227 [Min Grade: C] and MA 260 [Min Grade: C]

MA 586. Mathematical Statistics. 3 Hours.
Sampling techniques and data analysis, Describing data distributions, Point estimation, Statistical inference, Confidence intervals, Tests for binomials, Tests for normals, Hypothesis testing, Two-factor analysis, Goodness-of-Fit test, Contingency tables.
Prerequisites: MA 485 [Min Grade: C] or MA 585 [Min Grade: C] or MA 685 [Min Grade: C]

MA 587. Advanced Probability. 3 Hours.
Foundation of probability, conditional probabilities, and independence, Bayes theorem, discrete and continuous distributions, joint distributions, conditional and marginal distributions, convolution, moments and moment generation function, multivariable normal distribution and sums of normal random variables, Markov chains.
Prerequisites: MA 485 [Min Grade: C] or MA 585 [Min Grade: C] or MA 685 [Min Grade: C]

MA 588. Advanced Statistics. 3 Hours.
Parameter estimations, Maximum likelihood estimation, Sufficient statistic, Rao-Cramer bound, Hypothesis testing, Neyman-Pearson Lemma, p-value, Regression, Order statistics, Nonparametric methods: Wilcoxon test, Run test, and Kolmogorov-Smirnov test, Anderson-Darling test, P-P plot, Q-Q plot, testing for distribution type, location and scale parameters, mean squared error.
Prerequisites: MA 485 [Min Grade: C] or MA 486 [Min Grade: C] or MA 585 [Min Grade: C] or MA 586 [Min Grade: C] or MA 587 [Min Grade: C] or MA 685 [Min Grade: C] or MA 687 [Min Grade: C]

MA 589. STATISTICAL TECHNIQUES FOR MACHINE LEARNING AND BIG DATA. 3 Hours.
Topics of statistical learning and how to implement these methods by using R/Python. The course will cover major statistical learning methods and concepts for both supervised and unsupervised learning, such as sampling algorithms; nonparametric tests; model assessment and selection; classification, clustering; and big data analysis.
Prerequisites: MA 486 [Min Grade: B] or MA 586 [Min Grade: B]

MA 590. Mathematics Seminar. 1-3 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 591. Mathematics Seminar. 1-3 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 592. Special Topics in Mathematics. 1-3 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 593. Special Topics in Mathematics. 1-3 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 594. Special Topics in Mathematics. 1-6 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 595. Special Topics in Mathematics. 1-6 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 596. Special Topics in Mathematics. 1-12 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 597. Special Topics in Mathematics. 1-12 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 598. Research in Mathematics. 1-12 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 599. Research in Mathematics. 1-12 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 610. Intro to Set Theory. 3 Hours.
Set theory, products, relations, orders and functions, cardinal and ordinal numbers, transfinite induction, axiom of choice, equivalent statements.

MA 631. Linear Algebra. 3 Hours.
Vector spaces and their bases; linear transformations; eigenvalues and eigenvectors: Jordan canonical form; multilinear algebra and determinants; norms and inner products.

MA 632. Abstract Algebra. 3 Hours.
Propositional and predicate logic; set, relations, and functions; the induction principle; Groups, in particular symmetry groups, permutations groups, and cyclic groups; cosets and quotient groups; group homomorphisms; rings, integral domains, and fields; ideals and rings homomorphisms; factorization; polynomial rings.
Prerequisites: MA 534 [Min Grade: B] or MA 631 [Min Grade: B]

MA 637. Graph Theory and Combinatorics. 3 Hours.
Topics covered include specialized terminology and notation; eulerian and hamiltonian graphs; matrices of graphs and information about graphs obtained from matrices; topological graph theory, including planarity theorems of Kuratowski, Whitney and MacLane and also embeddings of graphs in surfaces of higher genus and in nonorientable surfaces; Menger's theorem and network flows; the graph reconstruction problem; counting techniques, including the Pigeonhole Principle and the use of generating functions; Dilworth's theorem; Sperner's lemma; finite and infinite Ramsey theory; matching theory and the classical theorem of Philip Hall; and, if time permits, the Polya/Redfield theory of enumerations.

MA 640. MATHEMATICAL ANALYSIS I. 3 Hours.
The course introduces basic objects in analysis, such as the structure of the real numbers, the rationals, sequences of real numbers, the concepts of lim, lim inf; lim inf Further on, the Bolzano-Weierstrass theorem and the Cauchy sequences are discussed in detail. The relevant material is in Sections 2.1, 2.2, 2.3, 2.4, [1]. Next, another basic object, continuous functions is introduced and analyzed. In particular, the min-max theorem, the intermediate value theorem, uniform continuity for continuous functions and its relation with continuity, Sections 3.2, 3.3, 3.4, 3.5, 3.6 [1]. Another classical object, the derivative of a function of one variable is introduced. Classical results such as the mean value theorem, the Taylor's theorem for real functions on a real interval are covered along with applications, Sections 4.1, 4.2, 4.3 [1]. Finally, the theory of the Riemann integration for functions on a real interval is build. The relevant material is contained in Sections 5.1, 5.2, 5.3, 5.5, [1].

MA 641. MATHEMATICAL ANALYSIS II. 3 Hours.
The course is a continuation of MA 640 and provides a necessary prerequisite to a number of standard higher Ph.D. level courses, such as Topology, Measure theory, Numerical Analysis, Functional Analysis etc. Speci#cally, sequences of functions are introduced, and of particular interest will be pointwise and uniform convergence, interchange of limits to name a few. This is mostly a prerequisite to-ward an important object in the theory, namely series of functions. Various convergence tests are discussed and analyzed: comparison test, M - test, Dirichlet test, integral test. Finally, the theory of di#erentiation and integration for series is developed, including properties of power series/real analytic functions. The course #nishes with a short introduction to some basic topological objects. Speci#cally, metric spaces are introduced. Important concepts in this context include open and closed sets, completeness and compactness, Cauchy sequences. Continuous functions between metric spaces and uniform continuity of such functions are discussed, together with various applications. Finally, the Heine-Borel and related theorems, the contraction mapping theorem, and the Arzela-Ascoli theorem are proved in detail, together with relevant applications.
Prerequisites: MA 640 [Min Grade: B]

MA 642. Calculus of Several Variables. 3 Hours.
Functions of several variables; total and partial derivatives; the Implicit Function Theorem; integration of differential forms; Stokes's Theorem.
Prerequisites: MA 541 [Min Grade: B]

MA 645. Real Analysis I. 3 Hours.
Abstract measures and integration; positive Borel measures; Lp-spaces.
Prerequisites: MA 642 [Min Grade: B] and MA 670 [Min Grade: B]

MA 646. Real Analysis II. 3 Hours.
Complex measures and the Radon-Nikodym theorem; differentiation; integration on product spaces and Fubini s theorem.
Prerequisites: MA 645 [Min Grade: B]

MA 648. Complex Analysis. 3 Hours.
The algebraic and topological structure of the complex plane; analytic functions; Cauchy's integral theorem and integral formula; power series; elementary functions; and their Riemann surfaces; isolated singularities and residues; the Laurent expansion; the Riemann mapping theorem.
Prerequisites: MA 642 [Min Grade: B]

MA 650. Differential Equations. 3 Hours.
Separable, linear, and exact first order equations; existence and uniqueness theorems; continuous dependence of solutions on data and initial conditions; first order systems and higher order equations; stability for two-dimensional linear systems; higher order linear systems; boundary value problems; stability theory.
Prerequisites: MA 642 [Min Grade: B]

MA 655. Partial Differential Equations. 3 Hours.
This course covers first order partial differential equations, elliptic equations, parabolic equations, and hyperbolic equations.
Prerequisites: MA 642 [Min Grade: C] or MA 650 [Min Grade: C]

MA 660. Numerical Linear Algebra. 3 Hours.
Vector and matrix norms. Singular Value Decomposition (SVD). Stability, condition num-bers, and error analysis. QR factorization. Least squares problems; Computation of eigen-values and eigenvectors: Power method and variants. Iterative methods for linear systems: Stationary iteration and relaxation methods, Convergence of stationary methods, Conju-gate gradient method, Krylov subspace methods, and Multigrid methods.
Prerequisites: MA 631 [Min Grade: B]

MA 661. Modeling With PDE. 3 Hours.
Practical examples of partial differential equations; derivation of partial differential equations from physical laws; introduction to MATLAB and its PDE Toolbox, and other PDE packages such as FEMLAB using practical examples; brief discussion of finite difference and finite element solution methods; introduction to continuum mechanics and classical electrodynamics; parallel programming using MPI and the mathematics department Beowulf system; specialized modeling projects in topics such as groundwater modeling, scattering of waves, medical and industrial imaging, fluid mechanics, and acoustic and electromagnetic applications.

MA 665. Partial Differential Equations: Finite Differential Methods. 3 Hours.
Review of difference methods for ordinary differential equations including Runge-Kutta, multi-step, adaptive step-sizing, and stiffness; finite difference versus finite element; elliptic boundary value problems; iterative solution methods, self-adjoint elliptic problems; parabolic equations including consistency, stability, and convergence, Crank-Nicolson method, method, method of lines; first order hyperbolic systems and characteristics Lax-Wendroff schemes, methods of lines for hyperbolic equations.
Prerequisites: MA 360 [Min Grade: C] or MA 560 [Min Grade: C] or MA 455 [Min Grade: C] or MA 555 [Min Grade: C]

MA 668. Numerical Analysis I. 3 Hours.
Iterative solution of algebraic equations in one variable: Bisection method, Fixed point iter-ation method, and Newton's method and it variants. Review of linear algebra background: Basic concept of linear algebra, Vector and matrix norms, Special classes of matrices: Sym-metric positive definite matrices, Orthogonal vectors and matrices, and Singular values. Direct methods for solving linear systems: Gaussian elimination, LU decomposition, Piv-oting strategies, Cholesky decomposition, Computational complexity, Sparse matrix, Per-mutation and ordering strategies, Estimating errors and condition number. Linear least squares problems: Normal equations. Polynomial interpolation: General approximation and interpolation, Monomial, Lagrange, and Newton's divided difference polynomial in-terpolations, Chebyshev interpolation, Piecewise polynomial interpolation and their error analysis. Numerical integration: Basic quadrature algorithms, Composite numerical inte-gration, Gaussian and Adaptive quadrature, and their error analysis. Numerical solution of ordinary differential equations: Euler's method, Multistep methods, stability and stiffness, Explicit vs. implicit methods, Truncation error, and Order of convergence.
Prerequisites: MA 670 [Min Grade: B]

MA 669. Numerical Analysis II. 3 Hours.
Numerical solution of partial differential equations using Finite Element Methods (FEM) which includes, Finite element spaces, Sobolev spaces, Interpolating theory, Variational for-mulation, Lax-Milgram Theorem, Stability analysis, Error estimation, and implementation of FEM library in one and higher dimensions problems.
Prerequisites: MA 668 [Min Grade: B]

MA 670. Topology I. 3 Hours.
Definition of topologies; closure; continuity; finite product topology; metric spaces; connectedness; completeness and compactness (in particular, in metric spaces).
Prerequisites: MA 631 [Min Grade: B] or MA 540 [Min Grade: B] or MA 440 [Min Grade: B]

MA 671. Topology II. 3 Hours.
Product topology; quotient spaces; countability and separation axioms; Tychonoff's theorem; homotopy; manifolds; partitions of unity.
Prerequisites: MA 670 [Min Grade: B]

MA 675. Differential Geometry. 3 Hours.
Local and global theory of curves and surfaces; Fenchel s theorem; the first and second fundamental forms; surface area; Bernstein s theorem; Gauss theorema egregium; local intrinsic geometry of surfaces; Riemannian surfaces; Lie derivatives; covariant differentiation; geodesics; the Reimanncurvature tensor; the second variation of arc length; selected topics in the global theory of surfaces.
Prerequisites: MA 642 [Min Grade: C]

MA 685. Probability Theory. 3 Hours.
Combinatorics, probability spaces, conditional probabilities and independence, Bayes rule, discrete and continuous distributions, mean value and variance, moment generation function, joint distributions, correlation, Law of Large Numbers, Central Limit Theorem, random walks, Poisson process.

MA 687. Advanced Probability. 3 Hours.
Probability space, random variables, expected value, variance, joint distribution of a sequence of random variables, weak and strong Law of Large Numbers, Fourier transform of a distribution, Central Limit Theorem, elements of Martingale Theory.
Prerequisites: (MA 585 [Min Grade: C] or MA 685 [Min Grade: C]) and MA 646 [Min Grade: B]

MA 688. Advanced Statistics. 3 Hours.
Parameter estimations, Maximum likelihood estimation, Sufficient statistic, Rao-Cramer bound, Hypothesis testing, Neyman-Pearson Lemma, p-value, Regression, Order statistics, Nonparametric methods: Wilcoxon test, Run test, and Kolmogorov-Smirnov test, Anderson-Darling test, P-P plot, Q-Q plot, testing for distribution type, location and scale parameters, mean squared error.
Prerequisites: MA 585 [Min Grade: C] or MA 586 [Min Grade: C] or MA 587 [Min Grade: C] or MA 685 [Min Grade: C] or MA 687 [Min Grade: C]

MA 690. Mathematics Seminar. 1-3 Hour.
This course covers special topics in mathematics and the applications of the mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 691. Mathematics Seminar. 1-3 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 692. Special Topics in Mathematics. 1-3 Hour.
This course covers special topics in mathematics and the applications of the mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 693. Special Topics in Mathematics. 1-3 Hour.
This course covers special topics in mathematics and the applications of the mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 694. Special Topics in Mathematics. 1-6 Hour.
This course covers special topics in mathematics and the applications of the mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 695. Special Topics in Mathematics. 1-6 Hour.
This course covers special topics in mathematics and the applications of the mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 696. Special Topics in Mathematics. 1-12 Hour.
This course covers special topics in mathematics and the applications of the mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 697. Special Topics in Mathematics. 1-12 Hour.
This course covers special topics in mathematics and the applications of the mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 698. M Lev Non-Thesis Res. 1-12 Hour.
This course covers special topics in mathematics and the applications of the mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 699. Research for Thesis. 1-12 Hour.
This course covers special topics in mathematics and the applications of the mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.
Prerequisites: GAC M

MA 740. Advanced Complex Analysis. 3 Hours.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites: Having passed the Qualifying Exam or permission of instructor.

MA 745. Functional Analysis I. 3 Hours.
Normed and Banach spaces; inner product and Hilbert spaces; linear functionals and dual spaces; operators in Hilbert spaces; theory of unbounded sesquilinear forms; Hahn-Banach, open mapping and closed graph theorems; spectral theory.
Prerequisites: MA 646 [Min Grade: B]

MA 746. Functional Analysis II. 3 Hours.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 747. Linear Operators in Hilbert Space. 3 Hours.
Hilbert space; Bessel's inequality; Parseval's formula; bounded and un-bounded linear operators; representation theorems; the Friedrichs extension; the spectral theorem for self-adjoint operators; spectral theory for Schrodinger operators.
Prerequisites: MA 646 [Min Grade: B]

MA 748. Fourier Transforms. 3 Hours.
Lp spaces, Real and complex interpolation, Fourier Transform and applications. Singular integrals and Littlewood-Paley theory. Method of stationary phase, Strichartz estimates. Applications to the heat equation, the Schroedinger equation.
Prerequisites: MA 645 [Min Grade: B] and MA 648 [Min Grade: B] and MA 655 [Min Grade: B]

MA 749. Theory of Distribution. 3 Hours.
The space of test functions. The space of distributions. Main properties of distributions. Completeness of the space of distributions. Support of a distribution. Sochotzki formula. Derivatives of distributions and their properties. The structure of a distribution with a point support. Direct products and convolutions of distributions and their properties. Regularization of distributions. The space of test functions of rapid decay. The space of distributions of slow growth and their properties. Fourier transform of test functions of rapid decay and its properties. Parseval's identity. Fourier transform of distributions of slow growth. Fourier transform of direct products and convolutions of distributions of slow growth. Applications of distributions to partial differential equations. Fundamental solutions of partial differential equations.
Prerequisites: MA 645 [Min Grade: B]

MA 750. Advanced Ordinary Differential Equations. 3 Hours.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 753. Nonlinear Analysis. 3 Hours.
Selected topics including degree theory, bifurcation theory, and topological methods.

MA 755. Advanced Partial Differential Equations. 3 Hours.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.
Prerequisites: MA 645 [Min Grade: B]

MA 760. Dynamical Systems I. 3 Hours.
Continuous dynamical systems; limit sets; centers of attraction; recurrence; stable and wandering points; flow boxes, and monotone sequences in planar dynamical systems; Poincare-Bendixson theorem.

MA 761. Dynamical Systems II. 3 Hours.
Discrete dynamical systems; hyperbolicity; symbolic dynamics; chaos; homoclinic orbits; bifurcations; attractors(theory and examples).

MA 770. Continuum Theory. 3 Hours.
Pathology of compact connected metric spaces; inverse limits; boundary bumping theorem; Hahn-Muzukiewicz theorem; composants; chainable and circle-like continua; irreducibility; separation; unicoherence; indecomposability.

MA 772. Complex Analytic Dynamics. 3 Hours.
Riemann surfaces; polynomial dynamics, rational functions and entire functions; fixed point theory; Mandelbrot set; Julia sets; prime ends; conformal mappings.

MA 774. Algebraic Topology. 3 Hours.
Covering spaces; introduction to homotopy theory; singular homology, cohomology.

MA 776. Advanced Differential Geometry. 3 Hours.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 781. Differential Topology I. 3 Hours.
A study of differentiable structures on manifolds, primarily from a global viewport: smooth mappings including diffeomorphisms, immersions and submersions; submanifolds and transversality.
Prerequisites: MA 645 [Min Grade: B] and MA 675 [Min Grade: B]

MA 782. Differential Topology II. 3 Hours.
A continuation of MA 781, with further applications such as Morse Theory.

MA 790. Mathematics Seminar. 1-3 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 791. Mathematics Seminar. 1-3 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 792. Special Topics in Mathematics. 1-3 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 793. Special Topics in Mathematics. 1-3 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 794. Special Topics in Mathematics. 1-6 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 795. Special Topics in Mathematics. 1-6 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 796. Special Topics in Mathematics. 1-12 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 797. Special Topics in Mathematics. 1-12 Hour.
This course covers special topics in mathematics and the applications of mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 798. Non-Dissertation Research and Preparation for Comp. 1-12 Hour.
This course covers special topics in mathematics and the applications of the mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.

MA 799. Dissertation Research. 1-12 Hour.
This course covers special topics in mathematics and the applications of the mathematics. May be repeated for credit when topics vary. Prerequisites vary with topics.
Prerequisites: GAC Z

Physics

To obtain specific admissions requirements on how to apply to Graduate School, prospective students should visit this page: https://www.uab.edu/cas/physics/graduate

Degree Offered:	Ph.D., M.S.
Director:	Aaron Catledge, Ph.D.
Phone:	(205) 934-3693
E-mail:	catledge@uab.edu
Website:	http://www.uab.edu/cas/physics/graduate

Program Information

Students in the M.S. and Ph.D. programs may specialize in any of the areas of interest to the faculty, including experimental physics and theoretical and computational physics.

Admission

Admission into the physics graduate program is by recommendation of the graduate admission committee of the Department of Physics. The committee takes into consideration prior academic performance, personal statement, prior research experiences, GRE General Test scores (optional), and the letters of evaluation, usually from former instructors and research supervisors.

Beginning the Program

All students must take a placement examination on basic physics concepts before registering for any courses. Upon arrival at UAB, international students may be required to take English as a Second Language course or Scientific Communication courses at UAB during their first year of study.

Web http://www.uab.edu/cas/physics/graduate

M.S. Program

Plan I

The student must successfully complete at least 30 semester hours of coursework, including at least four core courses selected from PH 635**,** PH 650, PH 660, and PH 671 and 6 semester hours of Thesis Research PH 699. Equivalent directed reading course or courses may be substituted if approved by the graduate faculty. In addition, all students must complete the appropriate Responsible Conduct in Research Training before being admitted to candidacy. The student must also write and complete a successful oral defense of a thesis under the direction of a graduate faculty member. Additional coursework should

be selected with the advice of the student's graduate study committee to meet the particular needs of the student.

A detailed timeline for admission to candidacy and the appropriate forms for Plan I students may be found at the Graduate School website.

Deadlines for the Application for Degree and appropriate forms may be found here.

Additional general information about the steps to a degree and graduate school requirements may be found here.

Plan II

With approval of the physics graduate program director, a non-thesis option (Plan II) is available for all tracks in the Masters program. In this case, the graduate study committee requires the same total credit hours as for Plan I, but does not require 6 semester hours of Thesis Research (PH 699). The committee gives the student an M.S.-degree exit examination upon successful completion of the coursework.

Deadlines for Application for Degree and appropriate forms may be found at the Graduate School website.

M.S. Concentrations

M.S. Program in Physics Plan I (30 credit hours total)

Students have the option to choose from among three M.S. concentrations: (1) Concentration in Optics & Photonics, (2) Concentration in Materials Physics, or (3) Concentration in Computational Physics.

All entrants must have at least one semester of PH 445 (Electromagnetic Theory I), PH 450 (Introductory Quantum Mechanics I), and PH 432 (Statistical Thermodynamics I) or equivalent.

The following are requirements for the MS Concentrations*:

- Participation every semester in Physics Seminar (1 credit hour/ semester); PH 791 (Physics Seminar I) in Fall and PH 792 (Physics Seminar II) in Spring
- For students on teaching assistantships, the following course must be taken: PH 590 (Preparations for Teaching).

* Note: Up to 6 credit hours are allowed for PH 698 (Non-Thesis Research) to satisfy the MS credit hours requirement, with approval of graduate committee.

Required Core Courses

Requirements		Hours
PH 671	Quantum Mechanics I	3
PH 660	Methods of Mathematical Physics	3
PH 793	Scientific Communications I	1
PH 794	Scientific Communications II	1
PH 699	Research for Thesis	6
Total Hours		**14**

Concentration in Optics & Photonics

Requirements		Hours
Required Courses		**6**
PH 525	Applications of Contemporary Optics I	
PH 581	Laser Physics I	
PH Elective Courses		**6**
PH 582	Laser Physics II	
PH 752	Light-Matter Interactions	
PH 653	Solid State Physics I	
Non-PH Elective Courses		
(if needed to satisfy M.S. credit hours requirement)		
BME 665	Computational Vision	
PH 497	Special Topics in Physics	
GBSC 714	Applications of Microscopy	
EE 623	Computer Vision	
Total Hours		**12**

Concentration in Materials Physics

Requirements		Hours
Required Courses		**6**
PH 551	Introductory Quantum Mechanics II	
PH 653	Solid State Physics I	
PH 635	Advanced Statistical Mechanics	
PH Elective Courses		**6**
PH 587	Nanoscale Science and Applications	
PH 635	Advanced Statistical Mechanics	
PH 518	Machine Learning Applications in Physics and Materials Science	
PH 653	Solid State Physics I	
PH 654	Solid State Physics II	
PH 655	Advanced Solid State Laboratory	
PH 551	Introductory Quantum Mechanics II	
Non-PH Elective Courses		
(if needed to satisfy M.S. credit hours requirement)		
MSE 513	Composite Materials	
MSE 565	Characterization of Materials	
MSE 565L	Characterization of Materials Laboratory	
MSE 602	Intro to Thermodynamics and Mechanics of Materials	
MSE 530	Polymeric Materials	
MSE 530L	Polymeric Materials Lab	
MSE 564	Metals and Alloys	
MSE 570	Ceramic Materials	
MSE 570L	Ceramic Materials Laboratory	
GBSC 714	Applications of Microscopy	
MSE 501	Materials Processing	
Total Hours		**12**

Concentration in Computational Physics

Requirements		Hours
Required Courses		**6**
PH 762	Computational Physics I	
PH 518	Machine Learning Applications in Physics and Materials Science	
PH Elective Courses		**6**
PH 635	Advanced Statistical Mechanics	
PH 650	Electromagnetic Theory I	
PH 551	Introductory Quantum Mechanics II	
PH 653	Solid State Physics I	
Non-PH Elective Courses		
(if needed to satisfy M.S. credit hours requirement)		
MA 560	Scientific Programming	

MA 566	Introduction to Optimization	
MA 660	Numerical Linear Algebra	
CS 663	Data Mining	
CS 667	Machine Learning	
CS 665	Deep Learning	
CS 685	Foundations of Data Science	
Total Hours		**12**

Ph.D. Program

All students are required to take the following core courses:

PH 760 Methods of Mathematical Physics I (3 CH, 1 semester)

PH 715 Advanced Statistical Mechanics (3 CH, 1 semester)

PH 750 Classical Electrodynamics I (3 CH, 1 semester)

PH 771 Quantum Mechanics I (3 CH, 1 semester)

PH 793-PH 794 Scientific Communications I, II 2 credit hours

In addition, GRD717, Responsible Conduct in Research, must be taken prior to admission to candidacy. Students are encouraged to take the course during their first summer semester in the PhD program.

A qualifying examination is given to test a student's competency in fundamental areas of Physics. This examination is divided into three sections: statistical mechanics, electromagnetic theory, and quantum physics. Each exam must be taken at the first offering following the completion of the related core course, PH 715, PH 750, and PH 771. PH 760 should be passed before any of the qualifying exams. The examination may not be taken more than twice. Scientific communications, PH 793 and PH 794, must be taken at the first offering following the completion of the qualifying examinations.

Following satisfactory completion of the core qualifying examinations and consultation with individual faculty members, the student selects a specific area for dissertation research under the supervision of an appropriate graduate faculty member. The student's Graduate Study Committee, chaired by the major advisor, will outline a program of study including graduate courses and appropriate tools of research, such as computer and/or foreign language competency. Also, the Graduate Study Committee will administer an oral selected topic examination to test the student's knowledge in the area of research. The student must pass this oral examination in no more than two attempts. Then, with direction from the major advisor, the student should focus on formulating and writing a formal research proposal that must be presented and defended before the Graduate Study Committee; this should lead to a recommendation from the committee for admission to candidacy. Dissertation research culminates in the successful oral defense of the dissertation.

A detailed timeline for admission to candidacy and the appropriate forms for Plan I students may be found at the Graduate School website.

Deadlines for the Application for Degree and appropriate forms may be found here.

Additional general information regarding steps to the degree and graduate school requirements may be found here.

The Physics Graduate program offers two tracks, the Physics Track and the Applied Physics Track.

Physics Track:

For students entering with a B.S. degree, the program requires a total of 72 credit hours distributed as follows:

- Fourteen semester hours of the core courses listed above
- PH 752 Light-Matter Interactions (3 credit hours)
- GRD 717 (3 credit hours)
- Three credit hours of elective courses approved by dissertation committee and/or graduate program director
- Participation every semester in Physics Seminar (1 credit hour/ semester); PH 791 Physics Seminar I (Fall) and PH 792 Physics Seminar II (Spring).
- Directed and Dissertation Research (at least 2 semesters of dissertation research are required to graduate)

For information about transferring credits from a Masters of Science program, please contact the department (mezvanut@uab.edu).

Applied Physics Track:

For students entering with a B.S. degree, the program requires a total of 72 credit hours distributed as follows:

- Fourteen semester hours of the core courses listed above
- PH 746 Applied Physics Internship (3 credit hours)
- GRD 717 (3 credit hours)
- Participation every semester in Physics Seminar (1 credit hour/ semester); PH 791 Physics Seminar I (Fall) and PH 792 Physics Seminar II (Spring).
- Three credit hours of elective courses approved by dissertation committee and/or graduate program director
- Directed and Dissertation Research (at least 2 semesters of dissertation research are required to graduate

For information about transferring credits from a Masters of Science program, please contact the department (mezvanut@uab.edu)

The following is a partial list of elective courses. Others may be suggested by the student or advisor. All electives must be approved by the graduate advisor and/or PhD committee.

Elective Courses for the Applied Physics Track

- PHY 792: Cell Interactions with Biomaterials. 3 credit hours
- PH 753-754: Advanced Solid State Physics. 6 credit hours
- MSE 743-744: Materials Characterization I and II. 6 credit hours
- PH 732-733: Growth and Characterization of Thin Films I, II. 6 credit hours
- BME 590: Tissue Engineering. 3 credit hours
- PH 587: Nanoscale Science and Applications. 3 credit hours
- PH 575-576: Introduction to Biophysics I, II. 6 credit hours
- PH 581-582: Laser Physics I, II. 6 credit hours
- PH 585: Laser Spectroscopy. 3 credit hours
- PH 525-526: Applications of Contemporary Optics I, II. 6 credit hours

The following doctoral fellowships are available to the graduate students enrolled in the PhD program in physics at UAB.

Blazer Graduate Research Fellowship in Physics

Applicants to the PhD program in Physics, who have demonstrated exceptional promise in research and scholarship, will be considered for the UAB Blazer Fellowship*. Fellowship recipients will receive a fellowship stipend as well as tuition and health insurance. Furthermore, they will be able to engage in research at the beginning of their first year with no teaching duties. It is expected that the Blazer Fellow will be able to commence PhD research and choose a research mentor by the end of their first year.*

For information about the application, contact the Physics Graduate Program director at catledge@uab.edu.

NASA-Alabama Space Grant Consortium Fellowships

Awards are up to $37,000 ($24K in student stipend, up to $12K for tuition/ insurance and $1K for student travel allowance) and are made initially for one 12-month period and may be renewed annually for a maximum total award of 36 months (3 years) support. Must be a U.S. citizen, enrolled full-time in good academic standing with a GPA of at least 3.0 on a 4.0 scale at an Alabama Space Grant member university pursing any space-related field of graduate study (Masters or Doctoral level). Must conduct a specific faculty-mentored research project that has a NASA or aerospace relevance. Cannot receive funds from any source for work other than that defined by the student's approved proposed research and plan of study for which the award is made (supplements to the student's award may be made by the home university using funds from any source, provided the amount and source are disclosed in advance - see information booklet for more details). Awardees must also complete an extramural NASA experience sometime during the fellowship year. The details are to be worked out with the faculty advisor and NASA lab facility where the student plans to participate in a research activity. *It is advisable that a NASA contact be found prior to submission of the fellowship proposal.* Fellows are also expected to be involved in ASGC outreach activities and submit a final report at the end of the award period.

The online Graduate Fellowship Application is available through the department website.

Graduate Research Scholars Program

Graduate students working toward their PhD may compete for a research fellowship based on the quality of their present research and promise of future success through the the Graduate Research Scholars Program (GRSP). The GRSP is designed to strengthen and enhance the research capacity of member institutions of the Alabama Experimental Program to Stimulate Competitive Research (EPSCoR). Students submit a complete research proposal package to the UAB EPSCoR Coordinator in Spring each year, and successful recipients are announced in early Summer.

For up-to-date information about additional fellowships, please contact the Physics Graduate Program Director, catledge@uab.edu.

Additional Information

Deadline for Entry Term(s):	Each Fall semester
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins
Number of Evaluation Forms Required:	Three
Entrance Tests:	TOEFL and TWE required for international applicants whose native language is not English.
Comments:	GRE General Test is optional

Courses

PH 502. Instructional Physical Science. 4 Hours.
Modern Physics for Teachers.

PH 502L. Instructional Physical Science Laboratory. 0 Hours.
Design of Physical Science Labs and Detailed Instructional Plans.

PH 505. Studies in Physics Teaching II. 3 Hours.
Development of new curricula, apparatus, and techniques of presentation of concepts in physics. Prerequisite: Permission of instructor.

PH 507. Physical Science for Teachers I. 3 Hours.
Concepts of physical science. Laboratory includes evaluation of experiments and equipment for lecture demonstrations. Prerequisite: Permission of instructor.

PH 508. Physical Science for Teachers II. 3 Hours.
Concepts of physical science. Laboratory includes evaluation of experiments and equipment for lecture demonstrations. Prerequisite: Permission of instructor.

PH 510. Physics of Fluids and Polymer Solutions. 3 Hours.
This course provides an overview of fluid mechanics and polymer physics appropriate for physics, engineering, chemistry, and biology majors. Topics include the concept of a fluid, the fluid as a continuum, properties of the velocity field, thermodynamic properties of a fluid, viscosity, pressure distribution in a fluid, basic physical laws of fluid mechanics, the Reynolds transport theorem, differential relations for a fluid particle, viscous flow, polymer solutions and thermodynamics, Brownian motion, diffusion equation, Fick's law, Stokes-Einstein equation and hydrodynamic radius of a polymer chain, and viscosity of polymer solutions.
Prerequisites: PH 221 [Min Grade: C] and MA 252 [Min Grade: C]

PH 518. Machine Learning Applications in Physics and Materials Science. 3 Hours.
This course covers interdisciplinary topics in material physics, computer science, and data science, with a focus on introducing first-principles software based on density-functional theory and data-driven machine-learning discoveries for applications in materials science and other physics domains.

PH 520. Introduction to Methods in Theoretical Physics I. 3 Hours.
Vector calculus. Curvilinear coordinate systems; commonly encountered ordinary differential equations and special functions; complex variables and contour integration partial differential equations, including solutions by Green function methods. Prerequisite: Permission of instructor.
Prerequisites: PH 222 [Min Grade: C] and MA 252 [Min Grade: C]

PH 524. Biomedical Optics. 3 Hours.
The objective of this class is to present an overview of applied optics, with an emphasis on biomedical optics.
Prerequisites: PH 222 [Min Grade: C]

PH 525. Applications of Contemporary Optics I. 3 Hours.
Applied geometrical optics. Refraction and reflection, paraxial optics, thick lens, matrix theory, optical aberrations, optical systems, and optical design using computer simulations.
Prerequisites: PH 222 [Min Grade: C]

PH 526. Applications of Contemporary Optics II. 3 Hours.
Applied wave optics. Fresnel equations, optical interference, optical interferometry, coherence, diffraction, lasers, and Gaussian beam propagation.
Prerequisites: PH 525 [Min Grade: C]

PH 527. Geometrical Optics. 4 Hours.
Properties of optical systems. Lenses, mirrors, and stops; aberrations; rays and wave fronts, optical instruments; aspheric components.
Prerequisites: PH 222 [Min Grade: C]

PH 527L. Geometrical Optics Lab. 0 Hours.
Geometrical Optics Lab.

PH 528. Physical Optics. 4 Hours.
Interference and diffraction phenomena; emission, propagation, and absorption of radiation; polarization and dispersion; stimulated emission.
Prerequisites: PH 527 [Min Grade: C]

PH 528L. Physical Optics Lab. 0 Hours.
Physical Optics Lab.

PH 529. Applications of Contemporary Optics III. 3 Hours.
Applied optical interactions with materials linear and nonlinear polarization phenomena, optical properties of materials, anisotropic optics, electro-optics, and nonlinear optics.
Prerequisites: PH 526 [Min Grade: C]

PH 532. Statistical Thermodynamics I. 3 Hours.
Statistical basis of laws of thermodynamics; ensembles and partition functions; quantum statistics of ideal gases, including photons and electrons; applications to solids, real gases, liquids, and magnetic systems; transport theory.
Prerequisites: PH 351 [Min Grade: C]

PH 533. Statistical Thermodynamics II. 3 Hours.
Statistical basis of laws of thermodynamics; ensembles and partition functions; quantum statistics of ideal gases, including photons and electrons; applications to solids, real gases, liquids, and magnetic systems; transport theory.
Prerequisites: PH 532 [Min Grade: C]

PH 545. Electromagnetic Theory I. 3 Hours.
Electromagnetic theory approached from standpoint of fields and using Maxwell's equations.
Prerequisites: PH 420 [Min Grade: C] or MA 444 [Min Grade: C]

PH 546. Electromagnetic Theory II. 3 Hours.
Electromagnetic theory approached from standpoint of fields and using Maxwell's equations.
Prerequisites: PH 545 [Min Grade: C]

PH 550. Introduction to Quantum Mechanics I. 3 Hours.
Principles of quantum mechanics; their application to particle waves, angular momentum, tunneling, radiation, and selection rules; perturbation and variational methods.
Prerequisites: PH 351 [Min Grade: C] and PH 562 [Min Grade: C]

PH 551. Introductory Quantum Mechanics II. 3 Hours.
Principles of quantum mechanics; their application to particle waves, angular momentum, tunneling, radiation, and selection rules; perturbation and variational methods.
Prerequisites: PH 550 [Min Grade: C]

PH 552. Introduction to Quantum Mechanics III. 2 Hours.

PH 553. Solid State Physics I. 3 Hours.
Properties of crystal lattices, lattice dynamics, lattice imperfections, and bonding energies; electronic properties of dielectrics, semiconductors, and metals; ferroelectric, magnetic, and optical properties of solids.
Prerequisites: PH 551 [Min Grade: C]

PH 554. Solid State Physics II. 3 Hours.
Properties of crystal lattices, lattice dynamics, lattice imperfections, and bonding energies; electronic properties of dielectrics, semiconductors, and metals; ferroelectric, magnetic, and optical properties of solids.
Prerequisites: PH 553 [Min Grade: C]

PH 557. Directed Reading in Quantum Physics. 3 Hours.
Tutorial studies in quantum physics offered by special arrangement.
Prerequisites: PH 351 [Min Grade: C] and PH 562 [Min Grade: C]

PH 558. Directed Reading in Physics. 3 Hours.
Directed Reading in Physics I. Tutorial studies in physics offered by special arrangement.

PH 561. Classical Mechanics I. 3 Hours.
Kinematics and dynamics, including central forces, rotating coordinate systems, and generalized coordinates; Lagrangian and Hamiltonian.
Prerequisites: PH 222 [Min Grade: C] and MA 252 [Min Grade: C]

PH 562. Classical Mechanics II. 3 Hours.
Kinematics and dynamics, including central forces, rotating coordinate systems, and generalized coordinates; Lagrangian and Hamiltonian.
Prerequisites: PH 561 [Min Grade: C]

PH 571. Atomic and Molecular Physics. 3 Hours.
Applications of quantum mechanics to structure and spectra of atoms and small molecules; use of symmetry in understanding and describing molecular vibrations and bonding.
Prerequisites: PH 551 [Min Grade: C]

PH 575. Intro to Biophysics I. 3 Hours.
Application of physical techniques and analytical methods of selected biological problems. Permission of instructor.
Prerequisites: PH 352 [Min Grade: C]

PH 576. Intro to Biophysics II. 3 Hours.
Application of physical techniques and analytical methods of selected biological problems. Permission of instructor.
Prerequisites: PH 575 [Min Grade: C]

PH 580. Directed Reading in Classical Physics. 3 Hours.
Tutorial studies in classical physics offered by special arrangement.
Prerequisites: PH 222 [Min Grade: C] and MA 252 [Min Grade: C]

PH 581. Laser Physics I. 3 Hours.
Physical principles of laser operation and design. Spontaneous and stimulated emission, population inversion, light amplification, laser resonators, Q-switching, mode-locking, pulse shortening techniques, spectral narrowing, and tunable lasers. Individual types of lasers will be considered. Practical applications of lasers will be treated in detail.
Prerequisites: PH 222 [Min Grade: C]

PH 582. Laser Physics II. 3 Hours.
Physical principles of laser operation and design. Spontaneous and stimulated emission, population inversion, light amplification, laser resonators, Q-switching, mode-locking, pulse shortening techniques, spectral narrowing, and tunable lasers. Individual types of lasers will be considered. Practical applications of lasers will be treated in detail.
Prerequisites: PH 581 [Min Grade: C]

PH 583. Atomic and Nuclear Physics. 3 Hours.
Prerequisites: PH 352 [Min Grade: C]

PH 584. Atomic and Nuclear Physics. 3 Hours.
Prerequisites: PH 583 [Min Grade: C]

PH 585. Laser Spectroscopy. 3 Hours.
Practical applications of lasers and modern techniques and instrumentation in laser spectroscopy.
Prerequisites: PH 222 [Min Grade: D]

PH 586. Semiconductor Materials in Modern Technology. 3 Hours.
Brief review of electronic materials with emphasis on traditional and cutting edge Si technology. Competing and complementary semiconductors covered in standard lecture and seminar style. Materials: compound and tertiary semiconductors, organic semiconductors, wide bandgap semiconductors. Applications: optical and chemical sensors, microwave electronics, high power electronics, lasers. Specific applications/ materials determined by student interest.
Prerequisites: PH 352 [Min Grade: C] or EE 351 [Min Grade: C] or CH 326 [Min Grade: C]

PH 587. Nanoscale Science and Applications. 3 Hours.
Nanoscale Science and Applications. Physics of electronic, mechanical, and biological properties of materials at the nanoscale level approaching one billionth of a meter. The applications of nanoscale materials in electronic, mechanical, and biomedical systems will be emphasized. Special tools in synthesis and characterization of nanomaterials will be discussed.

PH 589. Applications of Modern Physics. 3 Hours.

PH 590. Preparations for Teaching. 1-3 Hour.
This class is intended to help teaching assistants prepare for successful teaching experiences. The course will emphasize a foundation of practical knowledge related to expectations and duites shared by teachers in higher education, as well as an opportunity to read, reflect, and discuss current research related to teaching and learning at the university level.

PH 591. Advanced Physics Laboratory I. 1-4 Hour.
Laboratory investigation of topics of modern physics. Permission of instructor.

PH 592. Advanced Physics Laboratory II. 1-4 Hour.
Laboratory investigation of topics of modern physics. Permission of instructor.

PH 593. Advanced Physics Laboratory III. 1-4 Hour.
Laboratory investigation of topics of modern physics. Permission of instructor.

PH 594. Computers in Physics. 3 Hours.

PH 595. Computers in Physics. 3 Hours.

PH 597. Special Topics in Physics. 1-3 Hour.

PH 610. Classical Mechanics I. 3 Hours.
Applications of methods of LaGrange, Hamilton, Poisson, and Hamilton-Jacobi to such classical problems as central force, small oscillation, and rigid body motions.
Prerequisites: PH 562 [Min Grade: C]

PH 618. Computational Solid State Physics. 3 Hours.
This course covers interdisciplinary topics in material physics, computer science, and data science, with a focus on introducing first-principles software based on density-functional theory and data-driven machine-learning discoveries for applications in materials science and other physics domains.

PH 635. Advanced Statistical Mechanics. 3 Hours.
Applications of statistical laws to modern topics such as quantum fluids, critical phenomena, and nonequilibrium systems.
Prerequisites: PH 551 [Min Grade: B]

PH 650. Electromagnetic Theory I. 3 Hours.
Boundary value and Green function methods for solving potential problems; fields in dielectric, magnetic media, and radiation fields.
Prerequisites: PH 546 [Min Grade: B]

PH 651. Electromagnetic Theory II. 3 Hours.
Boundary value and Green function methods for solving potential problems; fields in dielectric, magnetic media, and radiation fields.
Prerequisites: PH 650 [Min Grade: C]

PH 652. Electromagnetic Theory III. 3 Hours.
Electromagnetic Theory.

PH 653. Solid State Physics I. 3 Hours.
Structure and dynamics of solids; optical, magnetic, and transport properties.
Prerequisites: PH 551 [Min Grade: C]

PH 654. Solid State Physics II. 3 Hours.
Structure and dynamics of solids; optical, magnetic, and transport properties.
Prerequisites: PH 653 [Min Grade: C]

PH 655. Advanced Solid State Laboratory. 1-3 Hour.
Thin film X-ray diffraction, Raman spectroscopy in materials characterization, electron paramagnetic resonance, and thin film deposition.
Prerequisites: PH 653 [Min Grade: C] and PH 654 [Min Grade: C]

PH 660. Methods of Mathematical Physics. 3 Hours.
Vector and tensor analysis; differential and integral equations; Green functions; variational techniques; linear operator theory; Fourier and Laplace transforms.
Prerequisites: PH 520 [Min Grade: B]

PH 671. Quantum Mechanics I. 3 Hours.
Discrete and continuous spectra; central force problems; angular momentum and spin; systems of identical particles; perturbation theory; scattering theory.
Prerequisites: PH 546 [Min Grade: B] and PH 551 [Min Grade: B]

PH 672. Quantum Mechanics II. 3 Hours.
Discrete and continuous spectra; central force problems; angular momentum and spin; systems of identical particles; perturbation theory; scattering theory.
Prerequisites: PH 671 [Min Grade: C]

PH 673. Applications of Quantum Mechanics. 3 Hours.
Scattering theory, density matrix, and polarization; applications to atomic and nuclear reactions.
Prerequisites: PH 671 [Min Grade: C] and PH 672 [Min Grade: C]

PH 695. Directed Reading. 2-3 Hours.
Tutorial studies in physics offered by special arrangement. Permission of instructor.

PH 696. Directed Reading in Classical Physics. 3 Hours.
Tutorial studies in classical physics offered by special arrangement.
Prerequisites: PH 562 [Min Grade: C]

PH 697. Special Topics in Physics. 1-12 Hour.
Topics of current interest, such as theoretical physics, computational physics, experimental techniques. May be repeated for credit. 1-12 hours.

PH 698. Nonthesis Research. 1-12 Hour.
May be repeated for credit.

PH 699. Research for Thesis. 1-12 Hour.
May be repeated for credit. Prerequisite: Admission to candidacy. 1-12 hours.
Prerequisites: GAC M

PH 710. Advanced Classical Mechanics I. 3 Hours.
Analysis of dynamics, including rigid body motion, featuring the LaGrange formulation, introduction to the Hamiltonian, formulation, Poisson brackets, analyses in nonrelativistic applications.
Prerequisites: PH 562 [Min Grade: C]

PH 711. Advanced Classical Mechanics II. 3 Hours.
Analysis of dynamics, including rigid body motion, featuring the LaGrange formulation, introduction to the Hamiltonian, formulation, Poisson brackets, analyses in nonrelativistic applications.
Prerequisites: PH 710 [Min Grade: C]

PH 715. Advanced Statistical Mechanics. 3 Hours.
Applications of statistical laws to modern topics such as quantum fluids, critical phenomena, and nonequilibrium systems.
Prerequisites: PH 532 [Min Grade: B] and PH 551 [Min Grade: B]

PH 716. Advanced Statistical Mechanics. 3 Hours.
Applications of statistical laws to modern topics such as quantum fluids, critical phenomena, and nonequilibrium systems.
Prerequisites: PH 715 [Min Grade: C]

PH 718. Machine Learning Applications in Physics and Materials Science. 3 Hours.
This course covers interdisciplinary topics in material physics, computer science, and data science, with a focus on introducing first-principles software based on density-functional theory and data-driven machine-learning discoveries for applications in materials science and other physics domains.

PH 732. Growth and Characterization of Thin Films I. 3 Hours.
Basics of vacuum science. Methods of thin film deposition. Nucleation, evolution of microstructure and surface morphology of thin films. Simulation of growth processes. Thin film characterization techniques (SEM/SIM, TEM, SPM, SPS/AES, XRD, optical and and mechanical measurements). Demonstrations on thin-film deposition and basic characterization of tilm microstructure and properties. Prerequisites: PH 553/653 and PH554/654 or permission of instructor. Lecture and demonstration. 3 semester hours.
Prerequisites: (PH 453 [Min Grade: C] or PH 553 [Min Grade: C]) and (PH 454 [Min Grade: C] or PH 554 [Min Grade: C])

PH 733. Growth and Characterization of Thin Films II. 3 Hours.
Basics of vacuum science. Methods of thin film deposition. Nucleation, evolution of microstructure and surface morphology of thin films. Simulation of growth processes. Thin film characterization techniques (SEM/SIM, TEM, SPM, XPS/AES, XRD, optical and mechanical measurements). Demonstrations on thin-film deposition and basic characterization of film microstructure and properties. Prerequisites: PH553/653 and PH554/654 or permission of instructor. Lecture and demonstrations. 3 semester hours.
Prerequisites: (PH 453 [Min Grade: C] or PH 553 [Min Grade: C]) and (PH 454 [Min Grade: C] or PH 554 [Min Grade: C])

PH 745. Molecular Spectroscopy. 3 Hours.
Infrared, Raman, and ultraviolet techniques applied to study of molecular properties, including rotation-vibration spectra and spectra of crystalline solids.

PH 746. Applied Physics Internship. 3 Hours.
Practical research outside UAB or, upon approval of the graduate program director, at a UAB laboratory other than that of the student's advisor. The internship is intended to supplement proposed or ongoing dissertation research.

PH 747. Theoretical Nuclear Physics. 3 Hours.

PH 750. Classical Electrodynamics I. 3 Hours.
Static and time-varying fields in vacuum and in matter, radiation fields, solutions and implications of Maxwell's equation utilizing advanced mathematical methods.
Prerequisites: PH 546 [Min Grade: B] and PH 760 [Min Grade: B]

PH 751. Classical Electrodynamics II. 3 Hours.
Static and time-varying fields in vacuum and in matter, radiation fields, solutions and implications of Maxwell's equation utilizing advanced mathematical methods.
Prerequisites: PH 750 [Min Grade: C]

PH 752. Light-Matter Interactions. 3 Hours.
Quantized Electromagnetic Fields; Photons; Quantum Optics; Coherence; Nonlinear optics; Quantum excitations in solids.
Prerequisites: PH 750 [Min Grade: B] and PH 771 [Min Grade: B]

PH 753. Solid State Physics I. 3 Hours.
Properties of electrons and photons in crystal lattices; electromagnetic interactions with solids; lattice defects.

PH 754. Solid State Physics II. 3 Hours.
Properties of electrons and photons in crystal lattices; electromagnetic interactions with solids; lattice defects.
Prerequisites: PH 753 [Min Grade: C]

PH 755. Advanced Solid State Physics III. 2 Hours.
Advanced Solid State Physics II.
Prerequisites: PH 753 [Min Grade: C] and PH 754 [Min Grade: C]

PH 760. Methods of Mathematical Physics I. 3 Hours.
Vector and tensor analysis; differential and integral equations; Green functions; variational techniques; linear operator theory; Fourier and Laplace transforms.
Prerequisites: PH 520 [Min Grade: B]

PH 761. Methods of Mathematical Physics II. 3 Hours.
Vector and tensor analysis; differential and integral equations; Green functions; variational techniques; linear operator theory; Fourier and Laplace transforms.

PH 762. Computational Physics I. 3 Hours.
Numerical techniques for solution of differential, integral, and matrix equations of physics; computer simulations of physical phenomena; optimization problems.
Prerequisites: PH 545 [Min Grade: C] and PH 551 [Min Grade: C] and PH 561 [Min Grade: C]

PH 771. Quantum Mechanics I. 3 Hours.
Discrete and continuous spectra; central force problems; angular momentum and spin; systems of identical particles; perturbation theory; scattering theory.
Prerequisites: PH 546 [Min Grade: B] and PH 551 [Min Grade: B]

PH 772. Quantum Mechanics II. 3 Hours.
Discrete and continuous spectra; central force problems; angular momentum and spin; systems of identical particles; perturbation theory; scattering theory.
Prerequisites: PH 771 [Min Grade: C]

PH 773. Applications of Quantum Mechanics. 3 Hours.
Scattering theory, density matrix, and polarization; applications to atomic and nuclear reactions.
Prerequisites: PH 771 [Min Grade: C] and PH 772 [Min Grade: C]

PH 791. Physics Seminar I. 1 Hour.
Topics of current interest in physics, presented by graduate students, faculty, and visitors. Required each term of all full-time graduate students.

PH 792. Physics Seminar II. 1 Hour.
Topics of current interest in physics, presented by graduate students, faculty, and visitors. Required each term of all full-time graduate students.

PH 793. Scientific Communications I. 1 Hour.
Scientific writing exercises and recent topics in physics presented by graduate students in order to provide experience in written and oral scientific communication.

PH 794. Scientific Communications II. 1 Hour.
Scientific writing exercises and recent topics in physics presented by graduate students in order to provide experience in written and oral scientific communication.
Prerequisites: PH 793 [Min Grade: C]

PH 795. Directed Reading. 2-3 Hours.
Tutorial studies in physics offered by special arrangement. Permission of instructor.

PH 797. Special Topics in Physics. 1-12 Hour.
Topics of current interest, such as group theory, medical physics, computational methods, biological physics, materials physics, optics, and space physics. May be repeated for credit.

PH 798. Non-Dissertation Research. 1-12 Hour.
Permission of instructor.

PH 799. Research for Dissertation. 1-12 Hour.
Admission to candidacy.
Prerequisites: GAC Z

Political Science and Public Administration

Chair: Robert Blanton, Ph.D.

The Department of Political Science and Public Administration offers a graduate program of study leading to the Master of Public Administration (MPA) degree.

UAB's nationally ranked MPA Program is accredited by the Network of Schools of Public Policy, Affairs, and Administration (NASPAA). Our MPA Program prepares students for successful careers in public service where they can serve the greater good. We have graduates locally and across the country who have become successful leaders and managers in local, state, and federal government positions, and in nonprofit organizations.

Degree Offered:	MPA
Director:	Erin L. Borry, Ph.D.
Phone:	(205) 996-2159
E-mail:	borry@uab.edu
Website:	http://www.uab.edu/mpa

MPA Program

The MPA Program prepares individuals for positions of leadership in the public and nonprofit sectors. It is a professional graduate degree for both pre-career students and in-service administrators. The Program is designed to develop the insights and skills needed to plan and formulate policy, and to organize, manage, and implement programs and operations. The MPA Program is accredited by the Network of Schools of Public Policy, Affairs, and Administration (**NASPAA**). Its Board of Advisors consists of internal and external stakeholders comprised of community members, alumni and students.

The MPA curriculum is designed to ensure that students achieve competency in five domains:

- to lead and manage in the public interest;
- to participate in, and contribute to, the policy process;
- to analyze, synthesize, think critically, solve problems and make evidence-informed decisions in a complex and dynamic environment;
- to articulate, apply, and advance a public service perspective;
- to communicate and interact productively and in culturally responsive ways with a diverse and changing workforce and society at large.

MPA Program Mission

The UAB MPA Program is committed to excellence in graduate education through teaching, research, service, and practice. Through a knowledge- and skills-based curriculum informed by public values, the Program focuses on building the next generation of ethical, inclusive, and responsive decisionmakers who advance the public interest.

Degree Requirements

The MPA Degree requires a total of 39 semester hours; pre-career students must complete an additional three (3) hours of internship (20 hours/week), for a total of 42 hours. Students must maintain a minimum 3.0 grade point average (GPA) and in accordance with the MPA Program Grade Policy. Students without professional public service experience are required to do a three-hour internship in addition to required coursework. Previous graduate work at UAB or another NASPAA-accredited MPA Program may be credited toward the degree if it is directly applicable. Students may select the thesis option or the non-thesis option.

Grade Policies

Graduate School Policy

Students must maintain a 3.0 grade point average (GPA) throughout the duration of the Program in accordance with Graduate School policies. If students fail to maintain a cumulative GPA of 3.0 for any semester, they will receive a warning letter via email from the Graduate School. If the GPA remains below 3.0 for two (2) consecutive semesters, the student will receive a notification email from the Graduate School and be placed on academic probation. Students on probation must then make a 3.0 or better semester average for each succeeding semester that their overall cumulative average is below 3.0. Students are removed from probation when their cumulative average is 3.0 or above. If they make below a 3.0 average while on probation, they are dismissed. When students repeat a course, the last grade will be utilized to calculate their cumulative GPA.

Program Policy

In addition to complying with the Graduate School policy, students must earn B or better in at least seven (7) of the eight (8) core MPA courses. Upon receiving the first grade of a C in any core course, a student will be placed on probation in the Program. A student who makes a second grade of C or below in any core course is subject to dismissal from the Program, regardless of the overall GPA. After receiving a second C,

a student may retake either of those two courses, in accordance with Graduate School guidelines, and must do so the next semester. If the student earns a grade of B or better during the retaken course, they must file a grade replacement application with the Graduate School. If that application is approved, they will be allowed to continue their coursework and remain in the Program. Please note: a grade of F given for academic misconduct is not eligible for replacement.

Admission Requirements

Because of its multidisciplinary nature, persons from all undergraduate majors are considered for admission to the MPA Program. The MPA Program accepts applications for fall, spring, and summer admissions (international applicants are accepted fall and spring semesters only). All applications must be made online by visiting the UAB Graduate School website.

Applications for the MPA Program must include:

- Undergraduate transcripts (and, if applicable, graduate transcripts);
- Statement of interest that addresses this prompt:
  - In 1-2 single-spaced pages (300-600 words), please share why the MPA degree at UAB is right for you. Address your public service values and motivations, ways you want to make change, and vision for your career after obtaining your MPA degree. If you have prior academic deficiencies, please also address those in this statement; and
- Two (2) letters of recommendation that meet the below criteria:
  - If possible, both letters should come from academic references (which may include professors and faculty advisors) and account for your academic performance and commitment. If one or both letters are not from academic references, they must be professional references. These letters must come from someone who was in a supervisory position in which you were their subordinate in either a work or volunteer capacity. They need to list in what capacity they know you (employee, subordinate, volunteer, etc.). Letters from peers, co-workers, friends, etc. are not acceptable.

An ideal candidate for the MPA Program has an undergraduate and/or graduate GPA of around 3.0, strong letters of reference, and a statement of interest that strongly reflects a desire to serve the public interest.

Deadline for Entry Term(s):	Each semester
Deadline for All Application Materials to be in the Graduate School Office:	Fall: August 1, Spring: December 1; Summer: April 1
Number of Reference Letters Required:	Two

Financial Aid

The Department of Political Science and Public Administration has a limited number of graduate assistantships awarded on a competitive basis, which can be awarded during any semester as vacancies occur. The Department has two scholarships which are awarded on a competitive basis each spring. Other financial resources are available through the Office of Student Financial Aid.

Internships and Placement

Students may apply for an internship placement at any time. A few paid opportunities do arise, although the majority of internships are non-paid. Typical placements are in city and county government, planning departments, public health agencies, social service agencies, state government agencies, and various nonprofit organizations. The Department has placed several students in the prestigious Presidential Management Fellowship (PMF) Program, which provides an excellent opportunity for eventual employment in the federal government. Students are also encouraged to seek assistance with UAB Student Career and Professional Services in Hill Student Center for career planning and placement. MPA faculty and the Program Manager also assist students in job placement. Please **click here** to see what some of our graduates are doing now.

Accelerated Learning Opportunities

Early Acceptance Program

The MPA Program participates in UAB's **Early Acceptance (EA) Program**. The EA Program is designed for academically superior high-school students and allows these students to be conditionally admitted into the MPA Program at the same time they are admitted to an undergraduate program. EA students must maintain a 3.5 undergraduate GPA at UAB to gain admission to the MPA Program. EA students are required to take PSC 101: Foundations of American Government and recommended to take PSC 310: American Public Policy and PSC 323: Public Administration and Policy.

Accelerated Bachelor's/Master's (ABM) Program

The MPA Program participates in UAB's **Accelerated Bachelor's/ Master's (ABM) Program**. The ABM Program allows for undergraduate students to take up to four (4) courses (12 credit hours) that count toward both their Bachelor's and MPA degrees. Undergraduate students seeking admission to the MPA ABM Program must have an undergraduate GPA of at least 3.5 with 60 hours of undergraduate work completed (a minimum of 36 hours must be completed at UAB). In addition, ABM students must maintain a minimum 3.0 GPA while in the ABM Program.

MPA courses approved for shared credit include: MPA 600, MPA 601, MPA 602, MPA 603, MPA 604, MPA 605, MPA 606, and MPA 607.

Joint Degree Programs

Coordinated MPA/MPH Program

The MPA/Master of Public Health (MPH) is designed to train individuals for administrative positions in public health and related health organizations. The Master of Public Administration degree prepares students for careers as administrators in public and nonprofit agencies, and the Master of Public Health provides a background in public health principles and programs. Students must apply and be accepted into both Programs, meeting each Program's entry requirements. Students are required to complete a total of 64-65 semester hours for the coordinated degree. Students complete 10 courses (30 credit hours) in the MPA Program. These courses consist of seven (7) core MPA courses, two (2) MPA electives, and MPA 697 Graduate Learning Portfolio. The remaining credit hours are completed in the MPH Program. Full-time students should be able to complete all degree requirements within three (3) years.

Coordinated MPA/JD Program

The MPA Program at UAB and the Cumberland School of Law at Samford University offer a coordinated MPA/JD Program. The offering of this dual degree reflects recognition of the complex interrelationship between the legal system, public policy analysis, and

public management. It is particularly applicable for those pursuing careers in government and/or public interest law. Students must apply and be admitted to the MPA and JD Programs separately. MPA/JD students complete 10 courses (30 credit hours) in the MPA Program. These courses consist of eight (8) core MPA courses, one (1) MPA elective, and MPA 697 Graduate Learning Portfolio. Close communication with both Programs is required. Depending on prior experience, a field placement/internship may be required.

Coordinated MPA/MSCJ Program

The MPA/Master of Science in Criminal Justice (MSCJ) is targeted toward individuals who wish to gain competencies in public management and the theory/practice of criminal justice. Students must apply and be accepted into both Programs, meeting each Program's entry requirements. Students are required to complete a total of 60 semester hours for the coordinated degree. MPA/MSCJ students complete 10 courses (30 credit hours) in the MPA Program. These courses consist of six (6) core MPA courses, three (3) MPA electives, and MPA 697 Graduate Learning Portfolio. Full-time students should be able to complete all degree requirements within three (3) years.

Certificate Programs

Graduate Certificate in Nonprofit Management

For students interested in managing nonprofit organizations, the Program offers a **Graduate Certificate in Nonprofit Management.** Students seeking admission into the Graduate Certificate in Nonprofit Management must apply to the UAB Graduate School by visiting https://www.uab.edu/graduate/admissions. Contact the MPA Program Manager (ccmayo@uab.edu) for additional information regarding the Graduate Certificate in Nonprofit Management.

Graduate Certificate in Public Management

For students interested in managing public organizations, the Program offers a **Graduate Certificate in Public Management.** Students seeking admission into the Graduate Certificate in Public Management must apply to the Graduate School by visiting https://www.uab.edu/graduate/admissions. Contact the MPA Program Manager (ccmayo@uab.edu) for additional information regarding the Graduate Certificate in Public Management.

Contact Information

For additional information, please visit the UAB MPA Program website: www.uab.edu/mpa. Inquiries about the MPA Program or Graduate Certificates in Nonprofit Management or Public Management should be directed to the MPA Program Manager.

Carin Mayo, MPA Program Manager
Department of Political Science and Public Administration
University of Alabama at Birmingham
HHB 415, 1401 University Boulevard
Birmingham, Alabama 35294-1152
(205) 975-3413 or (205) 934-2339
ccmayo@uab.edu

Master of Public Administration

A total of 39 hours are required to complete the MPA program. For pre-career students, an additional three (3) hours of internship (20 hours/week) is also required, for a total of 42 hours. A full-time student, taking three (3) courses per semester, plus one additional course over the summer, should be able to complete the program within two (2) years. All courses are offered in the evenings or online to accommodate working professionals.

Plan I: Thesis

Requirements		Hours
Core		
MPA 600	Administrative Ethics	3
MPA 601	The Public Policymaking Process	3
MPA 602	Scope of Public Administration	3
MPA 603	Public & Nonprofit Budgeting	3
MPA 604	Human Resources Management	3
MPA 605	Information Management for Government	3
MPA 606	Foundations of PA Research	3
MPA 607	Quantitative Methods for PA	3
MPA 698	Internship in Public Administration	3
Admission to Candidacy		
MPA 696	Independent Study in Public Administration [1]	3
MPA 699	Thesis Research	6
Electives		**6**
MPA 621	Open Government	
MPA 623	Public Administration in Pop Culture	
MPA 662	State and Local Government Administration	
MPA 664	Women in Public Administration	
MPA 665	Crisis Management	
MPA 666	City County Management	
MPA 667	Administrative Law	
MPA 668	Intergovernmental Relations	
MPA 671	Marketing and Fundraising	
MPA 672	Nonprofit Management	
MPA 673	Nonprofit Health	
MPA 674	GIS for Managers	
MPA 675	Equity in Public Administration	
MPA 678	Strategic Planning	
MPA 681	Local Government Planning	
MPA 682	Economic Development	
MPA 683	Public Managerial Economics	
MPA 684	Grants Management	
MPA 686	Data Management	
MPA 687	Resource Management	
MPA 688	Global Public Administration	
MPA 689	Program Evaluation	
MPA 695	Special Topics in Public Administration	
Total Hours		**42**

[1] Students taking the thesis option (Plan I) must takes 3 hours of Independent Study under the guidance of the thesis chair prior to taking the 6 thesis hours (total 9 hours for thesis).

Plan II: Non-Thesis

Requirements		Hours
Core		
MPA 600	Administrative Ethics	3
MPA 601	The Public Policymaking Process	3
MPA 602	Scope of Public Administration	3

MPA 603	Public & Nonprofit Budgeting	3
MPA 604	Human Resources Management	3
MPA 605	Information Management for Government	3
MPA 606	Foundations of PA Research	3
MPA 607	Quantitative Methods for PA	3
MPA 698	Internship in Public Administration	3
Portfolio		
MPA 697	Graduate Learning Portfolio [1]	3
Electives		**12**
MPA 621	Open Government	
MPA 623	Public Administration in Pop Culture	
MPA 662	State and Local Government Administration	
MPA 664	Women in Public Administration	
MPA 665	Crisis Management	
MPA 666	City County Management	
MPA 667	Administrative Law	
MPA 668	Intergovernmental Relations	
MPA 671	Marketing and Fundraising	
MPA 672	Nonprofit Management	
MPA 673	Nonprofit Health	
MPA 674	GIS for Managers	
MPA 675	Equity in Public Administration	
MPA 678	Strategic Planning	
MPA 681	Local Government Planning	
MPA 682	Economic Development	
MPA 683	Public Managerial Economics	
MPA 684	Grants Management	
MPA 686	Data Management	
MPA 687	Resource Management	
MPA 688	Global Public Administration	
MPA 689	Program Evaluation	
MPA 695	Special Topics in Public Administration	
Total Hours		**42**

[1] During the last semester of study, students opting for the non-thesis (Plan II) must register for MPA 697, Graduate Learning Portfolio (GLP), and complete a comprehensive portfolio based on the course work, mission/vision, and career plans.

Graduate Certificate in Public Management

The Graduate Certificate in Public Management provides skills and insights necessary to plan and manage public organizations. The certificate is geared towards professionals who are seeking upward mobility within their organizations, and students seeking to enter the workforce at the local, city, state and federal level. This program is designed to serve those who wish to gain specialized knowledge in the field of public management without committing to a full graduate program. Such specialized knowledge may include, but is not limited to: resource management, intergovernmental relations, administrative law, program evaluation, and public finance. Potential employers seek out applicants with these specific skills, making graduates more attractive for higher than entry-level positions in the local, state, or federal government, as well as private industry.

This Certificate participates in the Interdisciplinary Graduate Studies (IGS) Degree.

Application for the Certificate Program

To complete the Graduate Certificate in Public Management, students must apply to the UAB Graduate School. Application must include:

1. Undergraduate transcripts from accredited institutions;
2. A statement of interest that addresses this prompt:
   a. In 1-2 single-spaced pages (200-500 words), please share why the Graduate Certificate in Public Management at UAB is right for you. Address motivations, ways you want to make change, and vision for your career after obtaining the Certificate. If you have prior academic deficiencies, please also address those in this statement; and
3. One (1) letter of recommendation that meets the below criteria:
   a. This letter must be an academic or professional reference. Academic examples include those from professors or faculty advisors; professional examples include those from supervisors in either a work or volunteer position. Letters from peers, co-workers, friends, etc. are not acceptable.

Students admitted into the MPA program may earn the Graduate Certificate in Public Management alongside their MPA degree. To do this, students are required to contact the MPA Program Manager, Carin Mayo (ccmayo@uab.edu), before they start taking elective courses.

Courses

Students must complete five (5) courses---one required course and four (4) elective courses---totaling 15 credit hours.

Requirements		Hours
MPA 662	State and Local Government Administration	3
Electives (Choose 4)		**12**
MPA 621	Open Government	
MPA 664	Women in Public Administration	
MPA 666	City County Management	
MPA 667	Administrative Law	
MPA 668	Intergovernmental Relations	
MPA 674	GIS for Managers	
MPA 675	Equity in Public Administration	
MPA 678	Strategic Planning	
MPA 681	Local Government Planning	
MPA 682	Economic Development	
MPA 683	Public Managerial Economics	
MPA 686	Data Management	
MPA 687	Resource Management	
MPA 689	Program Evaluation	
MPA 695	Special Topics in Public Administration	

Grades

Students are expected to produce graduate-level work and maintain a cumulative GPA of 3.0 or higher to continue in the program. They are also expected to abide by UAB Graduate School conduct and grade policies.

Registration and Payment

Students are expected to register for at least one course each semester. Payments of tuition and fees are handled through UAB Financial Affairs. All payment problems or inquiries should be directed to that office.

Future Graduate Degree Work

Certificate students who want to apply to the MPA program after completing the public management certification requirements must complete all application requirements as outlined in the Graduate School guidelines. A maximum of four (4) courses (12 hours) with a grade of B or better may be applied toward the MPA degree if the student is accepted in the program.

Successful completion of the Graduate Certificate in Public Management does not automatically admit a student into the MPA program. All application materials must be completed. Students who pursue the MPA degree following certification must complete all course work within seven (7) years of the first course taken in the certificate program.

Questions?

Please contact the MPA Program Manager at ccmayo@uab.edu.

Graduate Certificate in Nonprofit Management

The Graduate Certificate in Nonprofit Management provides practitioners with an opportunity to enhance their skills and improve their capacity to effectively run nonprofit organizations. This Certificate program is designed to serve those who wish to gain specialized knowledge in the field of nonprofit management without committing to a full graduate program. Both on-campus and online courses are offered.

This Certificate participates in the Interdisciplinary Graduate Studies (IGS) Degree.

Application for the Certificate Program

To complete the Graduate Certificate in Nonprofit Management, students must apply to the UAB Graduate School. Application must include:

1. Undergraduate transcripts from accredited institutions;
2. A statement of interest that addresses this prompt:
   a. In 1-2 single-spaced pages (200-500 words), please share why the Graduate Certificate in Nonprofit Management at UAB is right for you. Address motivations, ways you want to make change, and vision for your career after obtaining the Certificate. If you have prior academic deficiencies, please also address those in this statement; and
3. One (1) letter of recommendation that meets the below criteria:
   a. This letter must be an academic or professional reference. Academic examples include those from professors or faculty advisors; professional examples include those from supervisors in either a work or volunteer position. Letters from peers, co-workers, friends, etc. are not acceptable.

Students admitted into the MPA program may earn the Graduate Certificate in Nonprofit Management alongside their MPA degree. To do this, students are required to contact the MPA Program Manager, Carin Mayo (ccmayo@uab.edu), before they start taking elective courses.

Curriculum

Students must complete five (5) courses---one required course and four (4) elective courses---totaling 15 credit hours.

Requirements		Hours
MPA 672	Nonprofit Management	3
Electives (Choose 4)		**12**
MPA 665	Crisis Management	
MPA 671	Marketing and Fundraising	
MPA 673	Nonprofit Health	
MPA 674	GIS for Managers	
MPA 675	Equity in Public Administration	
MPA 678	Strategic Planning	
MPA 684	Grants Management	
MPA 686	Data Management	
MPA 687	Resource Management	
MPA 689	Program Evaluation	
MPA 695	Special Topics in Public Administration	

Grades

Students are expected to produce graduate-level work and maintain a cumulative GPA of 3.0 or higher to continue in the program. They are also expected to abide by UAB Graduate School conduct and grade policies.

Registration and Payment

Students are expected to register for at least one course each semester. Payments of tuition and fees are handled through UAB Financial Affairs. All payment problems or inquiries should be directed to that office.

Future Graduate Degree Work

Certificate students who want to apply to the MPA program after completing the Graduate Certificate in Nonprofit Management must complete all application requirements as outlined in the Graduate School guidelines. A maximum of four (4) courses (12 hours) with a grade of B or better may be applied toward the MPA degree if the student is accepted in the program.

Successful completion of the Graduate Certificate in Nonprofit Management does not automatically admit a student into the MPA program. All application materials must be completed. Students who pursue the MPA degree following certification must complete all course work within seven (7) years of the first course taken in the certificate program.

Questions?

Please contact the MPA Program Manager, Carin Mayo, at ccmayo@uab.edu.

Courses

MPA 600. Administrative Ethics. 3 Hours.
Theories and principles of ethics. Understanding ethical issues and use of ethical principles in resolving ethical dilemma in public organizations.

MPA 601. The Public Policymaking Process. 3 Hours.
Public Policy as a decision-making process. Examines environmental and organizational factors, the choice of alternatives, and the implementation and evaluation of public policy, with applied references to specific functional areas e.g. housing, pollution, energy and transportation.

MPA 602. Scope of Public Administration. 3 Hours.
Explores differences between public and private sector organizations. Examines both institutional and behavioral elements as they apply to public agencies. Covers topics such as budgeting, personnel, ethics, federalism and other fundamentals of public administration.

MPA 603. Public & Nonprofit Budgeting. 3 Hours.
MPA 603 examines the institutions and actors involved in the collection, custody, and expenditure of public revenues. The course combines theory and practical application to teach the principles and techniques used in government and nonprofit budgeting, including the budgeting process and financial management.

MPA 604. Human Resources Management. 3 Hours.
Examines the major concepts, theories, procedures and themes needed for effective management of human resources in the public and nonprofit sectors. Topics include merit and civil service systems, organized public labor, recruitment, classification, performance appraisal, disciplinary and grievance procedures, training and staff development, diversity and anti-discrimination policy and strategies, ethics/morality and personnel law.

MPA 605. Information Management for Government. 3 Hours.
The course is designed to introduce information and related technologies and how it affects people and government in a democracy. Students are exposed to information theory and modern day information technology tools to understand, interpret and manage governmental operations.

MPA 606. Foundations of PA Research. 3 Hours.
An introduction to research methodology presenting quasi-experimental and experimental research designs, exposition of qualitative and basic survey methods, and basic data analysis.

MPA 607. Quantitative Methods for PA. 3 Hours.
MPA 607 introduces basic statistical techniques used by social scientists and public administrators. Designed to provide students with the tools to produce and consume quantitative information, MPA 607 combines theory and application of both descriptive and inferential statistical methods. With real world examples from various policy areas, MPA 607 should make students aware of the many uses of statistics for public and nonprofit leaders and give them the means to employ those practices effectively and efficiently.

MPA 617. Science Policy. 3 Hours.
Science and technology intersect with multiple areas of public policy. Think of the growing concerns over technological surveillance, the debates over policy for climate change mitigation, the challenges posed due to global health crises, or the fear that American research and development competitiveness is eroding in a globalized economy. These issues reflect important questions about the relationship between science, technology, and public policy. Are scientific and technological developments governable, and if so, how and by whom? Is more and better science always better for policymaking? Who is the best judge of the value of scientific research programs and the validity of scientific findings? Are scientific and technological innovations generally socially beneficial, and who decides? What role should policymakers play in regulating science?.

MPA 621. Open Government. 3 Hours.
The course will explore transparency and how governments operate in the context of transparency as well as how they, as consumers, can utilize their right to a transparent government.

MPA 623. Public Administration in Pop Culture. 3 Hours.
Pop culture can be a useful tool for learning about ideas and concepts, especially related to the public sector and its workplaces. In addition, pop culture is thought to represent commonly held sentiments about society and government. This class seeks to connect public administration theories to pop culture in the form of television, movies, podcasts and more. In this class, students will: 1. Learn about various public administration theories; 2. Identify public administration theories in pop culture; 3. Explore how public administration and administrators are portrayed in pop culture; and 4. Think critically about how pop culture contributes to our understandings about government.

MPA 647. Contemporary Political Issues in Science. 3 Hours.
Our rapidly changing world faces significant, multi-faceted problems at the nexus of technology and society. The response to these socio-scientific issues will impact the future of the human condition. The scientific process has a role to play in finding timely, effective, and evidence-based solutions. This course showcases science as a dynamic and iterative process that includes collecting and connecting observations, making hypotheses based on the current understanding, and constructing models that are revised as new knowledge is acquired. It emphasizes the role of dialogue and communication in shaping responses to socio-scientific issues.

MPA 662. State and Local Government Administration. 3 Hours.
This course is designed to introduce students to the study of state and local government administration. Introduces key concepts related to state and local government political structures and institutions; regional, state and county economic performance and state/local government finance.

MPA 664. Women in Public Administration. 3 Hours.
Studies in the leadership of women in public service. Focus on theoretical and professional development of women in government and nonprofit administration.

MPA 665. Crisis Management. 3 Hours.
Management and coordination of institutions to respond, plan, and mitigate crises. Focus on the role of managers in managing short and long term crises.

MPA 666. City County Management. 3 Hours.
Study of the typical nature of local government and the importance of local-state-federal relations, regional cooperation, and the nonprofit and public-private partnership in providing local government services.

MPA 667. Administrative Law. 3 Hours.
Explanation of law in society and the legal setting of public administration. Examination of substantive areas of the study of law including regulatory process, administrative adjudication, the administrative procedures acts, administrative due process, judicial review, liability and citizen's rights.

MPA 668. Intergovernmental Relations. 3 Hours.
The various relations among governments in the U.S. system. Focus on understanding the interactions, attitudes, and behavior of elected officials and bureaucrats of two or more units of government functioning in their public capacities.

MPA 671. Marketing and Fundraising. 3 Hours.
The use of marketing and fundraising strategies for nonprofits. Incorporates both theory and practice as students learn the fundamentals of marketing and resource development and apply them to hands-on projects in local nonprofit agencies.

MPA 672. Nonprofit Management. 3 Hours.
The day-to-day challenges faced by managers of nonprofit agencies, including the challenge of fund raising, balancing competing values as related to efficiency, effectiveness and equity.

MPA 673. Nonprofit Health. 3 Hours.
This course provides a comprehensive overview of role of the Nonprofit Sector and its important contribution to mission and success of our health system and social enterprise in the United States. The course examines various aspects of nonprofit health organizations including history of these agencies, sources of revenue, fund raising and marketing practices, accomplishments and achievements, criticisms and controversies, and the role of volunteer leadership and best management practices.

MPA 674. GIS for Managers. 3 Hours.
Examines the use of Geographic Information Systems (GIS) using GIS software. It integrates theory and socioeconomic applications of GIS in the public and nonprofit sector.

MPA 675. Equity in Public Administration. 3 Hours.
Public administration has four pillars: efficiency, economy, effectiveness, and equity. That last one—equity—joined the other three in the 21st century and does not receive the same attention or stature as the others. This course is designed to provide students with an understanding of social equity by exploring what it means, what equity (or inequity) looks like in policy and practice, and how to ensure equitable policies and institutions.

MPA 678. Strategic Planning. 3 Hours.
Presents the strategic planning process as it is utilized in contemporary settings. Focuses on how the strategic planning process is applied in the public and nonprofit sectors.

MPA 681. Local Government Planning. 3 Hours.
This course examines the historical roots of modern land use planning and explores contemporary issues in planning such as sprawl and smart growth.

MPA 682. Economic Development. 3 Hours.
The course is devoted to understanding economic development practices in the United States. It focuses on how market forces combine with non-economic variables to influence the economic development process. Theories and case studies drawn from various disciplines, particularly economics and public finance, will be used to understand the economic development process.

MPA 683. Public Managerial Economics. 3 Hours.
Application of microeconomic theory to real life problems faced by managers. Emphasis on understanding the complex real life social and economic challenges using economic principles and applying economic decision criteria in solving problems.

MPA 684. Grants Management. 3 Hours.
Covers the essentials of grant-writing and the management of grants.

MPA 686. Data Management. 3 Hours.
MPA 686 provides a unique opportunity for students to explore the data management process. The past decade has seen a dramatic increase in the collection of data, and policy analysts, practitioners, and academic researchers must be equipped with the tools to use this data in an efficient manner. Throughout the semester, we will explore the importance of data and then move to working with primary and secondary data sources. Using Excel and Stata, students will learn how to collect, clean, and present data in ways consistent with best practices in the data management field.

MPA 687. Resource Management. 3 Hours.
Focus on concepts and skills essential to managing public organization resources.

MPA 688. Global Public Administration. 3 Hours.
Focus on concepts and skills essential to administering national and global organizations.

MPA 689. Program Evaluation. 3 Hours.
Analytic tools for evaluating public and nonprofit programs and services.

MPA 690. Seminar in Public Services Issues. 3 Hours.
Examines starting and maintaining a faith-based service organization (FBSO). Topics include role of faith/spirituality, mission, governance, setting, staffing, funding, church/FBSO issues, state/federal involvement, cooperative ventures with other FBSOs, networking.

MPA 695. Special Topics in Public Administration. 3 Hours.
Explores special topics in public administration.

MPA 696. Independent Study in Public Administration. 1-3 Hour.
One-on-one learning experience between student and an instructor. Permission of Program Director required.

MPA 697. Graduate Learning Portfolio. 3 Hours.
May be taken only in the last semester of the program; Permission of MPA Director required.

MPA 698. Internship in Public Administration. 3 Hours.
Supervised field placement in government or a nonprofit agency for directed work experience arranged by the internship coordinator and as per the guidelines in the internship manual. Permission of Graduate Program Director required.

MPA 699. Thesis Research. 3-6 Hours.
Research and writing of thesis. Permission of MPA Director required.
Prerequisites: GAC M

Psychology

Graduate Program

The Doctoral Program in the Department of Psychology offers three concentrations: Behavioral Neuroscience (p. 136), Applied Developmental Psychology (p. 138), and Medical/Clinical Psychology (p. 139). Upon completion of any of these concentrations the student receives a Ph.D. in Psychology. A terminal master's degree is not offered.

Behavioral Neuroscience (p. 136)

Training in Behavioral Neuroscience is designed to prepare students for independent research and teaching in the neurobiology of behavior. Research training is provided by faculty in the Department of Psychology and in the UAB Schools of Medicine and Optometry, who share an interest in the biological basis of behavior. The course of study includes a core curriculum in neuroscience and recognizes the interdisciplinary nature of this field. Students obtain strong backgrounds in behavioral science and in neuroscience and gain expertise in the content and techniques of selected areas of neuroscience as they apply to the study of behavior.

Faculty laboratories are equipped for research in behavior, neuroanatomy, neurochemistry, neuroimaging, neuropharmacology, neurophysiology, and molecular biology. The research interests of the faculty include neuroanatomy and neurophysiology of the visual system; interactions between the central nervous system and the periphery in the control of feeding and energy balance; neural underpinnings of obesity and plasticity in participants in a weight loss program; autism; emotional

substrates of conditioned fear; neurophysiology and neuropharmacology of pain.

Applied Developmental Psychology (p. 138)

Training in Applied Developmental Psychology prepares students to discover and apply basic principles of development across the lifespan in an interdisciplinary research context. Our premise is that the application of psychological principles of development can contribute in important ways to solving problems encountered throughout the lifespan. Graduates are capable of taking positions in institutions of higher learning, medical schools, research institutions, government agencies, nonprofit organizations, and other research and teaching positions.

Research training is provided by the faculty of the Department of Psychology and may occur in collaboration with faculty across campus including the Civitan International Research Center, the Center for Aging, the Center for Applied Gerontology, the Department of Pediatrics, The School of Public Health, and other centers and departments.

The research programs of faculty with interests in lifespan Applied Developmental Psychology include a wide variety of topics from infancy to the elderly. Much of this research is funded by federal research grants. Research subareas include: injury prevention, developmental disabilities (with special interests in Autism Spectrum Disorders, prenatal development and exposure to toxic substances, early intervention, adolescent psychosocial development and mental health); adolescence (with special interest in longitudinal studies, interactions between health and development, alcohol and drug use, predictors of depression and suicide, family and peer relations, those with special health care or education needs); and aging (with special interest in visual-perceptual problems of older adults with low vision, memory skills training with elderly populations, the psychological aspects of chronic illness in the elderly, chronically ill individuals, care giving in families of elderly persons, human factor issues in vision and aging).

Applied Developmental Psychology students must complete a master's thesis. Admission to candidacy for the doctoral degree is based on satisfactory completion of coursework and completion of an area review in the form of a *Psychological Bulletin* or *Psychological Review* article. The doctoral degree is awarded upon successful defense of the dissertation.

Medical/Clinical Psychology (p. 139)

Training in Medical / Clinical Psychology prepares students to become leaders in health promotion, disease prevention, risk reduction, and symptom assessment and amelioration in interdisciplinary and medical settings. Research, course work and clinical training emphasize behavioral and psychological factors associated with medical illness and injury as well as neurobehavioral and psychological disorders across the lifespan. The Medical/Clinical Psychology concentration is accredited as a clinical psychology doctoral program by the American Psychological Association (https://www.apa.org/ed/accreditation/programs/index.aspx).

The Medical/Clinical Psychology concentration is co-sponsored by the Department of Psychology (College of Arts and Sciences) and the UAB School of Medicine. Faculty are distributed across multiple academic departments and divisions, including but not limited to Psychology, Psychiatry, Pediatrics, Neurology, Preventive Medicine, Clinical Immunology and Rheumatology, and Physical Medicine and Rehabilitation. Clinical psychologists and researchers in UAB-affiliated clinics and research centers, the Children's of Alabama Hospital, the Birmingham VA Medical Center and throughout the community also play active roles in teaching as well as research mentoring and clinical supervision.

Research programs in which faculty and students are currently involved include: accidental injury and child abuse risk prevention; adolescence, aging, autism spectrum and other neurodevelopmental disorders and developmental disabilities; chronic pain; coping with medical illness, dementia, eating disorders and obesity; epilepsy; minority health issues and health disparities; neural plasticity; neuroimaging; pediatric oncology; response to stress and psychological trauma; rehabilitation following traumatic brain and spinal cord injury, stroke and neurobehavioral disease; sleep and feeding problems of childhood; and substance abuse.

With appropriate approvals it is possible to complete the Master of Science in Public Health program and the Medical/Clinical Psychology concentration concurrently.

Application and Admissions

Applications are invited both from students with bachelor's degrees and from those who may have already completed some graduate study. Admission to the Psychology graduate program is highly selective. Applications are evaluated as a whole without minimum criteria on any single indicators. Transcripts are evaluated for the content and difficulty of courses completed as well as grades received. All programs follow an affirmative action/equal opportunity process to ensure that all applicants are evaluated fairly and on the basis of their individual merit. Brief information regarding admission to the three Psychology concentrations appears below. For up-to-date details, including deadlines and specific requirements, prospective applicants should consult the Psychology Graduate Program website (https://www.uab.edu/cas/psychology/graduate).

Because of the interdisciplinary nature of Behavioral Neuroscience, students with diverse backgrounds in psychology, biology, and physical science are encouraged to apply. All students are expected to have undergraduate training in psychology, biology, physics, chemistry, and mathematics. Students not trained in one or more of these areas may be required to make up deficits after enrollment.

Applied Developmental Psychology admission requires a solid background in psychology as well as some courses in the life sciences. Research experience is essential. Excellent grades in statistics and mathematics are also valued.

Medical/Clinical Psychology requires a strong background in psychology (including statistics and research design; cognitive, biological, and affective bases of behavior; abnormal psychology and personality). Advanced course work in mathematics and natural science (especially anatomy and physiology) is also recommended. Relevant research experience is considered an important indication of the applicant's motivation and commitment to program goals, and prior experience with clinical populations is also advantageous. The relevance of the applicant's goals and interests to ongoing activities of our faculty is weighed heavily in admissions decisions.

Advisement

Behavioral Neuroscience students are advised by the Behavioral Neuroscience Director in consultation with a program steering committee and by their research preceptors until the dissertation committee is appointed, usually early in the third year of study.

Students accepted into the Applied Developmental Psychology specialization are matched with a faculty member who agrees to mentor that student. Therefore, applicants will need to identify faculty members with whom they share research interest and would like to study.

Medical/Clinical Psychology students are advised by their research mentor, an individually-tailored advisory committee, and the Director of Medical/Clinical Psychology.

Financial Aid

All students in the Psychology Doctoral Program receive financial aid, including a stipend, tuition and health insurance for at least 5 years. Sources of support include fellowships, traineeships, assistantships, and tuition scholarships.

Additional Information

For further information please visit the websites listed below. Questions may be directed to the appropriate Director or to the Psychology Graduate Program Manager, Ms. Terri Roberson, at 205-934-8723 or **trobe@uab.edu**.

Behavioral Neuroscience

Website: http://www.uab.edu/cas/psychology/graduate/behavioral-neuroscience

Dr. David C. Knight, Director
Email **knightdc@uab.edu (amthorfr@uab.edu)**

Applied Developmental Psychology

Website: http://www.uab.edu/cas/psychology/graduate/developmental

Dr. Despina Stavrinos, Director
Email **dstavrin@uab.edu (fbiasini@uab.edu)**

Medical/Clinical Psychology

Website: https://www.uab.edu/cas/psychology/graduate/medical-clinical

Dr. Edwin W. Cook III, Director
Email: **ecook@uab.edu**

Graduate Certificate in Social & Behavioral Statistics

The Graduate Certificate in Social & Behavioral Statistics is available to students currently enrolled in a Graduate Program who have a 3.0 GPA or higher.

Requirements		Hours
SOC 707	Statistical Programming for Social Sciences	3
Advanced Statistics Courses [1]		**12**
PY 719	Multivariate Statistical Methods	
or PY 719L	Lab for Multivariate Statistical Methods	
PY 727	Longitudinal Data Analysis Laboratory	
or SOC 70	Advanced Longitudinal and Multi-level Data Analysis	
PY 746	Structural Equation Modeling	
SOC 704	Categorical Data Analysis	
Total Hours		**15**

[1] Other advanced statistics electives may be approved by the Program Director

Contact

Program Director	Sylvie Mrug, Ph.D.
E-mail	smrug@uab.edu

Courses

PY 520. Special Topics in Psychology. 1-3 Hour.
This course will provide introductory, graduate level training in topics within the fields of behavioral neuroscience, developmental psychology, medical/clinical psychology, and research methods.

PY 619. Diversity, Equity and Inclusion in Research and the Workplace. 1 Hour.
Definitions of the terms diversity, equity, and inclusion continue to evolve in our society and it is essential that individuals have clear understandings of these terms that are shaped by interactions with individuals from a variety of cultures and differing levels of social status. Additionally, research studies can contain selection bias as the individuals who agree to participate may not be representative of the larger populations the studies are targeted to assess. This course will enable students to: (1) receive perspectives on diversity, equity and inclusion from the instructor, experts in the areas, and members of subgroups who have experienced a lack of resources and/or discrimination, (2) learn strategies that can be utilized to provide outreach efforts to the communities they are interested in studying, (3) recruit more representative samples, and (4) foster work environments that are inclusive and not offensive to any team members.

PY 620. Special Topics in Psychology. 1-3 Hour.
This course will provide training in advanced topics in the fields of behavioral neuroscience, developmental psychology, medical/clinical psychology, and research methods.

PY 635. Motivation and Emotion. 3 Hours.
Human emotion and motivated behavior with a focus on the underlying neuroanatomy, neurophysiology, endocrinology, and genetics and their relationship to abnormal conditions.

PY 652. Biofeedback, Meditation and Self-Regulation. 3 Hours.
History and current applications of biofeedback, meditation, and relaxation techniques.

PY 653. Foundations of Behavioral Neuroscience. 4 Hours.
Neural systems which control behavior will be studied, incorporating knowledge gained from neurobiological and psychological research. Topics will include synaptic communication, sensation and perception, movement, genetic influences on behavior, motivation, emotions, psychopathology, brain plasticity, and an extended module on learning.

PY 683. Developmental Disabilities. 3 Hours.
History, causes, treatment/education, interventions, and family issues related to developmental disabilities and other neuro-differences. Psychologist as member of interdisciplinary treatment team. There will be a focus on identifying patterns of strengths and weaknesses in various disorders.

PY 687. The Dynamics of Pain. 3 Hours.
This course provides a comprehensive study of pain, from basic anatomy through clinical treatment and measurement.

PY 693. Cognitive Neuroscience. 3 Hours.
How cognitive processing originates from brains. Focus on synthetic approaches to sensory-input guided behavior implemented in a biologically realistic manner; neurobiological wetware underlying cognition; study and construction of synthetic approaches that emulate biological behavior and psychological processes.

PY 698. Premaster's Degree Graduate Research. 1-12 Hour.
Premaster's Degree Graduate Research.

PY 699. Master's Level Thesis Research. 1-12 Hour.
Master's Level Thesis Research.
Prerequisites: GAC M

PY 701. Professional Issues and Ethics in Psychology. 1 Hour.
Ethics, professionalism, diversity, licensure, and legal issues in health service and academic psychology. Human research ethics in biobehavioral and clinical science.

PY 704. Social Psychology. 3 Hours.
Interpersonal relationships and effects of social environment on social perception and human behavior.

PY 707. Brain and Cognition. 3 Hours.
Integration of cognitive, behavioral, biological, and computational perspectives on perception, attention, learning and memory, language, problem-solving and creativity, and judgment and decision-making.

PY 708. Developmental Psychology. 3 Hours.
Human development from prenatal period to old age. Genetic and environmental determinants of behavior; linguistic, cognitive, intellectual, personality, social, and emotional development.

PY 710. Seminar in Lifespan Developmental Psychology. 1 Hour.
Discussion of scientific and professional development issues related to developmental psychology.

PY 711. Seminar in Cognitive Development. 3 Hours.
Seminar in the development of and changes in memory, perception, learning, and thinking throughout the lifespan.

PY 712. Seminar in Social Development. 3 Hours.
Theory and research related to attachment, origins of the self and self-esteem, family relationships, peer relationships, morality, and aggression.

PY 713. Seminar in Language Development. 3 Hours.
Research and theory related to normal and deviant language development.

PY 716. Introduction to Statistics and Measurement. 3 Hours.
Probability, measurement, descriptive statistics, sampling distributions, null hypothesis significance testing, means comparisons, correlation, regression, reliability, validity, categorical data analysis, and nonparametric methods.

PY 716L. Lab for Introduction to Statistics and Measurement. 1 Hour.
Computer laboratory for PY 716 Introduction to Statistics and Measurement.

PY 717. Applied Statistical Methods. 3 Hours.
Statistical hypothesis testing in the context of the univariate general linear model: 1-way and factorial analysis of variance, multiple comparison procedures, multiple regression and repeated measures.
Prerequisites: PY 716 [Min Grade: C]

PY 717L. Lab for Applied Statistical Methods. 1 Hour.
Computer laboratory for PY 717 Applied Statistical Methods.
Prerequisites: PY 716L [Min Grade: C]

PY 718. Advanced Research Design. 3 Hours.
Presentation and discussion of advanced topics in research design, such as statistical and experimental control, adaptive and other between-groups experimental designs, and program evaluation. The class culminates in preparation of a research grant application.

PY 719. Multivariate Statistical Methods. 3 Hours.
Multiple regression, mediation and moderation, multivariate analysis of variance, logistic regression, principal components and factor analysis, and introduction to structural equation modeling.
Prerequisites: PY 717 [Min Grade: C]

PY 719L. Lab for Multivariate Statistical Methods. 1 Hour.
Laboratory for PY 719 Multivariate Statistical Methods.
Prerequisites: PY 717L [Min Grade: C]

PY 720. Human Neuropsychology. 3 Hours.
Structure and function of human brain; effects of neurological impairment on cognitive, affective, and personality functions.
Prerequisites: PY 707 [Min Grade: C](Can be taken Concurrently) or PY 653 [Min Grade: C](Can be taken Concurrently) or PY 693 [Min Grade: C] (Can be taken Concurrently)

PY 721. Neuropsychological Assessment. 3 Hours.
Assessment of various types of neuropsychological disorders, including interpretation of test results and communication of findings via oral presentations and written reports. Emphasis is on analytical thinking, ethical considerations, practical applications of neuroscientific research and incorporating knowledge of ethnic and cultural factors.
Prerequisites: PY 720 [Min Grade: C]

PY 727. Longitudinal Data Analysis Laboratory. 3 Hours.
Hands-on advanced statistics class focusing on analyses of longitudinal data. Topics include multilevel (hierarchical) models, latent growth curve models, Generalized Estimating Equations, and group-based longitudinal models.
Prerequisites: PY 719 [Min Grade: C]

PY 729. Seminar in Adolescent Development. 3 Hours.
Seminar in Adolescent Development. Theoretical models and empirical findings related to biological, psychological, and socio-historical changes in adolescent development.
Prerequisites: PY 719 [Min Grade: C]

PY 731. Health Psychology. 3 Hours.
Prevention, health enhancement and intervention. Environmental, interpersonal and marketplace factors in health and disease. Basic concepts, methods and instruments in health psychology assessment.

PY 734. Applied Developmental Psychology. 3 Hours.
Creating programs and policies to apply developmental science in order to improve human development. Establishing partnerships for developing and sustaining the applied scientific research on which such programs and policies are based.

PY 737. Psychology of Eating Disorders & Obesity. 3 Hours.
History, epidemiology, genetic, environmental, and behavioral correlates and prevention and treatment strategies of eating disorders and obesity; mechanisms of normal feeding and weight control and research methods used to understand other psychiatric disorders.

PY 740. Adult Personality and Psychopathology. 3 Hours.
Fundamental theories, concepts, issues, and methodologies of adult psychopathology and its relationship to normal personality and personality disorders. Focuses on the major syndromes of mental disorder from both biological and psychosocial perspectives.

PY 741. Child and Adolescent Psychopathology and Treatment. 3 Hours.
Development, etiology, diagnosis and treatment of emotional and behavioral disorders affecting children and adolescents. Incorporates historical and contemporary issues pertaining to their phenomenology, comorbidity, and epidemiology along with cultural, ethical and professional issues germane to clinical care.
Prerequisites: PY 708 [Min Grade: C]

PY 742. Sport Psychology. 3 Hours.
Psychological factors in athletic performance. Psychological characteristics of successful athletes; anxiety arousal, motivation, attention, concentration, attribution, cognition, and imagery.

PY 746. Structural Equation Modeling. 3 Hours.
Basic steps in structural equation modeling - model identification, estimation, evaluation and modification - as well as advanced topics such as confirmatory factor analysis, latent variables, multi-group modeling, analysis of non-normally-distributed and categorical data, missing data, and sample size estimation.
Prerequisites: PY 719 [Min Grade: C]

PY 749. Social Psychophysiology. 3 Hours.
Current research on the effects of the social world on hormonal responses (cortisol, testosterone etc.). Several research articles will be discussed every week in a seminar format.

PY 751. Human Psychopharmacology. 2 Hours.
Neurophysiological underpinnings and clinical use of drugs for the treatment of mental disorders and pain.

PY 754. Advanced Topics in Behavioral Neuroscience. 3 Hours.
Methods and discoveries in the neuroscience of behavior, such as brain imaging, human and animal learning, perception, neurophysiology, neuropharmacology and psychiatric disorders. Most students will have taken 753/453 as a prerequisite, but other high level neuroscience courses may also suffice with permission of the instructor.
Prerequisites: PY 753 [Min Grade: C]

PY 756. Research Seminar in Behavioral Neuroscience. 1 Hour.
Scientific and professional development including scientific writing and communication skills, discussion of current literature, and presentation of ongoing research from students in the Behavioral Neuroscience doctoral program.

PY 760. Interviewing and Behavioral Observation. 2 Hours.
Theory and practice of interviewing and behavioral assessment with adult and child populations.

PY 764. Cognitive Assessment: Child and Adult. 3 Hours.
Cognitive assessment of children and adults focusing on issues related to assessment, Bayley Scales of Infant/Toddler Assessment, Differential Ability Scales, Wechsler scales and additional cognitive, academic, memory, and learning tests.

PY 765. Personality Assessment. 2 Hours.
Objective personality assessment, primarily focusing on Minnesota Multiphasic Personality Inventory.

PY 769. Cognitive Behavior Therapy. 3 Hours.
Review of cognitive behavioral theory and methods with emphasis on empirically validated individual and group, including brief, interventions.

PY 770. Survey of Psychotherapeutic Methods. 3 Hours.
Procedures for changing maladaptive behavior. Research and methodological issues, factors common to most therapy, and major therapeutic techniques.

PY 777. Psychotherapy Practice Shadowing. 1 Hour.
Introduction to psychotherapy practice by sitting in on therapy (consented) with a practicing psychologist.

PY 779. Foundations of Clinical Supervision and Consultation. 1 Hour.
Methods, models, and ethical considerations related to clinical supervision and interprofessional consultation in diverse cultural and professional contexts.

PY 785. Psychology of Aging. 3 Hours.
The relationship between aging and health, cognitive function, intelligence, personality, relationships, and psychopathology. Other topics covered in this course include assessment and treatment of psychological disorders in older adults, end-of-life issues, caregiving and dementia.

PY 788. Pediatric Psychology. 2 Hours.
Behavioral influences on health and illness; impact of health problems and illness on behavior and development of children and adolescents; family issues related to these interactions.

PY 790. Internship in Clinical Psychology. 9 Hours.
Completion of an APA-accredited internship in clinical psychology.

PY 791. Special Topics in Psychology. 1-3 Hour.
Topics and prerequisites vary.

PY 792. Introduction to Neurobiology. 6 Hours.
Introduction to the neurobiological bases of neuronal communication and behavior. Topics include invertebrate and vertebrate neuroanatomy, neurons and glia, resting potentials, action potentials, synaptic transmission, neurotransmitters and receptors, sensory transduction, and sensorimotor integration. The course is taught at Dauphin Island Sea Lab Facilities, Dauphin Island, Alabama.

PY 795. Community Practicum in Psychology. 1-3 Hour.
This course will provide academic credit for training and supervised experiences in selected community service agencies. Service learning is a significant component of this course.

PY 796. Practicum in the Teaching of Psychology. 1-9 Hour.
Practicum in the teaching of psychology.

PY 797. Clinical Practicum in Medical Psychology. 1-4 Hour.
Practicum training in clinical and medical psychology, supervised by a licensed mental health professional.

PY 798. Predoctoral Degree Graduate Research. 1-12 Hour.
Predoctoral degree graduate research.

PY 799. Doctoral Dissertation Research. 1-12 Hour.
Doctoral dissertation research.
Prerequisites: GAC Z

Behavioral Neuroscience

To obtain specific instructions for how to apply to the M.S. and/or Ph.D. in Behavioral Neuroscience, prospective students should visit this page: https://www.uab.edu/cas/psychology/graduate-programs/behavioral-neuroscience

The curriculum in Behavioral Neuroscience provides a student with advanced training that is broadly based in neuroscience. All students have a plan of coursework that includes Overview of Behavioral Neuroscience, a two-semester statistics sequence (PY 716-PY 717), and an ongoing seminar in current research (PY 756). Advanced academic coursework is determined by the student and mentor. The student initially rotates among faculty and laboratories during the first year to obtain breadth in points of view and experimental techniques. Student then

chooses a mentor with whom they normally complete the remainder of their research training. Before admission to candidacy, each student must complete a 2nd Year research requirement and pass the qualifying examination. Following acceptance of a proposal for dissertation research, the student is admitted to candidacy. The Ph.D. degree is awarded upon successful defense of the dissertation.

Plan 1 Thesis

Requirements		Hours
PY 653	Foundations of Behavioral Neuroscience	4
PY 716 & 716L	Introduction to Statistics and Measurement and Lab for Introduction to Statistics and Measurement	4
Required Statistics Elective		3-4
PY 717 & 717L	Applied Statistical Methods and Lab for Applied Statistical Methods	
PY 718	Advanced Research Design	
Program Electives [1]		**19**
Plan 1 Thesis Research		
PY 698	Premaster's Degree Graduate Research	6
PY 699	Master's Level Thesis Research	6
Total Hours		**42-43**

Plan 2 Non-Thesis

Requirements		Hours
PY 653	Foundations of Behavioral Neuroscience	4
PY 716 & 716L	Introduction to Statistics and Measurement and Lab for Introduction to Statistics and Measurement	4
Required Statistics Elective		**3-4**
PY 717 & 717L	Applied Statistical Methods and Lab for Applied Statistical Methods	
PY 718	Advanced Research Design	
Program Electives [1]		**19**
Total Hours		**30-31**

[1] Program Electives:
PY 520, PY 620, PY 635, PY 687, PY 693, PY 704, PY 707, PY 708, PY 717, PY 717L, PY 718, PY 719, PY 719L, PY 720, PY 746, PY 792, NBL 625

If entering with a baccalaureate degree:

- Completion of 48 credit hours of course work prior to candidacy.
- Up to 16 credits of the 48 can be as non-dissertation research credits.
- Up to 10 credits of the 48 can be as lab rotation, seminar, or directed study credits.
- Must complete at least two semesters in candidacy and accumulate at least 24 credit hours in 799 research **OR**
  - must complete at least two semesters in candidacy and have accumulated at least 12 credit hours in 799 research **AND**, either during or before candidacy, 12 credit hours in other appropriate research-based coursework that has been approved by the graduate student's program.

If entering with a previous Masters degree appropriate to the PhD degree field:

- Completion of 27 credit hours of course work prior to candidacy.
- Up to 6 credits of the 27 can be as non-dissertation research credits.
- Up to 6 credits of the 27 can be as lab rotation, seminar, or directed study credits.
- Must complete at least two semesters in candidacy and accumulate at least 24 credits in 799 research **OR**
  - must complete at least two semesters in candidacy and have accumulated at least 12 credit hours in 799 research **AND**, either during or before candidacy, 12 credit hours in other appropriate research-based coursework, which has been approved by the graduate student's program.

Requirements		Hours
PY 792	Introduction to Neurobiology (Summer Before Year One) [1]	6
Year One		
PY 619	Diversity, Equity and Inclusion in Research and the Workplace	1
PY 653	Foundations of Behavioral Neuroscience	4
PY 716 & 716L	Introduction to Statistics and Measurement and Lab for Introduction to Statistics and Measurement	4
PY 717 & 717L	Applied Statistical Methods and Lab for Applied Statistical Methods	4
PY 756	Research Seminar in Behavioral Neuroscience	2
PY 798	Predoctoral Degree Graduate Research	4-6
Psychology Elective [2]		3
Year Two		
PY 756	Research Seminar in Behavioral Neuroscience (Take Twice in Year Two)	1
PY 756	Research Seminar in Behavioral Neuroscience	1
PY 798	Predoctoral Degree Graduate Research	7
PY 798	Predoctoral Degree Graduate Research (Summer of Year Two)	3-5
Three Psychology Electives [2]		9
Year Three		
GRD 717	Principles of Scientific Integrity	3
PY 756	Research Seminar in Behavioral Neuroscience (Take Twice in Year Three)	1
PY 756	Research Seminar in Behavioral Neuroscience	1
PY 798	Predoctoral Degree Graduate Research	12
PY 798	Predoctoral Degree Graduate Research	1
PY 798	Predoctoral Degree Graduate Research (Summer of Year Three)	3-5
Year Four		
PY 756	Research Seminar in Behavioral Neuroscience (Take Twice in Year Four)	1
PY 756	Research Seminar in Behavioral Neuroscience	1
PY 799	Doctoral Dissertation Research	4
PY 799	Doctoral Dissertation Research	12
PY 799	Doctoral Dissertation Research (Summer of Year Four)	3-5
Year Five		
PY 756	Research Seminar in Behavioral Neuroscience (Take Twice in Year Five)	1
PY 756	Research Seminar in Behavioral Neuroscience	1
PY 799	Doctoral Dissertation Research	12
PY 799	Doctoral Dissertation Research	4
PY 799	Doctoral Dissertation Research (Summer of Year Five)	3-5
Total Hours		**112-122**

[1] PY 792 is completed during the summer, mid July to August, prior to the first semester in the Behavioral Neuroscience program.

[2] Elective Classes: PY 520, PY 620, PY 635, PY 687, PY 693, PY 717, PY 717L, PY 718, PY 719, PY 719L, PY 720, PY 727, PY 746, PY 751, PY 791, BY 511, BY 616, BY 648, BME 664, BME 764, BME 665, BME 765, CH 561, CH 562, CS 665, NBL 729, NBL 730, NTR 718, PHR 701

Dauphin Island

Prior to starting the first semester of courses, students attend a three week course held at the Dauphin Island Research Facility. This course introduces students to many of the basic techniques and issues in the field of neuroscience and is paid for by the department.

Applied Developmental Psychology

To obtain specific instructions for how to apply to the graduate programs in Applied Developmental Psychology, prospective students should visit this page: https://www.uab.edu/cas/psychology/graduate/developmental

Each student in the Applied Developmental Psychology program is encouraged to develop a systematic line of research that complements that of his or her advisor. With intense exposure to an important aspect of developmental research, the student acquires skills that can be generalized to a variety of problems. Students are required to complete a core curriculum which includes 21 hours of Applied Developmental Psychology classes, 15 hours of research design and statistics, 9 hours of general psychology and related discipline classes; 6 hours of teaching practicum and teaching; and at least 48 credit hours of research.

Applied Developmental Psychology students must complete a master's thesis. Admission to candidacy for the doctoral degree is based on satisfactory completion of coursework and completion of an area review in the form of a *Psychological Bulletin* or *Psychological Review* article. The doctoral degree is awarded upon successful defense of the dissertation.

M.S. in Applied Developmental Psychology

Requirements		Hours
Required Coursework [1]		**25**
PY 619	Diversity, Equity and Inclusion in Research and the Workplace	
PY 708	Developmental Psychology	
PY 710	Seminar in Lifespan Developmental Psychology	
PY 716 & 716L	Introduction to Statistics and Measurement and Lab for Introduction to Statistics and Measurement	
PY 717 & 717L	Applied Statistical Methods and Lab for Applied Statistical Methods	
PY 719 & 719L	Multivariate Statistical Methods and Lab for Multivariate Statistical Methods	
Thesis Research		**6**
PY 699	Master's Level Thesis Research	
Elective Options in Developmental Psychology [2]		
Select three from the list below		
PY 683	Developmental Disabilities	
PY 711	Seminar in Cognitive Development	
PY 712	Seminar in Social Development	
PY 713	Seminar in Language Development	
PY 734	Applied Developmental Psychology	
PY 764	Cognitive Assessment: Child and Adult	
Total Hours		**31**

[1] Individual course requirements may be waived based on evaluation of coursework completed prior to matriculation, either at UAB or elsewhere. If a course requirement is waived, then the credit hours must be replaced by approved electives or by coursework required for the doctoral degree in Applied Developmental Psychology. Course waivers may not exceed half of the required credit hours across the master's and doctoral degrees in Applied Developmental Psychology; research and practicum hours are not included in this computation. No course may satisfy requirements for both the master's in Applied Developmental Psychology and another degree, whether completed at UAB or elsewhere.

[2] Other courses may be considered with Program Director approval.

Ph.D. in Applied Developmental Psychology

Requirements		Hours
Required Coursework [1,2]		
PY 708	Developmental Psychology	3
PY 718	Advanced Research Design	3
PY 729	Seminar in Adolescent Development	3
PY 785	Psychology of Aging	3
PY 796	Practicum in the Teaching of Psychology	6
GRD 717	Principles of Scientific Integrity	3
Doctoral Research [3]		**24**
PY 798	Predoctoral Degree Graduate Research	
PY 799	Doctoral Dissertation Research	
Select one from the following		**3**
PY 746	Structural Equation Modeling	
PY 727	Longitudinal Data Analysis Laboratory	
Select two courses from the following		**6**
PY 704	Social Psychology	
PY 720	Human Neuropsychology	
PY 731	Health Psychology	
PY 742	Sport Psychology	
PY 788	Pediatric Psychology	
PY 795	Community Practicum in Psychology	
Total Hours		**54**

[1] Individual course requirements may be waived based on evaluation of coursework completed prior to matriculation, either at UAB or elsewhere. If a course requirement is waived, then the credit hours must be replaced by approved electives. Course waivers may not exceed half of the required credit hours across the master's and doctoral degrees; research and teaching practicum hours are not included in this computation. No course may satisfy requirements for both the doctorate and another degree, whether completed at UAB or elsewhere.

[2] At least 24 hours must be completed prior to admission to candidacy. Remaining hours must include at least 15 hours of graduate-level Psychology coursework. PY 798 does not count towards this 15 hour coursework minimum.

[3]
- Students who do not meet the 24-hour minimum in this category due to course waivers can make up the deficit with any combination of the following:

- Other elective courses approved by the program for this purpose.
- Up to 3 additional hours of non-dissertation research credits (PY 698, 699, and 798) that were not used to satisfy requirements for the master's degree.

Medical/Clinical Psychology

To obtain specific instructions for how to apply to the graduate Ph.D. in Medical/Clinical Psychology, prospective students should visit this page: https://www.uab.edu/cas/psychology/graduate-programs/medical-clinical-psychology

The Ph.D. in Medical/Clinical Psychology places strong emphasis on integration of biological and behavioral sciences. Thus, the research and clinical training that the program provides assumes an undergraduate background in both psychology and life science. The program engages students in continued pursuit of knowledge and skill fundamental to research and clinical practice. In addition, students focus their research and a clinical training in one or more of the several areas of clinical and health psychology that the program emphasizes, and pursue advanced scientific and applied coursework, clinical practica, and directed research activities that culminate in the doctoral dissertation.

Course requirements for the Ph.D in Medical/Clinical Psychology include:

1. General Psychology and Neuroscience – cognitive, biological, social, emotional and developmental bases of behavior, as well as the history of the discipline
2. Statistics and Research Design – statistical methods, research design, and the responsible conduct of research. The statistics courses have associated computer labs.
3. Foundations of Clinical and Health Psychology – personality, psychopathology, an overview of psychotherapeutic methods, health psychology and the ethics of professional practice
4. Psychological Assessment and Intervention – interviewing; behavioral, cognitive and personality assessment; and an introduction to cognitive-behavior therapy.

Additional courses and/or seminars may be taken as electives and may be required depending on the student's area(s) of emphasis.

Students in Medical/Clinical Psychology are actively engaged in research throughout the time that they are enrolled in the program and typically complete a master's thesis project during their second or third year. Clinical practicum experiences begin in the summer of the first year, and in their final year students complete an APA-accredited clinical psychology internship, typically in a medical facility. The doctoral degree is awarded upon successful defense of the dissertation and completion of the internship.

Master of Science in Medical/Clinical Psychology

Requirements		Hours
Graduate Coursework [1]		**24**
PY 701	Professional Issues and Ethics in Psychology	
PY 619	Diversity, Equity and Inclusion in Research and the Workplace	
PY 716 & 716L	Introduction to Statistics and Measurement and Lab for Introduction to Statistics and Measurement	
PY 717 & 717L	Applied Statistical Methods and Lab for Applied Statistical Methods	
PY 740	Adult Personality and Psychopathology	
PY 760	Interviewing and Behavioral Observation	
PY 764	Cognitive Assessment: Child and Adult	
PY 765	Personality Assessment	
PY 770	Survey of Psychotherapeutic Methods	
PY 777	Psychotherapy Practice Shadowing	
Thesis Research		**6**
PY 699	Master's Level Thesis Research	
Total Hours		**30**

[1] Individual course requirements may be waived based on evaluation of coursework completed prior to matriculation, either at UAB or elsewhere. If a course requirement is waived, then the credit hours must be replaced by approved electives or by coursework required for the doctoral degree in Medical/Clinical Psychology. Course waivers may not exceed half of the required credit hours across the master's and doctoral degrees in Medical/Clinical Psychology; research, clinical practicum and internship hours are not included in this computation. No course may satisfy requirements for both the master's in Medical/Clinical Psychology and another degree, whether completed at UAB or elsewhere.

PhD in Medical/Clinical Psychology

Requirements		Hours
Required Coursework [1,2]		**28**
PY 704	Social Psychology	
PY 707	Brain and Cognition	
PY 708	Developmental Psychology	
PY 718	Advanced Research Design	
PY 719 & 719L	Multivariate Statistical Methods and Lab for Multivariate Statistical Methods	
PY 720	Human Neuropsychology	
or PY 731	Health Psychology	
or PY 741	Child and Adolescent Psychopathology and Treatment	
PY 769	Cognitive Behavior Therapy	
PY 779	Foundations of Clinical Supervision and Consultation	
PY 797	Clinical Practicum in Medical Psychology	
PY 798	Predoctoral Degree Graduate Research	
GRD 717	Principles of Scientific Integrity	
Waiver Deficit [3]		
Doctoral Dissertation		**12**
PY 799	Doctoral Dissertation Research	
Internship [4]		**27**
PY 790	Internship in Clinical Psychology	
Total Hours		**67**

[1] Individual course requirements may be waived based on evaluation of coursework completed prior to matriculation, either at UAB or elsewhere. If a course requirement is waived, then the credit hours must be replaced by approved electives. Course waivers may not exceed half of the required credit hours across the master's and doctoral degrees in Medical/Clinical Psychology; research, clinical practicum and internship hours are not included in this computation. No course may satisfy requirements for both the doctorate in Medical/Clinical Psychology and another degree, whether completed at UAB or elsewhere.

[2] At least 28 hours (including 3 hours of GRD 717) must be completed prior to admission to candidacy. Remaining hours must include at least 15 hours of graduate-level Psychology coursework. PY 797 and PY 798 do not count towards this 15 hour coursework minimum.

[3] Students who do not meet the 28-hour minimum in this category due to course waivers can make up the deficit with any combination of the following:

- Other elective courses approved by the program for this purpose.
- Up to 3 additional hours of non-dissertation research credits (PY 698, 699, and 798) that were not used to satisfy requirements for the master's degree.

[4] Includes 12 hours that satisfy the Graduate School's requirement for "appropriate research-based coursework which has been approved by the graduate student's program."

Social Work

Department of Social Work MSW Program

Training the finest professionals in the areas of clinical/medical social work requires settings that provide the best opportunities for students to develop the complex skills needed to provide services.

Students in the UAB Master of Social Work program will receive advanced training using an innovative model of evidence-based education in the resource-rich environment provided by UAB, including world-class Schools of Medicine and Public Health.

The MSW program will prepare students for clinical and community practice, including specific focus on interventions demonstrated to be effective for specific populations. Combining extensive internships in health and mental health settings with coordinated classroom learning, students will be uniquely trained in clinical and community practice.

The MSW is a terminal professional degree, focusing on developing advanced practice competencies. The majority of non-academic Social Work jobs are at this level, and an MSW degree is required to achieve licensure for independent clinical practice.

The program is accredited by the Council on Social Work Education.

Program Requirements

We offer four curricular pathways to obtain the MSW including full-time and new part-time program options (beginning Fall 2021).

Regular Program (Full-Time)

This MSW curriculum consists of 60 credit hours, divided into foundation level (12 hours) and concentration level (48 hours). Courses are sequenced so that students will graduate in four semesters. Foundation courses are compressed into a single semester, allowing students three semesters to gain advanced clinical skills. The concentration sequence is three semesters of coursework with specific focus on courses aimed at developing specific practice competencies, and courses on the specific populations who will be the recipients of behavioral health and health interventions. Regular Program students have field experiences over four semesters consisting of 900 total contact hours.

Advanced Standing (Full-Time)

Students holding a Bachelor of Social Work degree from a program accredited by the Council on Social Work Education (CSWE) may be admitted to the MSW program with advanced-standing status. The Advanced Standing curriculum consists of 42 credit hours and is completed over three semesters (Fall/Spring/Fall). Advanced Standing students have field experiences over three semesters consisting of 600 total contact hours.

Regular Program (Part-Time)

The part-time version of the Regular Program curriculum consists of 61 credit hours, divided into foundation level (12 hours) and concentration level (49 hours). Courses are sequenced so that students will graduate in four years (11 semesters, including summers).

Advanced Standing (Part-Time)

Students holding a Bachelor of Social Work degree from a CSWE-accredited BSW program may be admitted to the MSW program with advanced-standing status. The part-time version of the Advanced Standing curriculum consists of 42 credit hours and is completed over 2.5 years (7 semesters, including summers).

Field Practicum

In the Field Practicum, students are prepared for post-graduate employment through a series of experiences in community agencies. Students are paired with Field Supervisors who are professionals with at least two years of post-graduate experience.

Activities in the field are sequenced to lead to independent practice, beginning in the initial setting with practice simulations and service learning in community agencies, continuing on with shadowing and supervised direct practice. The field experience is integrated across the curriculum, including conducting a research project as part of field practicum experience, and assignments paired to practice courses.

The field experience uses closely monitored experiences in community settings to allow students more direct experience. This approach is designed to increase student readiness for the more specialized upper level practice associated the clinical social work.

Admissions Requirements

An admissions packet will consist of:

- Academic transcripts with GPAs (note: please have transcripts mailed directly to the UAB Graduate School — transcripts will not be accepted in the Department)
- Two recommendation letters, ideally one academic and one professional (note: please ask individuals to upload formal letters of recommendation to the Graduate School application — recommendation letters will not be accepted in the Department). Letters must be signed by the recommendation writer to be accepted.
- A professional resume
- A personal statement about your path to social work and professional goals (writing prompt found in application)
- A formal academic writing sample (writing prompt found in application)
- International students will be required to submit scores from the TOEFL

Additional admissions requirements established by the UAB Graduate School include: completion of a Bachelor's degree (or higher) with a minimum GPA of 3.0 (on a four-point scale) in junior and senior level course work. The GRE is not required.

Master of Social Work in Clinical/ Medical Social Work

Students who have a non-social work undergraduate degree from an accredited College or University may be admitted as a student to 2-year (4 semesters/60 credits) curriculum (Regular admission). Students who hold a BSW from a social work program accredited by the Council on Social Work Education may apply for Advanced Standing admission. Students entering the program as Advanced Standing are not required to complete Foundation courses and begin with the advanced curriculum (3 semesters/42 credits).

Requirements		Hours
SW 510	Social Work Practice with Individuals, Groups & Organizations	3
SW 520	Social Work Policy	3
SW 530	Research I	3
SW 610	Diagnosis and Assessment for Health and Behavioral Health	3
SW 640	Human Behavior in the Social Environment for Health and Behavioral Health	3
SW 630	Research with Health and Behavioral Health Populations I	3
SW 631	Research with Health and Behavioral Health Populations II	3
SW 615	Evidence-informed Interventions in Health and Behavioral Health I	3
SW 620	Policy Analysis and Advocacy Practice for Health and Behavioral Health	3
Field Work [1]		**22-24**
SW 590	Field Practicum I	
SW 591	Field Practicum Seminar I	
SW 690	Field Practicum II	
SW 693	Field Practicum Seminar II	
SW 691	Field Practicum III	
SW 694	Field Practicum Seminar III	
SW 692	Field Practicum IV	
SW 695	Field Practicum Seminar IV	
SW 696	Field Practicum V	
Electives [2]		**9**
SW 599	Special Topics	
SW 650	Evidence-Based Practice in Mental Health	
SW 651	Evidence-Based Practice in Addictions	
SW 653	Social Work Practice along the HIV Continuum of Care	
SW 654	Health and Well-Being of Black Americans: A Social Work Approach	
SW 655	Exploring Diversity and Social Justice in Social Work Practice	
Total Hours		**58-60**

[1] **Total credit hours of field work for each program are:**

- Regular Program FT: 24
- Regular Program PT: 22
- Advanced Standing FT: 15
- Advanced Standing PT: 15

[2] **Regular Program Part-time students must take four electives for a total of 12 credit hours.**

Courses

SW 510. Social Work Practice with Individuals, Groups & Organizations. 3 Hours.
The primary goal of this course is to introduce students to the profession's change process that facilitates change and improves social functioning. Students will learn about the advanced generalist model application of social work practice with individuals, families, groups, communities and organizations. Students will be introduced to the principles of evidence-based practice. The course also explores theories, concepts, and knowledge about human development and behavior. In addition content includes discussion of how factors such as social class, sexual orientation, gender, physical ability, age, race, ethnicity, and culture influence human development and behavior. The course also focuses on adherence to NASW Code of Ethics and ethical practice.

SW 520. Social Work Policy. 3 Hours.
This course provides the foundation for social welfare policy and policy practice for social workers. It helps understand what social welfare is, its historical background, and values and beliefs that have shaped social welfare policy and analysis of social welfare policies. Issues around poverty and economic inequality, key social welfare policies and programs, and policy making processes will be discussed to help evaluate status-quo policies and advocate for vulnerable populations.

SW 530. Research I. 3 Hours.
This is the foundation research course that covers basic research methods, provides the foundation to conduct evidence-based practice and evaluation of practice. Students will be introduced to basic types and methods of research and evaluation, with a focus on deductive methods. Students will be introduced to statistical analyses and learn descriptive statistics as part of their quantitative data education. Students will learn ethics related to research and evaluation.

SW 590. Field Practicum I. 2 Hours.
Practicum I is a foundational level practicum experience. Students participate in a 100 hour clinical placement in an approved social service agency under supervision of master's-level social workers. This course has a weekly one-hour seminar/lab. This course includes both classroom learning and simulation and service learning opportunities in health and behavioral settings. SW 590 is developed to provide students who do not enter with any direct practice experience initial skills that allow them to succeed as they move into the later Field Practicum classes. Educational experiences will include simulation and service learning experiences in community health and mental health.

SW 591. Field Practicum Seminar I. 1 Hour.
Practicum I is a foundational level practicum experience. Students participate in a 115 hour clinical placement in an approved social service agency under supervision of master's-level social workers. This course has a weekly one-hour seminar/lab. This course includes both classroom learning and simulation and service learning opportunities in health and behavioral settings. SW 590 is developed to provide students who do not enter with any direct practice experience initial skills that allow them to succeed as they move into the later Field Practicum classes. Educational experiences will include simulation and service learning experiences in community health and mental health.

SW 599. Special Topics. 1-3 Hour.
Special topics in social work.

SW 610. Diagnosis and Assessment for Health and Behavioral Health. 3 Hours.
The purpose of this course is to educate the student in formal assessment processes using standardized diagnostic tools. Specifically, students will learn to conduct multidimensional assessments using the Diagnostic and Statistical Manual (DSM) and International Statistical Classification of Diseases and Related Health Problems(ICD). Students will learn differential diagnosis for both mental disorders and specific health conditions, including HIV/AIDS. Training in assessment of diagnosis will include interview skills engaging the client or family system to elicit accurate information around specific symptoms and diagnostic rule-outs, explore the effect of culture and diversity on reporting symptoms, understand how socioeconomic factors can impact on both the reporting and severity of specific symptoms, conduct assessments in a professional and ethical manner, and how to write up diagnostic statements for both mental health and health conditions. Students will be trained on how to use this information as Social Workers on a multidisciplinary team to advocate for appropriate use of the diagnosis in designing interventions.

SW 615. Evidence-informed Interventions in Health and Behavioral Health I. 3 Hours.
The purpose of this course is to train students on providing evidence-based interventions for children and families addressing health and behavioral health conditions. Students will be trained in skills in identifying appropriate evidence-based practices, then translating and implementing these practices at appropriate individual and families. Identifying appropriate evidence-based practices will include the ability to ask answerable questions, identify relevant available material,assess the evidence-supporting material, and make evidence-driven decisions based on available information. Translating and implementing practices includes awareness of individual-level information as well as available resources in the various practice settings. In translating and implementing practices, particular attention is paid to diversity and culture, including race, ethnicity and culture, gender, sexual orientation,age and family structure. Students will receive information and training relative to advanced intervention processes, including engagement, assessment,conducting the specific intervention and evaluation. As part of training in the evidence-based intervention process, students will learn about practice ethics related to working with children and families (e.g., mandated reporting of abuse). This course will focus primarily on conditions that occur first in childhood, including both acute and chronic conditions, and interventions with children and families.

SW 616. Evidence-informed Interventions in Health and Behavioral Health II (Groups, Organizations, Comm). 3 Hours.
The purpose of this course is to train students on providing evidence-based interventions for adults addressing health and behavioral health conditions. Students will be trained in skills in identifying appropriate evidence-based practices, then translating and implementing these practices at appropriate individual, group, family, organization and community levels. Identifying appropriate evidence-based practices will include the ability to ask answerable questions, identify relevant available material, assess the evidence-supporting material, and make evidence-driven decisions based on available information. Translating and implementing practices includes awareness of individual-level information as well as available resources in the various practice settings. In translating and implementing practices, particular attention is paid to diversity and culture, including race, ethnicity and culture, gender, sexual orientation, age and family structure. Students will receive information and training relative to advanced intervention processes, including engagement, assessment, conducting the specific intervention and evaluation. This course will focus primarily on chronic conditions, often with onset in early adulthood (e.g., severe mental illness, substance use disorders, diabetes, HIV) and severe health conditions (e.g., cancer). As part of training in the evidence-based intervention process, students will learn about practice ethics related to working with adults, specifically concentrating on ethics related to older populations (e.g., mandated reporting of abuse). The course will pay considerable attention to interventions with older populations including illnesses associated with aging populations (e.g., Alzheimer's disease) and those associated with normative aging processes (e.g., mourning).

SW 620. Policy Analysis and Advocacy Practice for Health and Behavioral Health. 3 Hours.
This course provides students with necessary knowledge and skills to identify policies at the local, state and federal level relevant to health and behavioral health settings and to analyze the impact of policy on clients and constituent groups. Policy issues are examined in the context of their impact on diverse populations and, particularly, socioeconomic oppression. This course teaches advanced advocacy skills and policy formulation.

SW 630. Research with Health and Behavioral Health Populations I. 3 Hours.
This course provides students with necessary skills to begin to assess, generate, evaluate, translate and implement evidence in clinical and policy practice. Students will become familiar with the evidence-based practice and learn how to implement EBP in health and behavioral health settings. This course introduces students to evaluation methodologies such as single system designs, quasi-experimental and experimental group designs, as well as protection of human subjects and research ethic. Students will also learn how to generate and interpret descriptive and inferential statistics applicable to those designs.

SW 631. Research with Health and Behavioral Health Populations II. 3 Hours.
This course introduces students to evaluation methodologies that include qualitative and mixed-methods designs for implementing and testing clinical and policy practice. Students will learn how to generate and evaluate data including qualitative and quantitative analysis, as well as protection of human subjects and research ethics for these methodologies. This course teaches students how to apply such evaluation to clinical practice in health and behavioral health settings.

SW 640. Human Behavior in the Social Environment for Health and Behavioral Health. 3 Hours.
Students will learn conceptualizations of health and mental health, including historical constructs and current conceptualizations. Students will learn human biology, including brain functions and genetics and epigenetics. Students will be introduced to pharmacology related to health and mental health conditions. Students will be exposed to various constructs of types of diversity, and how they relate to both health and behavioral health. Students will learn about social, economic and environmental justice, and how it relates to both practice and policy. This course will examine how human behavior in the social environment effects the intervention process, including engagement, assessment, intervention and evaluation.

SW 650. Evidence-Based Practice in Mental Health. 3 Hours.
This course will provide students with skills for working with populations coping with mental illness. The course teaches students to move from specific diagnoses, to identifying and implementing evidence-based practices at a variety of levels—including individual, groups, families and organizations. As part of the implementation process, students will learn about the interaction of multiple psychiatric and medical diagnoses, as well as how diversity effects treatment. The course will teach specific skills related to evidence-based practices, such as cognitive behavioral therapy and dialectical behavior therapy.

SW 651. Evidence-Based Practice in Addictions. 3 Hours.
The purpose of this course is to provide advanced skills in treatment of addictions. Evidence-based models will be presented, including motivational interviewing, cognitive behavioral therapy, and psychopharmacologic approaches. Students will receive in-depth training in implementation of evidence-based models, including a specific focus on the skills necessary to identifying and translating the approach for individual clients. Specific attention will be paid to issues around working with diverse populations.

SW 653. Social Work Practice along the HIV Continuum of Care. 3 Hours.
This course is designed to examine the field of HIV/AIDS and will acquaint students with the basic and most advanced facts about HIV/AIDS. It will take different approaches of the impact of HIV infection and AIDS on the individual, family, society, and institutions that provide care and will sensitize students to the challenges that HIV/AIDS has generated in public health, social policy, and social service delivery. The course is especially framed by the HIV Continuum of Care which illustrates related social work HIV practice from prevention and testing to linkage to primary medical care, retention in care, and viral suppression. Social work students will have an opportunity to explore their own beliefs, values and approaches to the issues regarding HIV/AIDS, in addition to the cultural, political, social, legal, ethical, spiritual, and public health issues and the perspectives of people living with HIV infection and AIDS that are needed to inform practice and policy.

SW 654. Health and Well-Being of Black Americans: A Social Work Approach. 3 Hours.
This course uses a social work lens to explore the health and well-being of Black Americans. Course content will examine the historical context of institutional, structural and systemic racism and its impact on education, criminal justice, healthcare, economic, and social systems. Students will engage in experiential learning activities to inform the development of anti-oppressive, social justice informed practices that address systemic inequalities.

SW 655. Exploring Diversity and Social Justice in Social Work Practice. 3 Hours.
This course aims to provide students with knowledge and skills for social work practice with people who are disadvantaged and oppressed, and for taking an active stance against bigotry, intolerance, discrimination, and oppression. People who are oppressed in the U.S. typically include ethnic people of color; women; people with physical and mental disabilities; gay, lesbian, bisexual and transgender people; people with particular religious beliefs; and people who are poor. This course will examine the adaptive capabilities and strengths of people who are disadvantaged and oppressed and how such capabilities and strengths can be used for effective social work practice. Students will explore how their own personal values, beliefs, and behavior may affect their ability to practice social work effectively and ethically with people of diverse backgrounds, particularly with people who are disadvantaged and oppressed. Students should leave this course with a better understanding of themselves, of diverse groups they will be working with in practice, and of strategies for advancing social and economic justice.

SW 690. Field Practicum II. 4-6 Hours.
The first experience of a 900-hour field practicum experience over three semesters in approved social service agencies under the supervision of an MSW with three or more years of experience. As the students' progress through Practicum II-IV they will be expected to function at increasing levels of difficulty, independence, autonomy, initiative,resourcefulness and diligence in the performance of assigned tasks. This course has a weekly one-hour seminar/lab. Students will participate in activities in approved agencies that will allow them to develop advanced generalist practice skills with populations coping with health and behavior health issues. Students will demonstrate knowledge in evidence-based interventions for individuals addressing health and behavioral health conditions and apply that knowledge in conducting interviews and assessments, development of treatment plans, and evaluating their practice. Students will manage personal and professional values and use their understanding of human behavior and diversity to advocate for clients at all systems levels. Course assignments are designed to encourage students to utilize critical thinking to analyze data and formulate plans that will improve practice, policy and service delivery. Seminar/lab sessions will utilize lectures, focused discussion questions and interactive activities to help students integrate classroom knowledge and practice experience.

SW 691. Field Practicum III. 4-6 Hours.
SW 691 Field Practicum (4-6 hours) and Seminar III (1 hour) is the second experience of a 900-hour field practicum experience over three semesters in approved social service agencies under the supervision of an MSW with three or more years of experience. The practicum experience provides the opportunity for social work majors to strengthen and augment knowledge, values and skill bases acquired in the classroom through applying evidence-based theory and other theory-based methods to situations found in actual professional practice. This course has a weekly one-hour seminar/lab. Students will participate in activities in approved agencies that will allow them to develop advanced generalist practice skills with populations copying with health and behavior health issues. Students will demonstrate knowledge in evidence-based interventions for individuals addressing health and behavioral health conditions and apply that knowledge in conducting interviews and assessments, development of treatment plans and evaluating their practice. Students will manage personal and professional values and use their understanding of human behavior and diversity to advocate for clients at all systems levels. Course assignments are designed to encourage students to utilize critical thinking to analyze data and formulate plans that will improve practice, policy and service delivery. Seminar/lab sessions will utilize lectures, focused discussion questions and interactive activities to help students integrate classroom knowledge and practice experience.

SW 692. Field Practicum IV. 4-6 Hours.
SW 692 Field Practicum (4-6 hours) and Seminar IV (1 hour) is the last experience of a 900-hour field practicum experience over three semesters in an approved social service agencies under the supervision of an MSW with three or more years of experience. Each field practicum experience will include a concurrent integrative seminar/lab. The course also provides the opportunity for students to examine the principles of social work practice and to develop critical thinking skills. The practicum experience provides the opportunity for social work majors to strengthen and augment knowledge, values and skill bases acquired in the classroom through applying evidence-based theory and other theory-based methods to situations found in actual professional practice. This course has a weekly one-hour seminar/lab. Students will participate in activities in approved agencies that will allow them to develop advanced generalist practice skills with populations coping with health and behavior health issues. As students progress through Practicum II-IV, they will be expected to function at increasing levels of difficulty, independence, autonomy, initiative, resourcefulness and diligence in the performance of assigned tasks. Students will demonstrate knowledge in evidence-based interventions for individuals addressing health and behavioral health conditions and apply that knowledge in conducting interviews and assessments, development of treatment plans, and evaluating their practice. Students will manage personal and professional values and use their understanding of human behavior and diversity to advocate for clients at all systems levels. Course assignments are designed to encourage students to utilize critical thinking to analyze data and formulate plans that will improve practice, policy and service delivery. Seminar/lab sessions will utilize lectures, focused discussion questions and interactive activities to help students integrate classroom knowledge and practice experience.

SW 693. Field Practicum Seminar II. 1 Hour.
The first experience of a 1080-hour field practicum experience over three semesters in approved social service agencies under the supervision of an MSW with three or more years of experience. As the students progress through Practicum II-IV they will be expected to function at increasing levels of difficulty, independence, autonomy, initiative, resourcefulness and diligence in the performance of assigned tasks. This course has a weekly one-hour seminar/lab. Students will participate in activities in approved agencies that will allow them to develop advanced generalist practice skills with populations coping with health and behavior health issues. Students will demonstrate knowledge in evidence-based interventions for individuals addressing health and behavioral health conditions and apply that knowledge in conducting interviews and assessments, development of treatment plans, and evaluating their practice. Students will manage personal and professional values and use their understanding of human behavior and diversity to advocate for clients at all systems levels. Course assignments are designed to encourage students to utilize critical thinking to analyze data and formulate plans that will improve practice, policy and service delivery. Seminar/lab sessions will utilize lectures, focused discussion questions and interactive activities to help students integrate classroom knowledge and practice experience.

SW 694. Field Practicum Seminar III. 1 Hour.
SW 691 Field Practicum (6 hours) and Seminar III (1 hour) is the second experience of a 1080-hour field practicum experience over three semesters in approved social service agencies under the supervision of an MSW with three or more years of experience. The practicum experience provides the opportunity for social work majors to strengthen and augment knowledge, values and skill bases acquired in the classroom through applying evidence-based theory and other theory-based methods to situations found in actual professional practice. This course has a weekly one-hour seminar/lab. Students will participate in activities in approved agencies that will allow them to develop advanced generalist practice skills with populations copying with health and behavior health issues. Students will demonstrate knowledge in evidence-based interventions for individuals addressing health and behavioral health conditions and apply that knowledge in conducting interviews and assessments, development of treatment plans and evaluating their practice. Students will manage personal and professional values and use their understanding of human behavior and diversity to advocate for clients at all systems levels. Course assignments are designed to encourage students to utilize critical thinking to analyze data and formulate plans that will improve practice, policy and service delivery. Seminar/lab sessions will utilize lectures, focused discussion questions and interactive activities to help students integrate classroom knowledge and practice experience.

SW 695. Field Practicum Seminar IV. 1 Hour.
SW 692 Field Practicum (7 hours) and Seminar IV (1 hour) is the last experience of a 1080-hour field practicum experience over three semesters in an approved social service agencies under the supervision of an MSW with three or more years of experience. Each field practicum experience will include a concurrent integrative seminar/lab. The course also provides the opportunity for students to examine the principles of social work practice and to develop critical thinking skills. The practicum experience provides the opportunity for social work majors to strengthen and augment knowledge, values and skill bases acquired in the classroom through applying evidence-based theory and other theory-based methods to situations found in actual professional practice. This course has a weekly one-hour seminar/lab. Students will participate in activities in approved agencies that will allow them to develop advanced generalist practice skills with populations coping with health and behavior health issues. As students progress through Practicum II-IV, they will be expected to function at increasing levels of difficulty, independence, autonomy, initiative, resourcefulness and diligence in the performance of assigned tasks. Students will demonstrate knowledge in evidence-based interventions for individuals addressing health and behavioral health conditions and apply that knowledge in conducting interviews and assessments, development of treatment plans, and evaluating their practice. Students will manage personal and professional values and use their understanding of human behavior and diversity to advocate for clients at all systems levels. Course assignments are designed to encourage students to utilize critical thinking to analyze data and formulate plans that will improve practice, policy and service delivery. Seminar/lab sessions will utilize lectures, focused discussion questions and interactive activities to help students integrate classroom knowledge and practice experience.

SW 696. Field Practicum V. 4 Hours.
SW 696 Field Practicum (4 hours) and SW 697 Seminar V (1 hour) represents the conclusion of a field practicum experience carried out over four semesters for part-time MSW students. Practica are carried out in approved social service agencies under the supervision of an MSW with three or more years of experience, and the field practicum and integrative seminar/lab must be registered for concurrently. The courses provide the opportunity for students to examine the principles of social work practice and to develop critical thinking skills. The practicum experience provides the opportunity for students to strengthen and augment knowledge, values and skill bases acquired in the classroom through applying evidence-based theory and other theory-based methods to situations found in actual professional practice. As part-time students progress through Practicum II-IV-V, they will be expected to function at increasing levels of difficulty, independence, autonomy, initiative, resourcefulness and diligence in the performance of assigned tasks. Students will demonstrate knowledge in evidence-based interventions for individuals addressing health and behavioral health conditions and apply that knowledge in conducting interviews and assessments, development of treatment plans, and evaluating their practice. Students will manage personal and professional values and use their understanding of human behavior and diversity to advocate for clients at all systems levels. Course assignments are designed to encourage students to utilize critical thinking to analyze data and formulate plans that will improve practice, policy and service delivery. Seminar/lab sessions will utilize lectures, focused discussion questions and interactive activities to help students integrate classroom knowledge and practice experience.

SW 697. Field Practicum Seminar V. 1 Hour.
SW 696 Field Practicum (4 hours) and SW 697 Seminar V (1 hour) represents the conclusion of a field practicum experience carried out over four semesters for part-time MSW students. Practica are carried out in approved social service agencies under the supervision of an MSW with three or more years of experience, and the field practicum and integrative seminar/lab must be registered for concurrently. The courses provide the opportunity for students to examine the principles of social work practice and to develop critical thinking skills. The practicum experience provides the opportunity for students to strengthen and augment knowledge, values and skill bases acquired in the classroom through applying evidence-based theory and other theory-based methods to situations found in actual professional practice. As part-time students progress through Practicum II-IV-V, they will be expected to function at increasing levels of difficulty, independence, autonomy, initiative, resourcefulness and diligence in the performance of assigned tasks. Students will demonstrate knowledge in evidence-based interventions for individuals addressing health and behavioral health conditions and apply that knowledge in conducting interviews and assessments, development of treatment plans, and evaluating their practice. Students will manage personal and professional values and use their understanding of human behavior and diversity to advocate for clients at all systems levels. Course assignments are designed to encourage students to utilize critical thinking to analyze data and formulate plans that will improve practice, policy and service delivery. Seminar/lab sessions will utilize lectures, focused discussion questions and interactive activities to help students integrate classroom knowledge and practice experience.

Sociology

To obtain specific admissions requirements on how to apply to Graduate School, prospective students should visit this page:

http://www.uab.edu/cas/sociology/graduate-programs

Degree Offered:	M.A. in Sociology, Ph.D. in Medical Sociology
Director:	Magdalena Szaflarski, Ph.D.
Phone:	(205) 934-0825
E-mail:	szaflam@uab.edu
Website:	http://www.uab.edu/cas/sociology
Director: Online M.A.	Cullen Clark, Ph.D.
Phone:	(205) 934-3322
E-mail	culclark@uab.edu

Sociology M.A. Program

Prospective students should use website below to obtain specific admissions requirements on how to apply to Graduate School:

http://www.uab.edu/cas/sociology/graduate-programs/online-professional-ma/online-ma-admissions

The Department of Sociology offers two plans (Plan I and Plan II) for the M.A. Degree

Master of Arts in Sociology

The online Applied Sociology M.A. degree (Plan II) provides strong disciplinary training, along with professional and research experience, to prepare students for careers in business, non-profits, government agencies and the continued professional development of teaching

careers. It also offers courses that enable students to apply a sociological perspective to data analytics. To be admitted in good standing, candidates must meet all Graduate School admission requirements.

The Plan II degree is not a step toward obtaining a PhD in Medical Sociology. Students deciding to move into the Medical Sociology Ph.D. Program will need to meet the core requirements from Plan I (refer to Medical Sociology PhD requirements.)

Requirements		Hours
SOC 613	Intro to Applied Sociology Research Methods	3
SOC 623	Applied Sociological Theory	3
SOC 626	Applied Sociology	3
SOC 627	Applied Social Psychology	3
SOC 676	Capstone Project	6
Electives (12 hours):		**12**
SOC 620	Public Sociology	
SOC 628	Teaching Sociology	
SOC 629	Sociology of the South	
SOC 637	Practicum in Innovation, Creativity, and Applied Sociology	
SOC 645	Sociological Practice	
SOC 698	MR Level Non-Thesis Research.	
SOC 714	Survey Research Methods	
SOC 715	Program Evaluation	
SOC 716	Social Stratification	
SOC 718	Social Capital and Social Networks	
SOC 729	Consumer Culture	
SOC 730	Sociology of Education	
SOC 740	Deviant Behavior	
SOC 760	Sociology of Death and Dying	
SOC 783	Health Care Delivery Systems	
SOC 786	Health Disparities	
SOC 792	Seminar in Substantive Sociological Areas	
SOC 794	Special Topics	
Total Hours		**30**

Medical Sociology Ph.D. Program

Prospective students should use website below to obtain specific admissions requirements on how to apply to Graduate School:

http://www.uab.edu/cas/sociology/graduate-programs

Medical Sociology Ph.D. Program

This program is designed to provide students with the coursework and research experiences to become leading researchers, professors and practitioners in medical sociology. Doctoral training in medical sociology exposes students to the central issues of the field through a variety of methodological techniques encompassing both qualitative and quantitative approaches. Graduate students study the social and cultural bases of health beliefs and behaviors, organizational structures of health care delivery, and health disparities, to name just a few examples. Students acquire expertise in theory formulation and data analysis.

There are abundant opportunities for graduate students to work with faculty on research projects in medical settings across the campus.

Admission

Admission to the Ph.D. program in medical sociology generally requires a minimum overall GPA of 3.0 (A = 4.0), or a 3.2 GPA for the last 60 semester hours in a B.A. or B.S. program, and (if applicable) minimum GPA of 3.5 in all previous graduate coursework. Students should have completed at least 18 hours in social science courses, including social theory, statistics, and research methods. GRE is optional, but a minimum expected overall score should be 290, with 150-162 on verbal and 140-157 on quantitative portions. Students entering the program with a master's degree can waive 15 hours of courses, of which 6 credits are thesis research credits. (if a master's thesis was completed for a previous degree and passes muster of this PhD program). Please see the sociology website for more information coming in with a master's degree. Because of the interdisciplinary nature of the Medical Sociology Ph.D. program, students with diverse backgrounds in social science and health-related fields are encouraged to apply. Students lacking adequate backgrounds in theory, research methods, or statistics may be required to make up deficits after enrollment.

Advising

The Graduate Director and/or the student's faculty advisor/mentor will provide continuous advisement on academic progress during the student's graduate study, including assistance with course selection and recommendations for research experiences that are consistent with the student's developing interests and abilities. In addition, each year the student will be formally evaluated by the Graduate Committee and will be provided with performance feedback.

Research supervision is provided by faculty whom students select to chair the master's thesis and doctoral dissertation committees. Typically, the student will select persons with whom a close, supportive relationship develops. Entering graduate students are assigned a temporary faculty advisor that is randomly chosen and are expected to secure a research mentor by fall of the second year in the program.

The placement of Ph.D. students in research sites within the Department and/or in areas across campus is an important part of the Medical Sociology Program. Such placements usually involve assisting faculty on research grants. Such experiences provide students with invaluable real-life exposure to medical sociology "in action." As such, they are important accompaniments to the coursework of the Ph.D. program. Teaching and research positions are offered to students based on department needs, funding available and student merit.

Financial Aid

All students admitted to the Ph.D. program will be considered for financial aid. Sources include graduate fellowships and assistantships.

Additional Information

Deadline for Entry Term(s):	Fall, Spring
Deadline for All Application Materials to be in the Graduate School Office:	Fall: August 1 (regular), January 15 (for funding consideration and international students); Spring: December 1 (regular), June 15 (for international students)
Number of Evaluation/ recommendation Forms Required:	Three
Forms Required:	

Entrance Tests:	GRE is optional (TOEFL, IELTS and TWE also required for international applicants whose native language is not English - see the Graduate School website), https://www.uab.edu/gradadmissions/apply/international-applicants
Ph.D. Program in Medical Sociology	http://www.uab.edu/sociology/

For detailed information, contact Dr. Magdalena Szaflarski, UAB Department of Sociology, HHB 460A, 1401 University Boulevard, Birmingham, Alabama 35294-1152.

Telephone 205-934-0825

E-mail szaflam@uab.edu

Web http://www.uab.edu/sociology/

Curriculum

The components of the Ph.D. program are as follows:

1. Required Coursework

Medical Sociology Core (9 hours)

Required:

Requirements		Hours
SOC 780	Advanced Medical Sociology	3

2 of the following Required Electives:

Requirements		Hours
SOC 724	Body and Health	3
SOC 734	Global Health	3
SOC 755	Race/Ethnicity and Health.	3
SOC 756	Gender and Health.	3
SOC 775	Place and Health	3
SOC 781	Sociology of Health and Illness	3
SOC 783	Health Care Delivery Systems	3
SOC 785	Family and Health	3
SOC 786	Health Disparities	3
SOC 787	Sociology of Mental Health	3

Theory Core (6 hours)

Required:

Requirements		Hours
SOC 720	Classical Theory	3
SOC 722	Contemporary Sociological Theory	3

Statistics and Research Core (15 hours)

Requirements		Hours
SOC 601	Data Management and Analysis	3
SOC 703	Regression Analysis	3
SOC 704	Categorical Data Analysis	3
SOC 705	Advanced Research Methods	3
SOC 711	Qualitative Methods	3

Research Hours

(required by The University)

Master's Thesis Research Hours (6 hours)
Doctoral Dissertation Research Hours (24 hours: 12 hours must be SOC 799 and remaining 12 hours can be SOC 799, SOC 798, or approved research methods courses)

Sociology/Health/Methods Electives/Transfer Credits

Entering with a Bachelor's degree: 24 hours Sociology/Health/Methods electives*

Entering with Master's degree: 15 hours Sociology/Health/Methods electives*

Entering with Master's degree, thesis required: 9 hours Sociology/Health/Methods electives if not seeking a Master's in Sociology degree; 15 hours Sociology/Health/Methods if seeking a Master's in Sociology degree on the way to PhD*

GRD 717 **Responsible Conduct of Research** requirement by the university (3 hours); counted as an elective.

Proseminars (3 hours)

Proseminar, SOC 702 - 1 hour Fall Research
Proseminar, SOC 702 - 1 hour Spring Professionalization
Proseminar, SOC 702 - 1 hour Summer Teaching

Sociology/Health/Methods electives*: SOC 706, SOC 707, SOC 714 through SOC 718, SOC 724 through SOC 778, SOC 781 through 794, GRD 776, PY 704, PY 716 (incl. PY 716L), PY 718, PY 719 (incl. PY 719l), PY 727, PY 729, PY 731, PY 737, PY 746, HB 701, HB 703, HB 707, HB 712, HB 715, HB 716, HB 724, HB 730, HB 733, HB 736, HB 737, HB 741, HB 742, HPO 703, HPO 704, HPO 717, HPO 728, HPO 777, HPO 787, HPO 792, PUH 703

*Students may take up to 3 SOC 790-793 classes for credit as electives.

*Students may take up to 2 online courses towards their degree. Additional Sociology online courses may be approved if they are research methods courses.

*Students may take up to 2 approved external (non-sociology) electives towards their degree.

2. Graduate Proseminar Functions

The graduate proseminar series (SOC 702) is required of all entering doctoral graduate students for their initial three terms in the graduate program. These classes familiarize new students with departmental policies and procedures, as well as various facets of the profession of sociology. This series should not only help students become situated within the graduate program, but also give them an opportunity to become better acquainted with the faculty and graduate student body. Students should also gain experience with basic professional skills such as identifying appropriate journals, creating a curriculum vitae, identifying one's own research interests, developing basic classroom skills, and addressing ethical issues associated with the profession of sociology.

3. The Master's Thesis

Students pursuing the doctoral degree must follow Plan I (Thesis Plan) of the existing master's degree program by producing a research-based thesis, but two types of documents will be acceptable. The first is a

traditional thesis organized in the form of an extensive book monograph. This option is especially appropriate for qualitatively based research.

The second acceptable type of document is a manuscript in the standard form of a journal article with appended materials. Specifically, this journal article thesis will consist of:

1. A journal article manuscript with a text no longer than the page limitations of a journal selected by the committee, plus footnotes, references, tables, and figures;
2. An appendix that fully presents, the methodological procedures;
3. An appendix of measurement instrumentation (e.g., survey instruments, in-depth interview schedules, observational logs, etc.);
4. An appendix of additional tables and/or samples of observational notes;
5. An appendix of other research documentation such as survey cover letters, human subject review approval forms, and letters of support and approval from facilities at which the research was conducted.

The master's thesis process involves:

1. Formation of the thesis committee;
2. Oral defense of a written thesis research proposal;
3. Oral defense of the completed thesis;
4. Submission of the completed manuscript to the Graduate School,
5. Submission of the journal article for publication.

The thesis committee consists of a minimum of three full-time faculty members, including one from outside the Department of Sociology. This committee will be responsible for guiding the research process, evaluating the final draft of the thesis, presiding over the oral defenses of the thesis proposal and the completed manuscript, and approving the journal article for submission for publication. In addition to meeting general M.A. degree requirements, before being admitted to candidacy for the M.A. degree, a student in the Ph.D. program in Medical Sociology must have completed the master's level core course in theory (SOC 722) and the core methods courses (including SOC 601 or SOC 703 and SOC 704 and SOC 705 or SOC 711), completed two courses in the medical sociology core, and made a successful oral defense of the thesis proposal.

For those students entering with a master's degree, the graduate director will review the student's transcript, evaluate course transfers (if any), and devise a course plan. This student's doctoral advisory committee also will handle the student's admission to candidacy and the requirement of submitting a journal article for review. The student with the master's degree will not be required to make oral defenses of his/her thesis work from another institution.

4. Comprehensive Examination Policy

Exam Description

The comprehensive exam is a take-home exam that requires you to answer 4 out of 5 questions related to major theoretical, methodological, and substantive issues in medical sociology and a chosen specialty area. Your specialty area must be a combination of health and one substantive area reflecting the specialties of our department (e.g., health disparities, aging and health, health behaviors, health and demography, etc.). There is no oral examination.

Developing a Readings List

The comprehensive exam committee will use your reading list to create exam questions related to your chosen specialty area and medical sociology more broadly. This means that successfully completing your comprehensive exams will require you to work with your faculty advisor and the exam committee to develop a readings list. You should aim to have your list approved by your committee and advisor (if not in the committee) by the 2nd week of the semester preceding the one when you wish to take your exam.

Readings lists range between 100 to 125 published papers, including peer-reviewed articles, literature reviews, and books. Your list must draw from your coursework, major works in medical sociology, the department's required readings list, and key scholarship from your chosen specialty area. Ideally, your readings list should include one or more sections directly related to your dissertation. Reading lists are public and can be shared in the department.

The Comprehensive Exam Committee returns their first set of revisions for the list or their approval within 2 weeks of receiving the list. Faculty and student work together until the list is accepted. However, faculty can **NOT** approve student work during the summer.

Exam Preparation

Preparation is absolutely critical to passing your exams. We expect all students to take initiative and use the resources provided by the department to prepare for the exam. The main office has a file with old lists and test questions. Students are encouraged to use these lists and exam questions/answers to prepare. The best exams are written by students who have organized their notes and spent time writing answers to common exam questions.

Taking the Exam

The student will answer four of five questions as a take-home exam. The exam is distributed at 4:00 p.m. on Friday and is due the following Monday at 9:00 a.m. While taking your exam, you may not discuss it with anyone other than the comprehensive exam committee. You are encouraged to use any notes or practice answers you have prepared.

Comprehensive Exam Committee

The comprehensive exam committee will consist of three faculty members selected on a rotating basis by the Graduate Committee. One faculty will head the committee and make sure the questions are distributed and answers received. They will also notify the Graduate Director of the outcome. The Graduate Director is not a member of the Comprehensive Exam Committee.

5. The Doctoral Dissertation

The dissertation process is as follows:

1. Formation of the dissertation committee;
2. Oral defense of a written dissertation research proposal;
3. Oral defense of the completed dissertation;
4. Submission of the completed manuscript to the Graduate School.

In consultation with faculty, and near the completion of all substantive coursework, a student forms a dissertation committee consisting of at least five members: 3 from the Department of Sociology, 1 from outside the Department of Sociology, and 1 either from the Department of Sociology or from outside of the Department of Sociology. This committee will be responsible for guiding the research process, evaluating the final draft of the dissertation, and presiding over the oral defenses of

the dissertation proposal and the completed manuscript. A student is admitted to candidacy after successful oral defense of the dissertation proposal and no earlier than the term in which the required substantive coursework is completed.

Graduate Certificate in Social & Behavioral Statistics

The Graduate Certificate in Social & Behavioral Statistics is available to students currently enrolled in a Graduate Program who have a 3.0 GPA or higher.

Requirements		Hours
SOC 707	Statistical Programming for Social Sciences	3
Advanced Statistics Courses [1]		**12**
PY 719	Multivariate Statistical Methods	
or PY 719L	Lab for Multivariate Statistical Methods	
PY 727	Longitudinal Data Analysis Laboratory	
or SOC 70(	Advanced Longitudinal and Multi-level Data Analysis	
PY 746	Structural Equation Modeling	
SOC 704	Categorical Data Analysis	
Total Hours		**15**

[1] Other advanced statistics electives may be approved by the Program Director

Contact

Program Director	Sylvie Mrug, Ph.D.
E-mail	smrug@uab.edu

Courses

SOC 503. Regression Analysis. 3 Hours.
Multivariate Statistical Analysis.
Prerequisites: SOC 410 [Min Grade: A]

SOC 601. Data Management and Analysis. 3 Hours.
An introduction to statistical theory and univariate and bivariate statistics.

SOC 613. Intro to Applied Sociology Research Methods. 3 Hours.
Overview of methodologies used in applied social science research; major emphasis includes components of the research process, problem conceptualization, research design, measurement, sampling, questionnaire development, modes of data collection, and ethical issues in both quantitative and qualitative research.

SOC 620. Public Sociology. 3 Hours.
Explores the role and potential of sociologists and social research as instruments of social change and policy; examines techniques for communicating with the public about concepts and advances in sociology as well as the importance of doing so.

SOC 623. Applied Sociological Theory. 3 Hours.
Overview of classical and selected contemporary social theorists with an emphasis on the relevance of their work to applied sociology.

SOC 626. Applied Sociology. 3 Hours.
An overview of the field of applied sociology with special attention to current trends and issues in the application of social science in both for-profit- and not-for-profit sectors.

SOC 627. Applied Social Psychology. 3 Hours.
Examination of how social psychological theory and evidence are applied to understanding and addressing social and practical problems on such topics as health, education, criminal justice, community, environment, and diversity.

SOC 628. Teaching Sociology. 3 Hours.
Development of practical strategies and skills to improve classroom techniques for teaching sociology in a way that awakens the sociological imagination of students.

SOC 629. Sociology of the South. 3 Hours.
The contemporary American South is a region of fascinating contrasts. This course examines different facets of the Southern experience from a sociological perspective, exploring the social forces that have shaped the region. This course makes extensive use of digital resources and experiential learning as well as conventional texts and reading assignments.

SOC 637. Practicum in Innovation, Creativity, and Applied Sociology. 3 Hours.
Directed activities that emphasize research is a creative endeavor and allow students to develop innovative ways to apply social sciences to challenges faced by society, business, and government. Prerequisites: SOC 613 [Min Grade: C] or SOC 714 [Min Grade: C] or permission of instructor.
Prerequisites: SOC 613 [Min Grade: C] or SOC 713 [Min Grade: C] or SOC 714 [Min Grade: C]

SOC 645. Sociological Practice. 3 Hours.
Advancing sociologically-informed research and practice, to further public discussion of sociological issues and promote the use of sociology to inform public policy.
Prerequisites: SOC 623 [Min Grade: C] or SOC 626 [Min Grade: C]

SOC 676. Capstone Project. 6 Hours.
A faculty-directed research project, undertaken at the conclusion of the online M.A. in Applied Sociology program that provides an opportunity to synthesize all previous course materials.

SOC 698. MR Level Non-Thesis Research. 1-12 Hour.
Integration of theory and research methods: synthesis of data into well-written report derived from research activities.
Prerequisites: GAC M

SOC 699. Thesis Research. 1-12 Hour.
Thesis Research.
Prerequisites: GAC M

SOC 702. Proseminar: The Profession of Sociology. 1 Hour.
The culture and organization of sociology; norms and values of the graduate student culture and the profession; the sociological imagination; sociological careers; the practice of sociology; thesis development. Designed to orient the student to the perspective and practice of sociology. Required of all beginning graduate students.

SOC 703. Regression Analysis. 3 Hours.
Bivariate and multivariate statistical analysis.
Prerequisites: SOC 601 [Min Grade: C]

SOC 704. Categorical Data Analysis. 3 Hours.
Introduction to the most fundamental regression models for binary, ordinal, nominal, and count outcomes with an emphasis on post-estimation strategies.
Prerequisites: SOC 703 [Min Grade: C]

SOC 705. Advanced Research Methods. 3 Hours.
The logic of social inquiry and overview of different types of quantitative research designs, with emphasis on issues in observational designs. Crafting research proposals.
Prerequisites: SOC 703 [Min Grade: C]

SOC 706. Advanced Longitudinal Data Analysis. 3 Hours.
Applied approaches to the study of longitudinal change and events using panel data. Topics include fixed effects models, growth curve/mixed models, and event history analysis. Techniques for handling missing data. Proficiency in Stata required.
Prerequisites: (SOC 703 [Min Grade: C] or PY 719 [Min Grade: C]) and SOC 704 [Min Grade: C]

SOC 707. Statistical Programming for Social Sciences. 3 Hours.
Introduction to statistical programming for quantitative researchers interested in developing a workflow that ensures reproducible results.

SOC 711. Qualitative Methods. 3 Hours.
Benefits of a qualitative research approach. Designing a qualitative research project. Ethical issues in qualitative research. Strategies for in-depth interview and ethnographic studies, content analysis, and visual methods. Coding and analyzing qualitative data. Writing and publishing qualitative research.

SOC 714. Survey Research Methods. 3 Hours.
Survey design, sampling, instrumentation, data collection and analysis, and report writing.
Prerequisites: SOC 613 [Min Grade: C] or SOC 713 [Min Grade: C]

SOC 715. Program Evaluation. 3 Hours.
Topics associated with the use of social sciences to evaluate programs, including appropriate measures of quality; selection of evaluation methodology; accuracy, reliability, and validity of measures.

SOC 716. Social Stratification. 3 Hours.
Theories of inequality; race and ethnic inequality, gender inequality, and international inequality.

SOC 718. Social Capital and Social Networks. 3 Hours.
Interrelationship between social capital and social networks; how social structure arises from interdependence of actors and then affects individual actors; important research findings; research methods used to study social networks and social capital; and critiques of social capital theory.

SOC 720. Classical Theory. 3 Hours.
An examination of sociological theory from its philosophical roots to post-modern theories of self and society.

SOC 722. Contemporary Sociological Theory. 3 Hours.
Review of late 20th century and 21st century sociological theories and issues.

SOC 724. Body and Health. 3 Hours.
Seminar focused on examining how the body is socially constructed and understood within medical sociology.

SOC 729. Consumer Culture. 3 Hours.
An exploration of theoretical understandings of consumer culture from Georg Simmel to Jean Baudrillard and their application to consumer research.

SOC 730. Sociology of Education. 3 Hours.
Survey of sociological insights into - and influences upon - education, including topics such as social historical development of education; theories on how education reproduces or changes one's social status; evidence of inequality in educational outcomes; debates on contemporary education policy; and effects of education over the life course.

SOC 731. Health Disparities among Children and Adolescents. 3 Hours.
Seminar focusing on socioeconomic and race/ethnic differentials in the health and well-being of infants, children, and adolescents, as well as the policies and programs aimed at improving children's health and reducing disparities. This class will draw on the scholarly literature in the interrelated fields of demography, public health, health policy, and sociology.

SOC 734. Global Health. 3 Hours.
Sociological perspectives on global health issues; global health disparities.

SOC 740. Deviant Behavior. 3 Hours.
Contemporary sociopsychological theories of deviant behavior; recent empirical findings.

SOC 743. Religion and Health. 3 Hours.
The effects of religion, spirituality and religious life on mental and physical health.

SOC 755. Race/Ethnicity and Health. 3 Hours.
Seminar focusing on social and behavioral aspects of physical and mental health that center on the intersection of race-ethnicity and other social determinants of health in the United States.

SOC 756. Gender and Health. 3 Hours.
Review of changes in gender research over time. Theories of gender from earlier work on essentialism and gender stratification, to the social construction of genders, gender identity and queer theory. Research on gender and health.

SOC 759. Aging and the Life Course. 3 Hours.
The study of aging and older adulthood, life expectancy and health, inequalities in aging, caregiving, and how early life experiences affect later life outcomes.

SOC 760. Sociology of Death and Dying. 3 Hours.
Sociological, social psychological and existential perspectives on death and dying; recent trends in definition, distribution, and practices surrounding death and dying.

SOC 761. Sociology and Neuroscience. 3 Hours.
Sociological perspectives on neurosciences; neuroscience as culture; social neuroscience: brain, mind, and society.

SOC 770. Techniques of Population Analysis. 3 Hours.
Composition of population; constructing life tables; population estimation and projection; migration.

SOC 772. Medical Demography. 3 Hours.
Quantitative assessment of health status of populations in clinical, epidemiological, and sociological studies; interrelationships of health with population structure and dynamics. Modeling preventive health strategies.

SOC 775. Place and Health. 3 Hours.
Spatial patterns of health across urban and rural places and their effects on behavior and social structure.

SOC 777. Demography of Health and Aging. 3 Hours.
Focus on demographic processes, such as mortality, morbidity, migration, and fertility; how each influences number and proportion of older adults; how such processes shape age/sex structure; other demographic characteristics of older people.

SOC 778. Demography. 3 Hours.
Effect of population processes such as birth, death, migration, and marriage on growth, decline, composition, and distribution of population.

SOC 780. Advanced Medical Sociology. 3 Hours.
Theory and research in medical sociology; systematic overview of relevant literature.

SOC 781. Sociology of Health and Illness. 3 Hours.
Focuses on theories, research methods, and empirical examples in the sociological study of health and illness.

SOC 783. Health Care Delivery Systems. 3 Hours.
Sociological study of the ways that healthcare is organized and delivered in the U.S. and around the world.

SOC 785. Family and Health. 3 Hours.
How family structures and family processes affect health outcomes. Family theories are introduced and applied to current family and health research. Examination of families and inequality.

SOC 786. Health Disparities. 3 Hours.
Prevalence, causes, and consequences of health and mental health problems for special populations, such as homeless, poor, African-Americans, and others; service delivery systems.

SOC 787. Sociology of Mental Health. 3 Hours.
Foundational review of the theoretical, methodological, and substantive issues that shape research in the sociology of mental health. Biomedical, psychological, and sociological perspectives on mental health are examined from a critical lens.

SOC 788. Sociology in Medicine. 3 Hours.
Application of sociological theory and methods in medicine and other health fields. Critical review of current medical and public health research that engages sociological perspectives and methods.

SOC 789. Patient Care Relations/Ethics. 3 Hours.
Issues shaping content and quality of patient care; special significance of practitioner-patient-family triad; broad sociocultural and political economic forces affecting medical practice, and creating moral dilemmas.

SOC 791. Seminar in Substantive Sociological Areas. 1-3 Hour.

SOC 792. Seminar in Substantive Sociological Areas. 1-3 Hour.

SOC 793. Seminar in Substantive Sociological Areas. 1-3 Hour.

SOC 794. Special Topics. 3 Hours.
Special Topics.

SOC 798. Non-Dissertation Research. 1-12 Hour.

SOC 799. Dissertation Research. 1-12 Hour.
Research for Graduate Student.
Prerequisites: GAC Z

World Languages and Literatures

http://www.uab.edu/languages

Chair: Julian Arribas

The Department of World Languages and Literatures offers multifaceted French and Spanish graduate-level courses which, in tandem with the offerings in the School of Education, address the diverse global and intellectual challenges facing future educators and citizens of the 21st century.

Whether at the undergraduate or at the graduate level, our programs are rooted in diversity within and across cultures. We foster the international exchange of knowledge and information between humanities scholars, teachers and other professionals. Our instructional methods are aligned with national standards. The foreign language experience at UAB includes classroom learning, scholarship and research, experiential learning, and extracurricular opportunities. We offer graduate students a unique opportunity to interact with scholars and engage as well with faculty dedicated to serving their profession. Our UAB World Languages and Literatures faculty are engaged in their state and/or national professional teaching associations, serving on boards, organizing professional workshops, working every day to build connections and to enhance foreign language education opportunities in our state and beyond.

At the graduate level the UAB Department of World Languages and Literatures offers courses in culture, civilization, cinema and culture studies, linguistics, and literature.

For more information, visit the Department of World Languages and Literatures web site at http://www.uab.edu/cas/languages/.

World Language Graduate Studies

M.A. in Education (French/Spanish)

At UAB, the Master of Arts in Education (MAEd) program for the teaching of World Languages (French and Spanish) consists of two tracks —traditional and alternative. The traditional track is for prospective students who completed an undergraduate degree in French or Spanish education, who already hold certification for teaching French or Spanish, and who wish to earn advanced certification. The alternative track is for prospective students who have an undergraduate degree with a 2.75+ GPA from a regionally accredited college, have passed the ETS Core Academic Skills Exam and the Praxis in French or Spanish, and who wish to earn initial certification for teaching French or Spanish in grades PK-12.

Information sessions are offered on a weekly basis. Confirm your attendance by contacting Dr. Susan Spezzini (spezzini@uab.edu), Program Director for Secondary and K-12 programs. These information sessions take place as follows:

Alternative Master's	Mondays at 5:00 in EB 100
Traditional Master's	Thursdays at 4:00 in EB 100

For advising in World Language Education, contact:
Dr. Krista Chambless (kristachambless@uab.edu), Advisor for World Language Education

FR-French Courses

FR 501. Histoires de France: French History Through Stories. 3 Hours.
Literature, culture, and civilization of seventeenth and/or eighteenth-century France reflecting the historical and literary ambience in which Ancient Regime writers, philosopies, and artists worked. Selected works of representative authors. Conducted in French.

FR 502. Aux Armes! Revolutions in the French-speaking World. 3 Hours.
This course reflects on the major revolutions that occurred in the 18th and 19th century, illustrating the impact of the French Revolution on the history and thought of Europe and the Americas. Conducted in French.

FR 503. Fin-de-Siecle France (1895-1940). 3 Hours.
Major authors and art movements of fin-de-siecle France from La Belle Epoque period through World War I. Selected works of representative authors. Conducted in French.

FR 504. French Literature since 1940. 3 Hours.
Cultural trends and literary movements from World War II to the present, including existentialism and the nouveau roman. Selected works of representative authors. Conducted in French.

FR 505. Race, Gender, and Transnationalism in Francophone Literature and Thought. 3 Hours.
French-speaking literature outside France that developed through colonization, decolonization, independence, sexuality, marriage, exile and emigration. Representative writers from Francophone countries with emphasis on Africa and the Caribbean. Selected works of representative authors. Selections will vary according to instructor. Conducted in French.

FR 510. Special Topics in French. 3 Hours.
Seminar on individual authors, specific genres, important literary movements, or literary discourse/theory. Selections will vary according to instructor. May be repeated for credit. Conducted in French.

FR 512. French Civilization: Pre-Revolutionary. 3 Hours.
Historical and cultural foundation of France from the conquest of Julius Caesar to the French Revolution. Conducted in French.

FR 513. French Civilization: Post-Revolutionary. 3 Hours.
The history and myths of France after the French Revolution that produced French civilization.

FR 521. Literature and the Environment in the French-Speaking World. 3 Hours.
This course examines the poetics of the environment, known as ecopoetics, in the 20th- and 21th-century literary and cultural productions of the Francophone world, notably France, the Caribbean and Africa. It explores how francophone poets, fiction writers and philosophers write and think about the environment in relation to tradition, memory, sexuality, law, poverty and global capitalism. This course pays particular attention to the role of the environment as a space to discuss historical and cultural events, ranging from colonization to the Anthropocene. Students will discuss French-language theories of ecocriticism and examine the many voices of French-language literature that incorporate the environment in their works. Conducted in French.

FR 590. Study Abroad. 1-6 Hour.
Approved program in a French-speaking country.

FR 599. Individual Studies. 3 Hours.
Individual studies.

SPA-Spanish Courses

SPA 501. Voices of Imperial Spain. 3 Hours.
Culture and civilization of Imperial Spain from the age of the Catholic Monarchs to the close of the Hapsburg Dynasty (1469-1716). Includes a study of the art, historical documents and literature from both the center and periphery of the Empire. Selected works by representative authors will vary according to instructor. Conducted in Spanish.

SPA 502. Voices of Colonial Latin America. 3 Hours.
Culture and civilization of Colonial Latin America from the advent of European dominance to the decades following the Spanish American War (1492-1920). Emphasis on the blending of Spanish, Amerindian, and African cultural forms and their diverse literary expressions. Selected works by representative authors will vary according to instructor. Conducted in Spanish.

SPA 503. Contemporary Spanish Literature and Film. 3 Hours.
Cultural and literary trends of Spain from the transformation of Spanish Society in the late-nineteenth century to the post-Franco era. Focus on impact of the Spanish Civil War.

SPA 504. Medicine and Literature in the Spanish-Speaking World. 3 Hours.
How does literature help us to understand the relationship between medicine, culture, and politics? This class, which seeks answers and related questions, focuses on the role of medical science in literary and cultural texts from Latin American countries, Spain, and the United States. Students will read short stories, poems, novel excerpts, and essays, and they will interpret films and visual art to discuss how science and the humanities supplement one another to create a richer understanding of the human body and its role in the historical development of Europe and the Americas. Graduate Students will have assignments beyond undergraduates and projects tailored to high school teaching. Offered in Spanish.

SPA 505. US Latino Writers. 3 Hours.
Literary trends of Spanish-speaking cultures within the borders of the United States. Focuses on discourse of exile, migration, bilingualism, and hybridity.

SPA 507. Indigenous and Indigenist Latin America. 3 Hours.
Cultural and literary forms of Amerindian, Hispanic or mixed decent writers of Latin America. Focus on the concepts of hybridity, syncretism and mestizaje.

SPA 509. Spanish-Speaking Nobel Laureates. 3 Hours.
This course offers a survey of the Hispanic authors who have been awarded the Nobel Prize in Literature since the award's founding in 1901, including Gabriela Mistral (1945), Pablo Neruda (1971), Gabriel García Márquez (1982), Camilo José Cela (1989), and Octavio Paz (1990). The panorama includes critical discussions and reflections on the writing of these authors. Conducted in Spanish.

SPA 511. Cervantes and the Quixote. 3 Hours.
This course will review the major episodes of Don Quixote de La Mancha, one of the most influential works of Spanish and World literature, as well as other selected works written by Cervantes. Emphasis will be given to the author's unique contribution to the birth of the modern novel and his ingenuity to create stories that transformed all literary genres. These readings will be analyzed within the civilization of the Golden Age of Spain, while exploring a diverse array of topics, such as: love and marriage, religion, race, class, magic, madness, and honor. Conducted in Spanish.

SPA 512. Voices of Contemporary Latin America, 1920-Present. 3 Hours.
Cultural and literary trends of Latin America from la nueva narrativa through the Boom and post-Boom periods. Focus on Mexico, Northern Latin America, and the Southern Cone.

SPA 514. Afro-Latin American Literature and Culture. 3 Hours.
The diverse cultures of many Latin American nations will be discussed with a focus on the descendants of Africa in the Americas. Slavery will be discussed during the colonial and independence periods. Black identity and cultural forms will be discussed through the writers, musicians, and filmmakers of the twentieth and twenty-first centuries. Parallels and connections will be drawn to race and history in the United States. Conducted in Spanish.

SPA 516. Special Topics in Spanish. 3 Hours.
Seminar on specific Spanish-speaking regions, individual authors, specific genres, literary movements, music, films, the arts, or transatlantic cultural studies. May be repeated for credit. Course conducted in Spanish.

SPA 520. Introduction to Hispanic Linguistics. 3 Hours.
This advanced Spanish linguistics course is intended to analyze, clarify and expand upon critical aspects of the Spanish language. The course will provide a general understanding of the Spanish sound system (phonetics and phonology), morphology and syntax, as well as an introduction of relevant topics within the field of Hispanic linguistics.

SPA 530. Spanish Sociolinguistics. 3 Hours.
This advanced Spanish linguistics course provides a general overview of sociolinguistics and the pragmatics of oral communication in Spanish. This course studies the Spanish language in its social context. In addition to specific regional linguistic features, social factors such as geography, social class, politics, race, gender, economics, education and history are discussed as determiners of the linguistic landscape.

SPA 540. History of Spanish Language. 3 Hours.
This advanced Spanish linguistics course provides a general overview of the evolution of Spanish language, while relating it to relevant historical events. It pays special attention to diachronic change in order to understand the phenomenon of language variation in a multicultural society.

SPA 550. Spanish Second Language Acquisition. 3 Hours.
This course describes the cognitive, developmental and linguistic processes involved in the acquisition of Spanish as a second language while exploring the basic research techniques used in the field.

SPA 555. Pop Culture in Translation. 3 Hours.
This course aims at further developing students' proficiency in the language as well as an understanding of the process of translation through translation from English into Spanish and vice versa. Students will develop their translation skills through a number of activities translating cartoons, popular songs, professional documents, and slam poetry. Students will also increase their theoretical understanding of the translation process from a linguistic point of view. This course involves a translation project originated and connected with the professional needs of the Birmingham area and beyond. Offered in Spanish.

SPA 560. Globalization in the Hispanic World. 3 Hours.
This graduate-level course develops a constructivist framework for the study of contemporary globalization issues in the Hispanic world by engaging students in higher-level discussions and critical thinking. Through films, music and literature, and guided research, course explores history, politics, economics and sociocultural issues of the recent Spanish-speaking world. Conducted in Spanish.

SPA 561. Contemporary Spain. 3 Hours.
This graduate-level course develops a constructivist framework for the study of contemporary Spain by engaging students in higher-level discussions and critical thinking. Through films, music and literature, and guided research, course explores recent Spanish history, politics, economics and sociocultural issues. Conducted in Spanish.

SPA 562. Contemporary Latin America. 3 Hours.
This course develops a constructivist framework for the study of contemporary Latin America by engaging students in higher-level discussions, critical thinking, and active learning. Through films, music and literature, and guided research, course explores recent Latin American history (late 20th and 21st centuries), politics, economics and sociocultural issues and their global impact. Course conducted in Spanish.

SPA 580. Applied Spanish and Medical Interpreting. 3 Hours.
This graduate course blends an academic curriculum on Spanish for healthcare and medical interpreting with a semester-long service-learning project where students will work with a community partner and apply course materials to real-life situations pertaining the health of Latinos. Upon successful completion of this course, students will have satisfied the medical interpreting training required to take the medical interpreting examinations offered by the two certification organizations in the area (CCHI and NBCMI). Conducted in Spanish.

SPA 585. Spanish for Leadership at the Workplace. 3 Hours.
SPA 585 Spanish for Leadership at the Workplace is a graduate-level Spanish course which provides an opportunity for applied professional Spanish through experiential learning by requiring a practical experience locally or abroad. The main goal is to explore and transform the community's linguistic landscape in order to make public spaces more accessible, inclusive and welcoming to the Spanish-speaking community. Students may: (1) work with assigned Community Partners; or (2) complete their project at their own workplace whenever possible. Course conducted in Spanish.

SPA 590. Study Abroad. 1-6 Hour.
Fifth-year level of approved program in a Spanish speaking country.

SPA 599. Independent Studies. 3 Hours.
Individual studies in Spanish.

Joint Health Sciences

Joint Health Sciences offers interdisciplinary M.S. and Ph.D. programs including:

- M.S. in Anatomical Science (p. 166)
- Ph.D. programs in Graduate Biomedical Sciences (p. 167)
- M.S. in Multidisciplinary Biomedical Science
- Ph.D. program in Neuroengineering (p. 189)

ANSC-Anatomical Science Courses

ANSC 601. Human Gross Anatomy. 4 Hours.
Course provides a comprehensive survey of the gross anatomy of the human along with functional and applied anatomy as it relates to common clinical findings.

ANSC 601L. Human Gross Anatomy Lab. 1 Hour.
Lab component of Human Gross Anatomy.

ANSC 602. Gross Anatomy Supplement. 1 Hour.
This course provides students with a step-by-step guide to beginning an education-based research project. Students will create their own anatomy education research project following the topics in the course. Topics include: ethics of research, IRB documents, writing a research question and hypothesis, designing a survey, identifying a sample population, reviewing existing literature, appropriate use of statistical tests, and more.

ANSC 618. Histology of Mammalian Organ Systems. 3 Hours.
This course will cover the specialized cell biology and microscopic anatomy for each of teh mammalian organ systems, as well as consider current research with regards to each system. The objective is to understand how cells organize into tissues and organ systems and how these systems function in the body, as well as appreciate the microscopic appearance of cells, tissues and organs.

ANSC 655. Neuroscience. 3 Hours.
Have you every wanted to know where the amygdala sits in the brain, or how the brainstem connects to the thalamus and basal ganglia? Would you like to know about processing in the spinal cord, and how this information is sent to and from the cortex? This course will show you how to find any structure in the nervous system, and how these regions interact to control body movements, give rise to sensory perception, generate emotions and experiences, make decisions, and create personality. Each week will use interactive didactic sessions, anatomical drawing exercises, real brain lab experiences, radiographic imaging, and small group medical case discussions, to break down the brain into manageable components, to see how its outer coverings, blood supply, gray and white matter are structurally and functionally organized to make you who you are. This course may be beneficial for students considering careers in the medical, dental or optometry fields, along with those wanting to pursue graduate research in neuroscience. Students without a general neuroscience background may consider taking NBL 230 or PY 253 (recommended but not required).

ANSC 656. Human Embryology. 2 Hours.
This course uses didactic lectures, lab exercises and student presentations to help students gain an understanding of the major events in human development from gastrulation to birth. Individual units focus on the developmental processes of specific organ systems. the course uses an anatomical focus to describe the morphological characteristics of the developing embryo/fetus. The biochemical and molecular biology of development are only briefly discussed. morphology and anatomy are also related to clinical presentation of birth defects. Offered summer terms.

ANSC 657. Medical Imaging. 1 Hour.
Students will learn to obtain and interpret ultrasound images by practicing techniques on classmates and reading existing ultrasound images. Other radiograph images (X-ray, MRI) will also be used to help students understand planar anatomy and its relationship to 3D anatomy. Students will learn the basics of the technology behind the different medical techniques to provide a fuller understanding of image interpretation.

ANSC 695. Teaching Practicum. 3 Hours.
Students will act as supplemental instructors in a variety of anatomy lab courses, complete their own (or in teams) whole-body prosection, and prepare and present 2-3 hours of new lecture content for anatomy.

ANSC 696. Research Project. 1-6 Hour.
Students will develop an original research project in medical education, clinical anatomy, or other anatomy research. Students will be evaluated on their ability to formulate an anatomically relevant research question, review the existing literature, and communicate their findings via a poster or oral presentation to department.

ANSC 697. Special Topics: Anatomy. 2 Hours.
Students will read and discuss current literature in anatomy education.

GGSC - Genetics Genomic Sci Courses

GGSC 610. Genetic Basis of Human Disease. 3 Hours.
This course will focus on the medical applications of genetics and genomic technologies. Topics covered include, but are not limited to major forms of chromosomal abnormalities, mutations and genetic disorders, genetic risk assessment and population genetics, and genomic approaches to diagnosis.

GGSC 615. Aquatic Animal Models of Human Disease. 3 Hours.
This course will cover the basic anatomy, biology, life history, husbandry, and research applications for a variety of aquatic organisms used as animal models of human disease in biomedical research. Species discussed will include zebrafish, Medaka, Xiphorous, Onchorynchus, Xenopus, and Axolotls.

GGSC 620. Applications of Bioinformatics. 3 Hours.
Introduction to computational tools and bioinformatics databases used in the fields of genetics and genomic sciences. This course will cover a wide variety of different bioinformatics applications, which will be taught through use of available on-line bioinformatics resources. Topics covered include large-scale genomic databases, sequence analysis systems, protein sequence analysis, structural bioinformatics, protein folding, and homology modeling.

GGSC 635. Zebrafish as a Model for Biomedical Research. 3 Hours.
This course will focus on the biology, husbandry, and management of zebrafish used as an animal model of human disease in biomedical research. The course is suitable for undergraduate and graduate students. Topics will include anatomy, physiology, systems design, water quality management, behavior and enrichment, spawning and larviculture, nutrition and live feeds, diseases, quarantine, biosecurity, and regulatory compliance.

GGSC 650. Special Topics in Genetics and Genomic Sciences. 1-3 Hour.
Covers different topics in the fields of genetics and genomics.

GGSC 665. Research Techniques for Aquatic Animals of Human Diseases. 4 Hours.
This course will focus on the techniques and procedures used for research with aquatic animal models of human disease. Lecture and lab approaches are used.

GGSC 670. Principles of Pharmacogenetics. 3 Hours.
Most of the drugs that we use today were developed with the assumption that the same drug will work equally well in all the patients that have the same disease. However, there is considerable variability between individual patients - both in the therapeutic response and the adverse effects of the same drug - that is largely determined by the differences in their genotypes. Pharmacogenetics and pharmacogenomics study the genetic determinants of drug response, with the goal to identify genetic variants that can be used to predict the efficacy of a particular drug in a particular patient and to avoid adverse drug reactions. This will ultimately enable implementation of personalized treatment options, by selecting the drugs that will have the best efficacy and the least toxicity for each individual patient. This course will introduce students to the basic principles of pharmacogenetics, demonstrate examples of drug/genotype interactions, highlight the available pharmacogenetic resources, and discuss the potential benefits, as well as limitations and challenges of pharmacogenetics and personalized medicine.

GGSC 690. Model Systems for Genetic Disorders. 3 Hours.
Invertebrate and non-human vertebrate species are commonly used in scientific research work to provide significant insights into human genetic processes and disease. This course focuses on the different methods and strategies by which researchers use these systems for genetic and genomic analyses of human biology and relevant disorders. Model organisms covered include, but are not limited to nematodes (C. elegans), fruit flies (Drosophila sp.), zebrafish (Danio rerio), and mice (Mus musculus).

GGSC 691. Personalized Genomic Medicine. 3 Hours.
Significant developments in the fields of genetics and genomics are making it possible to tailor medical care to the specific needs of patients. New diagnostic tests, up to and including whole genome sequencing, provide increasingly powerful tools for the identification of the genetic basis of both rare and common disorders. Better understanding of the causes of disease are permitting drugs to be developed that precisely target disease mechanisms, increasing the efficacy and avoiding side effects. These and other new advanced are leading to major changes in healthcare delivery and provide the consumer with new opportunities and complex choices. This course will focus on exploring state-of-the-art genetic, genomic, and informatic tools now available to enable personalization of healthcare.

INFO - Informatics Courses

INFO 601. Introduction to Bioinformatics. 3 Hours.
Introduction to bioinformatics and computational biology, with emphasis on concepts and application of informatics tools to molecular biology. It covers biological sequence analysis, gene prediction, genome annotation, gene expression analysis, protein structure prediction, evolutionary biology and comparative genomics, bioinformatics databases, cloud computing, basic R-based data analysis, simple programming skills using Perl, Linux/Unix environment and command lines, visual analytics, and social/legal aspects of open science. It will have a class research project component.
Prerequisites: INFO 510 [Min Grade: C]

INFO 602. Algorithms in Bioinformatics. 3 Hours.
This course introduces various fundamental algorithms and computational concepts for solving questions in bioinformatics and functional genomics. These include graph algorithms, dynamic programming, combinatorial algorithms, randomized algorithms, pattern matching, classification and clustering algorithms, hidden Markov models and more. Each concept will be introduced in the context of a concrete biological or genomic application. A broad range of topics will be covered, ranging from genome annotation, genome reconstruction, microarray data analysis, phylogeny reconstruction, sequence alignments, to variant detection.
Prerequisites: INFO 601 [Min Grade: C]

INFO 603. Biological Data Management. 3 Hours.
The introduction of biological data management concepts, theories, and applications. Basic concepts such as relational data representation, relational database modeling, and relational database queries will be introduced in the context of SQL and relational algebra. Advanced concepts including ontology representation and database development workflow will be introduced. Emerging big data concepts and tools, including Hadoop and NoSQL, will be introduced in the context of managing semi-structured and unstructured data. Application of biological data management in biology will be covered using case studies of high-impact widely used biological databases. A class project will be required of all participants.
Prerequisites: INFO 601 [Min Grade: C]

INFO 604. Next-generation Sequencing Data Analysis. 3 Hours.
This course is aimed to equip participants with the essential knowledge and skills required to begin analyzing next-generation sequencing data and carry out some of the most common types of analysis. The topics covered in-depth during this course are the analysis of RNA-Seq, ChIP-Seq data, ATACseq data, and Single-cell data, with an optional Variant Calling session. The sessions will also include Introduction to next-generation sequencing (NGS) technologies, common NGS data analysis issues, applications of sequencing technologies, introduction to bioinformatics file formats (e.g. FASTQ, bam, bed) and bioinformatics toolkits. At the end of this course, participants will have the expertise to perform these data analysis independently.
Prerequisites: INFO 601 [Min Grade: C]

INFO 610. Programming with Biological Data. 3 Hours.
Course is a 4-week session, class meets 4 days a week from 9:00am-11:30am (in person). This course provides students necessary bioinformatics data and programming skills using Linux, high-performance computing, data-wrangling, MySQL (weeks 1 and 2) and R or Python programming (week 3 and 4). Emphasis will be placed on best practices for conduct of reproducible research. The focus will be on practical computing, programming and data management concepts that can be applied to bioinformatics and data analysis problems.

INFO 611. Intermediate Statistical Analysis I. 3 Hours.
Students will gain a thorough understanding of basic analysis methods, elementary concepts, statistical models and applications of probability, commonly used sampling distributions, parametric and non-parametric one and two sample tests, confidence intervals, applications of analysis of two-way contingency table data, simple linear regression, and simple analysis of variance. Students are taught to conduct the relevant analysis using current software such as the Statistical Analysis System (SAS).

INFO 612. Visual Analytics for Bioinformatics. 3 Hours.
In this course, we will explore the use of visualization techniques as a concise and effective way to help analyze, understand, interpret and communicate complex biological data. Principles of design, visual rhetoric/communication, and appropriate usage will be introduced. We will cover representation of different data types, concentrating on those generated by data-rich platforms such as next-generation sequencing applications, flow/mass cytometry, and proteomics, and will discuss the use of visualization techniques applied to assessing data quality and troubleshooting. Various topics including dimension reduction, hierarchical visualizations, unsupervised learning, graph theory, networks/layouts and interactivity will be discussed. We will review the algorithmic underpinnings of various methods that lead to their appropriate and effective use. Finally, we will review a variety of genomics/bioinformatics-related visualization tools that are available. We will use Matlab throughout the course to create beautiful and effective visualizations.
Prerequisites: INFO 603 [Min Grade: C]

INFO 651. Systems Biomedicine of Human Microbiota. 3 Hours.
The human microbiota is the collection of microorganisms (bacteria, archaea, fungi and viruses) that reside within human tissues and biofluids. Such resident microorganisms compose the majority of cells in human bodies and are key contributors to human development, health, and disease. However, most studies focus on genomics and microbiome statistical representations alone, while spatial-temporal analysis, multi-source data integration and modeling are necessary to predict and understand interactions between microorganisms, human hosts, and the environment. This course will highlight state-of-the-art microbiome/microbiota research and provide essential training in mathematical, computational and systems biology to derive integrative and predictive models of microbiota-host interactions in the context of human health and disease.
Prerequisites: INFO 601 [Min Grade: C] and (MA 560 [Min Grade: C] or BME 670 [Min Grade: C])

INFO 662. Biomedical Applications of Natural Language Processing. 3 Hours.
Students will be introduced to Natural Language Processing (NLP) including core linguistic tasks such as tokenization, lemmatization/stemming, POS tagging, parsing and chunking. Applications will focus on Deep Learning methods using pytorch with a focus in information extraction including Named Entity Recognition, semantic role labeling, word sense disambiguation, normalization, summarization, question answering and text classification. Applications and data will have a biomedical focus, but no biology or medical background is required.

INFO 671. Clinical Informatics Seminar I. 1 Hour.
For master's student only. Students will learn how to prepare, present, and critique research presentations in clinical informatics by attending seminar presentations made by presenters. Seminars are presented by graduate students, faculty, visitors, or online speakers. Students must show evidence of prior preparation, active participation, and documented comprehension of the topics.
Prerequisites: INFO 501 [Min Grade: C]

INFO 672. Clinical Informatics Seminar II. 1 Hour.
For master's student only. Students will learn how to prepare, present, and critique research presentations in clinical informatics by attending seminar presentations made by presenters. Seminars are presented by graduate students, faculty, visitors, or online speakers. Students must show evidence of prior preparation, active participation, and documented comprehension of the topics.
Prerequisites: INFO 671 [Min Grade: C]

INFO 673. Clinical Informatics Journal Club. 0-1 Hours.
Students will learn how to read, present, and critique primary research publications in clinical informatics. Journal club participants will present high-impact recent journal publications selected by course instructors and learn how to read the paper, write critiques, and organize analysis insights into review papers. Students must show evidence of prior preparation prior to journal clubs and write critiques to show comprehension of the topics throughout the semester.

INFO 680. Implementation and Evaluation of Clinical Systems. 3 Hours.
Health information technology (HIT) tools such as Electronic Health Records (EHRs) are used to facilitate management of patient care data, to computerize clinical workflows, and to support health professionals in their medical decision making process. As a result of the U.S. Federal Government incentive program known as Meaningful Use, EHRs have been adopted on a national scale and are now used in almost every health care organization across the country. Although the literature exploring the impact of HIT adoption and use has also increased, previous studies have produced mixed results, leaving unanswered questions as to the impact of HIT on quality of care, patient safety, and health care providers' productivity. In this course, students will be introduced to project management tools and techniques commonly used for managing implementation of HIT systems as well as research approaches to conduct systematic evaluations of the impact of these systems on health care outcomes and organizations. This foundational course is intended for informatics majors and students in allied fields (e.g., health, biological, or computer sciences) who are interested in exploring implementation methods applicable to HIT systems such as EHRs and their components, as well as quantitative, qualitative, and mixed-methods approaches to conduct evaluations of HIT adoption and use. It is primarily intended for students who will pursue research careers in biomedical informatics and is the third course in a three-part series.
Prerequisites: INFO 697 [Min Grade: C]

INFO 690. Data Mining & Statistical Learning. 3 Hours.
Students will learn to discover and implement meaningful insights and knowledge from data. This course covers major concepts and algorithms of data mining. The course will be taught using the SAS Enterprise Miner program. The final project will demonstrate all the data mining techniques covered in the course and furthermore expose students working with real data. At the end of the course students will be proficient in utilizing data mining techniques to exploit data patterns and behavior, gain insider understanding of the data, and produce new knowledge that healthcare decision-makers can act upon. Furthermore, SAS Certified Predictive Modeler certification exam will be offered at the end of the course. Instructor permission is required.

INFO 691. Bioinformatics Seminar I. 1 Hour.
For master's student only. Students will learn how to prepare, present, and critique research presentations in bioinformatics by attending seminar presentations made by presenters. Seminars are presented by graduate students, faculty, visitors, or online speakers. Students must show evidence of prior preparation, active participation, and documented comprehension of the topics.
Prerequisites: INFO 601 [Min Grade: C]

INFO 692. Bioinformatics Seminar II. 1 Hour.
For master's student only. Students will learn how to prepare, present, and critique research presentations in bioinformatics by attending seminar presentations made by presenters. Seminars are presented by graduate students, faculty, visitors, or online speakers. Students must show evidence of prior preparation, active participation, and documented comprehension of the topics.
Prerequisites: INFO 691 [Min Grade: C]

INFO 693. Bioinformatics Journal Club. 2 Hours.
Students will learn how to read, present, and critique primary research publications in bioinformatics. Journal club participants will present high-impact recent journal publications selected by course instructors and learn how to read the paper, write critiques, and organize analysis insights into review papers. Students must show evidence of prior preparation prior to journal clubs and write critiques to show comprehension of the topics throughout the semester.

INFO 695. Special Topics in Bioinformatics. 3 Hours.
Topics of current research interest, such as metagenomics, microbiome, computational medicine, complex systems, deep learning in biology, artificial intelligence in biomedical, and translational bioinformatics applications. May be repeated as different sections taught by different instructors for credit. Permission of instructor is required.

INFO 696. Introduction to Biomedical Informatics Research. 3 Hours.
Biomedical informatics is the art and science of collecting, representing and analyzing patient and biomedical information and translating insights from the information into better health and new medical discoveries. The spectrum of informatics applications ranges from molecules (bioinformatics) to individuals and populations (clinical and public health informatics). We will examine the scientific field and research methods that form the foundation for biomedical informatics research. The course will include didactics, readings, hands-on tool explorations, and a summative work product. This foundational course is intended for informatics majors and students in allied fields (e.g., health, biological, or computer sciences) who are interested in exploring the field of informatics.

INFO 697. Biomedical Informatics Methods. 3 Hours.
Biomedical informatics is the art and science of collecting, representing and analyzing patient and biomedical information and translating insights from the information into better health and new medical discoveries. The spectrum of informatics applications ranges from molecules (bioinformatics) to individuals and populations (clinical and public health informatics). We will examine the scientific field and research methods that form the foundation for biomedical informatics research. The course will include didactics, readings, and applications in applying research methods, culminating in a research plan in grant proposal format and review by a mock panel. This foundational course is intended for informatics majors and students in allied fields (e.g., health, biological, or computer sciences) who are interested in exploring the field of informatics. It is primarily intended for students who will pursue research careers in biomedical informatics and is the second course in a two-part series.
Prerequisites: INFO 696 [Min Grade: C]

INFO 698. Bioinformatics Master's Projects. 1-6 Hour.
Admission to bioinformatics master's program (Plan B: "Project Option") is required. Independent study to conduct bioinformatics research projects, guided by the instructor as the mentor. Permission of instructor and graduate program director is required.

INFO 699. Bioinformatics Master's Thesis Research. 1-6 Hour.
Admission to bioinformatics master's program (Plan A: "Thesis Option") is required.

INFO 701. Introduction to Bioinformatics. 3 Hours.
Introduction to bioinformatics and computational biology, with emphasis on concepts and application of informatics tools to molecular biology. It covers biological sequence analysis, gene prediction, genome annotation, gene expression analysis, protein structure prediction, evolutionary biology and comparative genomics, bioinformatics databases, cloud computing, basic R-based data analysis, simple programming skills using Perl, Linux/Unix environment and command lines, visual analytics, and social/legal aspects of open science. It will have a class research project component.

INFO 702. Algorithms in Bioinformatics. 3 Hours.
This course introduces various fundamental algorithms and computational concepts for solving questions in bioinformatics and functional genomics. These include graph algorithms, dynamic programming, combinatorial algorithms, randomized algorithms, pattern matching, classification and clustering algorithms, hidden Markov models and more. Each concept will be introduced in the context of a concrete biological or genomic application. A broad range of topics will be covered, ranging from genome annotation, genome reconstruction, microarray data analysis, phylogeny reconstruction, sequence alignments, to variant detection.
Prerequisites: INFO 701 [Min Grade: C]

INFO 703. Biological Data Management. 3 Hours.
The introduction of biological data management concepts, theories, and applications. Basic concepts such as relational data representation, relational database modeling, and relational database queries will be introduced in the context of SQL and relational algebra. Advanced concepts including ontology representation and database development workflow will be introduced. Emerging big data concepts and tools, including Hadoop and NoSQL, will be introduced in the context of managing semi-structured and unstructured data. Application of biological data management in biology will be covered using case studies of high-impact widely used biological databases. A class project will be required of all participants.
Prerequisites: INFO 701 [Min Grade: C]

INFO 704. Next-generation Sequencing Data Analysis. 3 Hours.
This course is aimed to equip participants with the essential knowledge and skills required to begin analyzing next-generation sequencing data and carry out some of the most common types of analysis. The topics covered in-depth during this course are the analysis of RNA-Seq, ChIP-Seq data, ATACseq data, and Single-cell data, with an optional Variant Calling session. The sessions will also include Introduction to next-generation sequencing (NGS) technologies, common NGS data analysis issues, applications of sequencing technologies, introduction to bioinformatics file formats (e.g. FASTQ, bam, bed) and bioinformatics toolkits. At the end of this course, participants will have the expertise to perform these data analysis independently.
Prerequisites: INFO 701 [Min Grade: C]

INFO 710. Programming with Biological Data. 3 Hours.
Course is a 4-week session, class meets 4 days a week from 9:00am-11:30am (in person). This course provides students necessary bioinformatics data and programming skills using Linux, high-performance computing, data-wrangling, MySQL (weeks 1 and 2) and R or Python programming (week 3 and 4). Emphasis will be placed on best practices for conduct of reproducible research. The focus will be on practical computing, programming and data management concepts that can be applied to bioinformatics and data analysis problems.

INFO 711. Intermediate Statistical Analysis I. 3 Hours.
Students will gain a thorough understanding of basic analysis methods, elementary concepts, statistical models and applications of probability, commonly used sampling distributions, parametric and non-parametric one and two sample tests, confidence intervals, applications of analysis of two-way contingency table data, simple linear regression, and simple analysis of variance. Students are taught to conduct the relevant analysis using current software such as the Statistical Analysis System (SAS).

INFO 712. Visual Analytics for Bioinformatics. 3 Hours.
In this course, we will explore the use of visualization techniques as a concise and effective way to help analyze, understand, interpret and communicate complex biological data. Principles of design, visual rhetoric/communication, and appropriate usage will be introduced. We will cover representation of different data types, concentrating on those generated by data-rich platforms such as next-generation sequencing applications, flow/mass cytometry, and proteomics, and will discuss the use of visualization techniques applied to assessing data quality and troubleshooting. Various topics including dimension reduction, hierarchical visualizations, unsupervised learning, graph theory, networks/layouts and interactivity will be discussed. We will review the algorithmic underpinnings of various methods that lead to their appropriate and effective use. Finally, we will review a variety of genomics/bioinformatics-related visualization tools that are available. We will use Matlab throughout the course to create beautiful and effective visualizations.

INFO 751. Systems Biomedicine of Human Microbiota. 3 Hours.
The human microbiota is the collection of microorganisms (bacteria, archaea, fungi and viruses) that reside within human tissues and biofluids. Such resident microorganisms compose the majority of cells in human bodies and are key contributors to human development, health, and disease. However, most studies focus on genomics and microbiome statistical representations alone, while spatial-temporal analysis, multi-source data integration and modeling are necessary to predict and understand interactions between microorganisms, human hosts, and the environment. This course will highlight state-of-the-art microbiome/microbiota research and provide essential training in mathematical, computational and systems biology to derive integrative and predictive models of microbiota-host interactions in the context of human health and disease.
Prerequisites: INFO 701 [Min Grade: C] and (MA 560 [Min Grade: C] or BME 670 [Min Grade: C])

INFO 762. Biomedical Applications of Natural Language Processing. 3 Hours.
Students will be introduced to Natural Language Processing (NLP) including core linguistic tasks such as tokenization, lemmatization/stemming, POS tagging, parsing and chunking. Applications will focus on Deep Learning methods using pytorch with a focus in information extraction including Named Entity Recognition, semantic role labeling, word sense disambiguation, normalization, summarization, question answering and text classification. Applications and data will have a biomedical focus, but no biology or medical background is required.

INFO 773. Clinical Informatics Journal Club. 1 Hour.
Students will learn how to read, present, and critique research publications in clinical informatics. Journal Club participants will present high-impact recent journal publications selected by course instructors and learn how to read the paper, write critiques, and organize analysis insights into review papers. Students must show evidence of prior preparation prior to journal clubs and write critiques to show comprehension of the topics throughout the semester.

INFO 780. Implementation and Evaluation of Clinical Systems. 3 Hours.
Health information technology (HIT) tools such as Electronic Health Records (EHRs) are used to facilitate management of patient care data, to computerize clinical workflows, and to support health professionals in their medical decision making process. As a result of the U.S. Federal Government incentive program known as Meaningful Use, EHRs have been adopted on a national scale and are now used in almost every health care organization across the country. Although the literature exploring the impact of HIT adoption and use has also increased, previous studies have produced mixed results, leaving unanswered questions as to the impact of HIT on quality of care, patient safety, and health care providers' productivity. In this course, students will be introduced to project management tools and techniques commonly used for managing implementation of HIT systems as well as research approaches to conduct systematic evaluations of the impact of these systems on health care outcomes and organizations. This foundational course is intended for informatics majors and students in allied fields (e.g., health, biological, or computer sciences) who are interested in exploring implementation methods applicable to HIT systems such as EHRs and their components, as well as quantitative, qualitative, and mixed-methods approaches to conduct evaluations of HIT adoption and use. It is primarily intended for students who will pursue research careers in biomedical informatics and is the third course in a three-part series.
Prerequisites: INFO 797 [Min Grade: C]

INFO 790. Data Mining & Statistical Learning. 3 Hours.
Students will learn to discover and implement meaningful insights and knowledge from data. This course covers major concepts and algorithms of data mining. The course will be taught using the SAS Enterprise Miner program. The final project will demonstrate all the data mining techniques covered in the course and furthermore expose students working with real data. At the end of the course students will be proficient in utilizing data mining techniques to exploit data patterns and behavior, gain insider understanding of the data, and produce new knowledge that healthcare decision-makers can act upon. Furthermore, SAS Certified Predictive Modeler certification exam will be offered at the end of the course. Instructor permission is required.

INFO 791. Bioinformatics Seminar I. 1 Hour.
For doctoral student only. Students will learn how to prepare, present, and critique research presentations in bioinformatics by attending seminar presentations made by presenters. Seminars are presented by graduate students, faculty, visitors, or online speakers. Students must show evidence of prior preparation, active participation, and documented comprehension of the topics.
Prerequisites: INFO 701 [Min Grade: C]

INFO 792. Bioinformatics Seminar II. 1 Hour.
For doctoral student only. Students will learn how to prepare, present, and critique research presentations in bioinformatics by attending seminar presentations made by presenters. Seminars are presented by graduate students, faculty, visitors, or online speakers. Students must show evidence of prior preparation, active participation, and documented comprehension of the topics.
Prerequisites: INFO 791 [Min Grade: P]

INFO 793. Bioinformatics Journal Club. 2 Hours.
Students will learn how to read, present, and critique primary research publications in bioinformatics. Journal club participants will present high-impact recent journal publications selected by course instructors and learn how to read the paper, write critiques, and organize analysis insights into review papers. Students must show evidence of prior preparation prior to journal clubs and write critiques to show comprehension of the topics throughout the semester.

INFO 794. Advanced Bioinformatics Journal Club. 2 Hours.
Students will learn how to read, present, and critique primary research publications in bioinformatics. Journal club participants will present high-impact recent journal publications selected by course instructors and learn how to read the paper, write critiques, and organize analysis insights into review papers. Students must show evidence of prior preparation prior to journal clubs and write critiques to show comprehension of the topics throughout the semester.
Prerequisites: INFO 793 [Min Grade: P]

INFO 795. Special Topics in Bioinformatics. 3 Hours.
Topics of current research interest, such as metagenomics, microbiome, computational medicine, complex systems, deep learning in biology, artificial intelligence in biomedical, and translational bioinformatics applications. May be repeated as different sections taught by different instructors for credit. Permission of instructor is required.

INFO 796. Introduction to Biomedical Informatics Research. 3 Hours.
Biomedical informatics is the art and science of collecting, representing and analyzing patient and biomedical information and translating insights from the information into better health and new medical discoveries. The spectrum of informatics applications ranges from molecules (bioinformatics) to individuals and populations (clinical and public health informatics). We will examine the scientific field and research methods that form the foundation for biomedical informatics research. The course will include didactics, readings, hands-on tool explorations, and a summative work product. This foundational course is intended for informatics majors and students in allied fields (e.g., health, biological, or computer sciences) who are interested in exploring the field of informatics.

INFO 797. Biomedical Informatics Methods. 3 Hours.
Biomedical informatics is the art and science of collecting, representing and analyzing patient and biomedical information and translating insights from the information into better health and new medical discoveries. The spectrum of informatics applications ranges from molecules (bioinformatics) to individuals and populations (clinical and public health informatics). We will examine the scientific field and research methods that form the foundation for biomedical informatics research. The course will include didactics, readings, and applications in applying research methods, culminating in a research plan in grant proposal format and review by a mock panel. This foundational course is intended for informatics majors and students in allied fields (e.g., health, biological, or computer sciences) who are interested in exploring the field of informatics. It is primarily intended for students who will pursue research careers in biomedical informatics and is the second course in a two-part series.
Prerequisites: INFO 796 [Min Grade: C]

INFO 799. Bioinformatics Research for Dissertation. 1-12 Hour.
Admission to candidacy is required.

MIC-Microbiology Courses

MIC 600. The Microbiome in Health and Immunity. 3 Hours.
This course will review the functions of the immune system and discuss the role of the microbiome in health and disease. This course will use a personal microbiome analysis project to develop information literacy, critical thinking, and communication skills while investigating the interplay between the microbiota and immune system components. Additional topics including the role of the microbiome in maintaining gut health, influencing the gut-brain axis, and nutrient synthesis will also be discussed.
Prerequisites: MIC 275 [Min Grade: C]

MIC 601. Foundations in Immunology: The Innate Immune System. 3 Hours.
This course will introduce the cells, receptors, signaling pathways and soluble mediators associated with the innate immune response. The basic components of the innate immune system will then be discussed in the context of their role in the physical, physiological, phagocytic and inflammatory barriers that comprise the innate immune system. Importantly, emphasis will be placed on the molecular and cellular mechanisms that are used by the innate immune system to detect and respond to microbial pathogens to provide the first line of defense.
Prerequisites: MIC 275 [Min Grade: C]

MIC 602. Foundations in Immunology: The Adaptive Immune System. 3 Hours.
This course will provide an in-depth analysis of the cells (T, B and antigen presenting cells), tissues (primary and secondary) and soluble factors (cytokines and chemokines) that comprise the adaptive humoral immune response. The course will examine how cells of the adaptive immune system discriminate self from non-self, including the nature of antigen receptors, the types of antigens recognized and the signals involved in the generation of effector cells that mediate the response.
Prerequisites: MIC 275 [Min Grade: C]

MIC 603. Foundations in Immunology: Microbial Pathogen-Immune System Interaction. 3 Hours.
This course will provide an overview of major concepts related to virulence mechanisms utilized by microbial pathogens and their effect on the host immune response. Emphasis will be placed on important virulence factors/mechanisms associated with bacterial, viral and fungal pathogens and how these alter various components of the innate and adaptive immune responses to allow escape of the pathogen and its survival. This course will introduce the concept of emerging infectious diseases and how their spread is related to their ability to escape detection by the immune system.
Prerequisites: MIC 401 [Min Grade: C] and MIC 402 [Min Grade: C]

MIC 604. Foundations in Immunology: Immunologically-Mediated Diseases. 3 Hours.
This course will focus on the role of the immune system, including the molecular and cellular processes, that contribute to morbidity and mortality associated with immunodeficiency (congenital and acquired), asthma/allergy, autoimmunity (systemic and organ-specific), transplantation and inflammatory syndromes associated with heart disease, cancer, chronic neurological disease and diabetes.
Prerequisites: MIC 401 [Min Grade: C] and MIC 402 [Min Grade: C] or MIC 601 [Min Grade: C] and MIC 602 [Min Grade: C]

MIC 660. Introduction to the Immune System. 3 Hours.
The objective of this Course is to provide a concise overview of the immune system, its cellular and molecular components, and their function in relation to host protection against pathogens. Students will follow clear principles by which these different components of the immune system interact with each other to ensure an effective immune response. Students will learn how the immune system is capable of such enormous diversity in terms of the foreign antigens that it can specifically recognize and react against, while at the same time avoiding similar responses against our own cells, tissues and organs. By describing paradigmatic examples of these immune response mechanisms in the context of exposure to typical bacteria and viruses, a solid basic foundation for subsequent immunology courses will be provided, including those courses that are focused on immune-mediated diseases, immune protection against cancer and its evolution during tumor progression, vaccines, and immune-based therapeutics in immune-mediated and other diseases. Throughout the course, Students will be encouraged to consider the concept of immune balance in in terms of how over-reactivity of the immune mechanisms they will be learning about can lead to excessive (or chronic) inflammation or autoimmunity, and why certain key physiological and life-style factors can adversely affect this balance and are therefore recognized as urgent topics in biomedical research and medicine. Undergraduate-level Biochemistry or Cell Biology must be taken before registering for this course.

MIC 661. Immune-mediated Diseases. 3 Hours.
The objective of this Course is to condense knowledge of the cellular and molecular components of the immune system and their function in relation to host protection against pathogens (covered in the previous Masters Immunology Program course MBS 696 ST: Introduction to the Immune system) into clear paradigmatic principles by which these different branches of the immune system interact with each other and other biological systems such as the microbiome to maintain normal immune balance. Students will learn how modifications of immune cell development or function associated with genetic, pathogenic and environmental factors affect this balance, promoting immune hypersensitivities, causing immune deficiency, or predisposing to the development of autoimmune diseases. Systemic Lupus Erythematosus and Multiple Sclerosis will be used as prototypical examples of systemic and organ-specific autoimmunity respectively to exemplify key aspects related to the pathogenic mechanisms, clinical features, therapeutics, and potential future curative approaches built from basic immunological research utilizing animal models.
Prerequisites: MIC 660 [Min Grade: C]

MIC 665. Current Topics in Immunology. 3 Hours.
The current topics courses will in general cover current topics related to immunology, host defense, and immune-based therapeutics. This specific course will examine the factors influencing the disease course of COVID-19 and current treatment and prevention options with an emphasis on discussing the appropriate immune response that leads to mild symptoms and clearance of SARS-CoV-2 and the immune dysregulation that contributes to severe COVID-19. Topics in viral infection with an emphasis on coronaviruses and the concept of spillover will be discussed. Additionally, anti-viral responses of the innate and adaptive immune responses, concepts in immune regulation, and their application in developing vaccines and therapeutics to prevent and treat COVID-19 will be covered.
Prerequisites: MIC 660 [Min Grade: C]

MSTP-Med Science Training Prog Courses

MSTP 793. Basic Research Forum. 1 Hour.
This course is for entering MD-PHD students to meet the GBS Core-Course requirements. The following list consists of desirable competencies for enrolled MD-PHD students to achieve while in this course: (a) Learn fundamental topics in biomedical research that will not be covered in SOM courses; (b) Fill gaps in curriculum between GBS707/709; and (c) Introduce topics that may be of interest for future lab rotations.

MSTP 794. Translational Research Seminar. 1 Hour.
The CAMS Translational Research Seminar series, required fall, spring and summer semesters, invites UAB faculty (PhD, MD, MD-PhD or MPH) who are conducting translational research to present their work to students in the MSTP. The goal of the presentation is three fold: (a) to inform students about the career path of the investigator, (b) to provide them with information regarding the initiation and conduct of translational research, and (c) to expose students to current developments in basic and clinical research. There are two to three sessions each year in which panels or round tables discuss topics, including mentor selection, preparation for residency, residency selection, and the overall UAB MSTP experience. Lecturers give a 45-minute presentation followed by a 15-minute question and answer session. This course is open only to MD-PhD students.

MSTP 795. Continuing Clinical Education. 1 Hour.
This course is designed to maintain clinical skills and knowledge during students' dissertation research years. MSTP students will take the course every fall semester and spring semester during their PhD dissertation phase. Each semester, students will be required to complete seven course components. Some components serve to maintain clinical skills and includes students conducting a resident-supervised clinical encounter as well as completing one half day of shadowing. Other components serve to maintain or bolster clinical knowledge and include students attending case conferences and/or participating in simulation sessions. This course is open only to MD-PhD students.

MSTP 796. Anatomy Lab TA Opportunity. 1 Hour.
From 23 TOTAL dissections between the MS1 and MS2 years, students choose any 6 dissections to teach depending on their availability. Overview: MS4 students will serve as Anatomy Teaching Associates for MS1 and MS2 students during scheduled lab times to make preclinical training more robust and clinically relevant. Course benefits for MS4 students: - Small-group anatomy training aimed to improve knowledge of anatomy & dissection skills. - Teaching & mentoring experience of students with less clinical experience. - Flexible schedule: Preferred dissections may be changed up to 1 week before the preclinical scheduled lab time. Format: - Students will attend a 1-hour orientation session addressing effective teaching techniques in August of the entering year (accommodation for absence can be made on a case-by-case basis). - The week prior to their chosen dissections, students will receive 2 hours of small group training in SOM lab under the directions of trained UAB Anatomist and Course Director Dr. Resuehr. During this training, students will perform the relevant cadaveric dissection which will be saved for demonstration during the preclinical lab. -TAs will be assigned to a group of preclinical students during their scheduled lab time to help answer questions. Particular emphasis will be placed on providing preclinical students with clinical correlates. Learning Objectives: - Dissect and identify all associated structures of their chosen dissections emphasizing the relation of structures to each other and common pathologies. - Understand common anatomical variations (if applicable). - Understand anatomically relevant information pertaining to clinical procedures. - Understand geriatric changes. - Mentor and teach students with less experience.

MSTP 798. MSTP Non-Dissertation Hours. 1-8 Hour.
Laboratory research pre-qualification. Only open to MSTP students.

MSTP 799. MSTP Dissertation Hours. 1-8 Hour.
Dissertation research. Only open to MSTP students.
Prerequisites: GAC Z

NBL-Neurobiology Courses

NBL 600. Special Topics in Neurobiology 1. 3 Hours.
This course covers different topics that have to do with Neurobiology.

NBL 601. College of Basic Cognition & Clinical Neuroscience. 3 Hours.
The Colloquium in Basic, Cognitive and Clinical Neuroscience is a faculty seminar. The Colloquium will expose students to cutting edge research programs and technologies from approximately 25 faculty each year who serve as mentors for the Undergraduate Neuroscience Major and Graduate Neuroscience Program. Faculty will also discuss strategies for development of careers in medicine and research. Students will prepare by reading an assigned research article authored by the speaker and be prepared for a group discussion. Class meets for one and a half hours a week.

NBL 610. Synapses, Neurons and Brains. 3 Hours.
Molecular Neuroscience will provide students an advanced understanding of how the brain works with a focus on protein function. Everything the brain does is built upon the actions of proteins, many of which are completely unique to the brain. Together we will work to thoroughly understand the exact molecular mechanisms utilized by the brain to support the complex function of our most fascinating organ. Topics covered will include brain morphogenesis, axonal outgrowth, synapse formation, neurotransmitter biosynthesis, intracellular signaling, and the blood brain barrier. This lecture course is designed to fulfill a neuroscience major's requirement for an advanced course. Non-neuroscience majors should seek course master approval before enrolling and must have a significant background in biology and/or chemistry. Students will be required to purchase a text. Grades will be assigned based on points accumulated through weekly quizzes, cumulative exams, and written reports. It is strongly recommended that students have undergraduate coursework in biology and chemistry prior to taking this class.

NBL 620. No Self Control. 3 Hours.
Survival of self and species has been evolutionarily wired into the brain. Largely, involving sub-cortical networks, animals are strongly rewarded through beneficial outcomes and driven away from aversive situations. Overseeing these opposing subconscious determinants of motivated behavior is a pre-frontal cortical command center, which along with additional systems that provide for experiential memory and emotional significance, guide the choices we make. This course will provide the participant with an introduction to the neuronal pathways that underlie normal decision making, with a major focus on how this circuitry becomes compromised during addiction. These topics should be relevant to students interested in biomedicine, health professions or counseling. NBL 355 or NBL 610 recommended but not required.

NBL 624. This is your brain on drugs: Neuropsychopharmacology. 3 Hours.
People have long exploited the brain's responses to a wide variety of chemicals to alter their experiences in the world. These drugs have had profound effects on individuals and societies, both positive and negative. This course will cover the neurological basis of the response to these drugs, their psychological effects, mechanisms of action that underly them, and the pharmacology of drugs in the brain and body. Students should also be able to identify different drug classes, the relationships between drugs and society, and the history of how we have understood different drugs. NBL 230 is recommended.
Prerequisites: NBL 230 [Min Grade: C]

NBL 625. Methods in Human Neuroimaging. 3 Hours.
The ability to perform neuroimaging studies on awake human individuals has produced a conceptual revolution in the study of human cognition. This course will examine the methods and techniques in human neuroimaging with the primary goal of building basic understanding of how these tools work. The course will explore techniques, such as single cell recordings, deep brain stimulation, electroencephalography, magnetoencephalography, and diffusion weighted imaging, and focuses on functional magnetic resonance imaging. By the end of the course, students will have gained basic knowledge in the field and will be able to read and critically assess scientific journal articles that make use of a variety of neuroimaging methods. The secondary and implicit goal of this course is to create and nurture, in students, a genuine interest in neuroscience and neuroimaging.
Prerequisites: NBL 356 [Min Grade: C] or NBL 655 [Min Grade: C] or NBL 656 [Min Grade: C]

NBL 632. Diseases of the Nervous System I. 3 Hours.
Major advances have been made in understanding diseases of the nervous system at cellular and molecular levels. This course intends to review some of the most common CNS disorders such as Alzheimer's Disease, Parkinson's Disease, ALS and Huntington's Disease. This course will focus solely on identification of cellular pathways involved in these diseases and how alterations in these pathways result in neurodegeneration. This class will build upon fundamental concepts in cell biology, genetics and neuroscience to gain a better understanding of disease pathogenesis in the nervous system.
Prerequisites: NBL 356 [Min Grade: C] or NBL 655 [Min Grade: C] or NBL 656 [Min Grade: C]

NBL 633. Diseases of the Nervous System. 3 Hours.
Molecular mechanisms and treatments for neurological, psychiatric, and injury based disorders and diseases of the nervous system. Topics include neurodevelopmental disorders (including intellectual disability and autism spectrum disorders), neurological disorders (including neurodegenerative and demyelinating disease), neuropsychiatric disorders (including depression disorders and schizophrenia), and injury to the nervous system (including stroke and traumatic brain and spinal cord injury).
Prerequisites: NBL 356 [Min Grade: C] or NBL 655 [Min Grade: C] or NBL 656 [Min Grade: C]

NBL 634. Mechanisms of Memory. 3 Hours.
Molecular, cellular, systems and medical components of neuroscience, with an emphasis on cognition and cognitive disorders. Covers topics ranging from genes and molecules to human behavior, using cognitive function and clinical cognitive disorders as the unifying theme, with a focus on learning and memory and disorders of these processes.

NBL 644. Memento Mori: neurodegeneration from cradle to coffin and bench to bedside.. 3 Hours.
We all die. We live in a wealthy enough country that many of us will survive long enough to die with a neurodegenerative disease. As the population ages, neurodegenerative diseases are becoming more and more common, so it's important to understand them and figure out how to treat them. This course will cover multiple neurodegenerative diseases, from ones that begin in childhood to slow-progressing diseases that occur late in life. We will discuss approaches to treat the diseases, the basics of the therapeutic pipeline, basic disease mechanisms, and common themes across neurodegeneration.
Prerequisites: NBL 230 [Min Grade: C] and (NBL 433 [Min Grade: C] or NBL 633 [Min Grade: C])

NBL 655. Synapses, Neurons and Brains. 3 Hours.
Introduction to the cellular and molecular biology, biochemistry, biophysics, genetics and function of the mammalian nervous system. This course will emphasize the development, anatomy, cellular and molecular biology and biochemistry of neurons and glial cells, and introduce electrical, biophysical and chemical signaling within and across neurons.

NBL 656. From Systems to Cog Neuro. 3 Hours.
Introduction to the cellular and molecular biology, biochemistry, biophysics, genetics and function of the mammalian nervous system. This course will emphasize mechanisms of synaptic transmission, sensory systems, neuropharmacology, and synaptic plasticity; and introduce the molecular basis of diseases and disorders of the central and peripheral nervous systems.

NBL 657. Neurogenetics. 3 Hours.
This is an upper level interdisciplinary course that links key concepts in genetics to neurological disease. It will provide students with an understanding as to how mutations lead to disease and what kinds of research is involved in studying genetic disorders. This course will also include a research and service learning component to incorporate experience-based learning into the classroom.
Prerequisites: BY 123 [Min Grade: C]

NBL 684. Don't Sleep on this class: biological rhythms and sleep. 3 Hours.
Earthly creatures have adapted to light-dark cycles created by the earth's rotation. Complex biological behaviors and even cellular changes have these twenty-four–hour cycles, called circadian rhythms. This course will dive into the basis of these rhythms: exogenous zeitgebers and molecular clocks; and their consequences. Perhaps the most prominent behavioral rhythm is sleep, so we will distinguish between sleep and circadian rhythms, learn what sleep is, why we sleep, and what the consequences of circadian and sleep disruption are. NBL 230 is recommended.
Prerequisites: NBL 230 [Min Grade: C]

NBL 698. Research Practice in Neurobiology. 1-6 Hour.
Project or research activity supervised by faculty.

NBL 700. Introduction to Cellular and Molecular Neurobiology. 3 Hours.
Topics in Neurobiology.

NBL 703. Nuerobiology Seminar Series. 1 Hour.
Current research topics in neurobiologypresented by visiting scholars and campus faculty.

NBL 707. Cognition & Cognitive Disorder. 1 Hour.

NBL 711. Medical Neuroscience. 5 Hours.

NBL 720. Membrane Excitability Biophysics. 3 Hours.
The course will consist of 7 topics covered over 8 weeks (including course orientation): Properties of lipid bilayers, Ions in solution, Ion channel permeability and selectivity, Ligand-dependent channel gating, G-protein-coupled receptor kinetics, Transporters and Pumps, and Voltage-dependent channel gating. For each topic a faculty member will present an overview lecture and students will present a single mini-lecture on a more focused concept within the topic. The mini-lecture will be based on published literature and should be discussed before presentation with the topic leader. It should be a formal PowerPoint lecture lasting a maximum of 20 min.

NBL 723. Experimental Design. 1 Hour.
In depth and specialized training for our Roadmap Scholars in hypothesis development, experimental design and scientific writing. During this course, Roadmap Scholars will develop an NRSA, or similar, grant proposal.

NBL 725. Seminar Practice in Cellular and Molecular Neuroscience. 1 Hour.
The course will provide guidance and practice in the presentation of research seminars. It will also provide a forum for students to become actively involved in listening to seminar presentations and partcipating in speaker questioning. Once during the course each student will present a 50 minute seminar describing his/her current research, during which the other students and participating faculty will ask questions and provide comments and suggestions. Following the presentation the student will receive a constructive critique from the faculty.

NBL 729. Mechanisms of Signal Transduction. 1-3 Hour.

NBL 730. Neurobiology of Disease. 3 Hours.
Major advances have been made in understanding diseases of the nervous system at a cellular and molecular level. Several new findings have had therapeutic implications and have resulted in the development of novel drugs or new disease management strategies. This course intends to review the most common brain and CNS disorders. It will offer a brief clinical introductionto the disease, but will emphasize reviewing current knowledge of the disease at a cellular and molecular level. The course will be taught by several UAB professors who have active research programs directed at studying nervous sys. diseases. The course is designed for advanced graduate and medical students who have a good neurobiology background with NEUR702/NBL750/NBL7.

NBL 735. Statistics for Biomedical Science. 3 Hours.

NBL 740. Mechanisms of Memory. 4 Hours.
This course integrates the molecular, cellular, systems, and medical components of the core curriculum with an emphasis on cognition and cognitive disorders. Thus, the course covers topics ranging from genes and molecules to human behavior, using cognitive function and clinical cognitive disorders as the unifying theme, with a focus on learning and memory and disorders of these processes.

NBL 741. Writing and Presenting. 1 Hour.
Roadmap Scholars will be expected to attend and present posters or talks describing their research at international meetings, such as the Society for Neuroscience annual meeting. We will develop a course to assist the students in writing their abstracts, as well as designing their presentation for the meeting. This course will assist the Neuroscience Roadmap Scholars in developing their presentation skills as neuroscientists.

NBL 743. Methods in Neuroimaging. 3 Hours.
Cognitive neuroscience research has provided valuable insights into the workings of the human brain. The techniques used in cognitive neuroscience span from postmortem brain studies to neuroimaging studies. The ability to perform neuroimaging studies on awake human individuals engaged in cognitive, social, sensory, and motor tasks has produced a conceptual revolution in the study of human cognition. This course will comprehensively examine the methods and techniques in neuroimaging with the primary goal of building fundamental knowledge in the concepts and techniques of neuroimaging. By the end of the course, students will have gained basic knowledge in the field and will be able to read and critically assess scientific journal articles that make use of a variety of neuroimaging methods. The secondary and implicit goal of this course is to create and nurture, in students, a genuine interest in neuroscience and neuroimaging. The course will explore techniques, such as single and multi cell recordings, deep brain stimulation, electroencephalography, functional magnetic resonance imaging, and diffusion tensor imaging. This course will be an apt venue for graduate students interested in neuroscience research to build a platform for continuing studies.

NBL 745. Professional Development Course. 1 Hour.
Today’s researchers, scientists, and academics face an increasingly competitive world. We will create a professional development course for our UAB Neuroscience Roadmap Scholars to provide support for their aspiration to become independent and successful neuroscientists.

NBL 752. Developmental Neuroscience. 3 Hours.
The course will utilize the scientific literature and faculty lectures to cover a broad range of topics related to the mechanisms of building a brain. The topics covered range from neural induction in early development, to axonal guidance and synapse formation, to neuro-gial interactions in the adult nervous system. Grades will be based on two exams and student participation in class discussions.

NBL 755. Mind/Brain. 3 Hours.

NBL 758. Synaptic Dynamics. 3 Hours.
A student-driven discussion of the molecular and physiological properties of synapses, this course explores the molecular physiology underlying the control of neurotransmitter release and the postsynaptic response. Quantal theories of synaptic transmission will be discussed with respect to anatomical and physiological differences between central synapses and the neuromuscular junction. Synaptic plasticity mechanisms will also be discussed.

NBL 770. Glial Biology in Medicine. 3 Hours.
This course will cover the role of astrocytes, oligo-dentrocytes and microglia in both the normal development and function of the nervous system, and also their role in injury and disease. Presentations will be student led, with the assistance of the faculty.
Prerequisites: NBL 700 [Min Grade: C] or CMB 754 [Min Grade: C] or NBL 712 [Min Grade: C]

NBL 771. Innovative Techniques, Methods and Models in Neuroscience. 1 Hour.
This is a Journal Club style course that will consist of topics related to innovative methods in neuroscience. Students will read and discuss papers on groundbreaking techniques, such as CRISPR/Cas9 systems, optogenetics, CLARITY, flow cytometry and DREADDs. Each week one student will be responsible for presenting the seminal paper discussing the novel technique, providing advantages, disadvantages and limitations of the technique. The class as a whole will then discuss a paper in which the novel technique was applied. The goal of this course is to equip the next generation of neuroscientists to understand the next generation of neuroscience techniques. Class Assignments and Preparation: All students are required to read the assigned manuscript and be prepared to discuss the method and data presented in the manuscript, as well as potential limitations/pitfalls of the approach considered.

NBL 772. Special Topics i n Neurobiology II. 1-3 Hour.
This course will draw on the cutting edge knowledge, expertise and information provided by the spring Neurobiology Seminar program. There will be two one-hour meetings per week. Prior to each seminar, students will discuss a review article pertinent to the seminar topic, and a recent research paper from the speaker's lab. Following the seminar, new findings presented will be discussed. Students will also have the opportunity (optional) of meeting the speaker at lunch prior to the seminar or at a post-presentation reception.

NBL 773. Molecular Brain Aging JC. 1 Hour.
Across the body, age-related protein expression changes underlie the aging process. This journal club focuses on understanding normal brain aging at the cell and molecular level. We will discuss papers that show how both central and peripheral protein expression differences effect cellular function of brain to promote age-related change.

NBL 775. Special Topics in Neurobiology III. 1 Hour.
The aging process is amazing. One person could choose to not exercise, eat fatty foods with abandon, and engage in other risky behaviors but still live to 100 relatively disease free. Meanwhile another develops dementia in their 70s after living a life doing all the “right” things for their body. Often in our desire to prevent and treat disease, we do not spend time studying normal aging process, and thus we don’t understand the system we are working within. To effectively target disease requires a thorough understanding not only of disease mechanism but also of how the brain changes during aging. Even when the cognitive aging process does not directly result in development of disease, the changes that occur effect quality of life and could be targeted for intervention. This journal club will focus on exploring papers investigating how the aging process impacts the brain.

NBL 779. Journal Club Topics. 1 Hour.
Journal Club Topics.

NBL 780. Selected Topics in Neurobiology I. 3 Hours.
This course covers different topics that have to do with Neurobiology.

NBL 781. Selected Topics in Neurobiology II. 1 Hour.
This course covers different topics that have to do with Neurobiology.

NBL 782. Neuroimaging Journal Club. 1-2 Hour.
The Neuroimaging Journal Club was created to encourage the discussion of papers and research related to brain imaging. Modalities discussed including but not limited to magnetic resonance imging (MRI), functional magnetic resonance imaging (fMRI), diffusion tensor imaging (DTI), magnetic resonance spectroscopy (MRS), and electroencephalography (EEG).

NBL 784. Synaptic Transmission and Ion Channel Journal Club. 1 Hour.
The Synaptic Transmission & Ion Channels Journal Club provides a forum for discussion and analysis of papers related to electrophysiology of neurons and astrocytes at the level of synapses and circuits. It is focused primarily on electrophysiological methods.

NBL 785. Neurobiology Journal Club-Synaptic Plasticity. 1 Hour.

NBL 786. Cell Death Mech Journal Club. 1 Hour.
Discussion and critical evaluation of seminal or current papers on a broad topic of cell death methanisms in health and diseases, with special emphasis on autophagic mechanisms impact on cell death.

NBL 788. Biology of Glial Cells Journal Club. 1 Hour.
This journal club covers contemporary primary articles on the biology of glial support cells, their role in normal brain function and Neurological disease.

NBL 789. Neurobiology Journal Club. 1 Hour.

NBL 791. Developing Critical Thinking and Analytical Skills. 1 Hour.
One of the key skills that every graduate student needs is the ability to think critically and to analyze data. Many graduate students have not been instructed in how to read the scientific literature, so NBL791 will include sessions for the Neuroscience Roadmap Scholars on how to read and critique a scientific paper. We will select examples of well-constructed journal articles and help the students to learn how to understand, interpret, and evaluate the findings.

NBL 792. Neuro Lab Bench. 3 Hours.
This course is about preparing students in work pertaining to the preparation of PhD candidates in the neurosciences for collecting data from the nervous system: 3 credits. No prerequisites required. It is expected that the student has access to and familiarity with computers. Books: Lab Math, A handbook of Measurements, Calculations, and other Quantification Skills for Use at the Bench by Dany Spencer Adams.

NBL 798. Non-Dissertation Research in Neurobiology. 1-12 Hour.
Research hours in the lab.

NBL 799. Dissertation Research in Neurobiology. 1-12 Hour.
Research hours in the lab.
Prerequisites: GAC Z

PHR-Pharmacology Courses

PHR 611. Physiological Principles of Pharmacology & Toxicology. 3 Hours.
This course will provide a broad but rigorous overview of physiological principles of pharmacology & toxicology. The course includes five separate “modules”, each taught by faculty of UAB Dept. Pharmacology & Toxicology. Each module has separate review session(s) and exams. In addition, each module will have small group problem-based learning (PBL) sessions (see below). There will be one exam specific for each module. At the end of the course, students will be assigned a drug from a pre-assigned list and discuss its pharmacology and toxicology, in the form of a PPT presentation. Students will be graded for their performance on exams, completing PBL assessments, student presentation, and participation in live PBL sessions.

PHR 612. Systems Physiology and Pharmacology I. 3 Hours.
This course will introduce the student to the use, mechanism of action and physiological properties of major families of drugs that affect the cardiovascular system, autonomic nervous system (ANS) and central nervous system (CNS). Lectures will provide an overview of nervous system / cardiovascular physiology and pathophysiology that results from various diseases, disorders and injuries, the drugs used to treat these conditions and their mechanisms of action. Both classical drugs and newer classes of drugs will be discussed for both their therapeutic value and also their use in different research settings. This course will be taught using a combination of traditional didactic lectures and student participation through discussion of seminal research papers and presentations.

PHR 613. Systems Physiology and Pharmacology II. 3 Hours.
This course will introduce drug use, mechanism of action and physiological properties of major drug families, with a focus on specific organ systems (endocrine, gastrointestinal and renal systems). In addition, this course will also cover specific classes of drugs for cancer treatment specifically related to the organ systems covered in the course. This course is divided into three “modules”. Each module has its own exam. In addition, there are graded student presentations at the end of the semester, topics of discussion to be determined.

PHR 614. Drug Discovery and Development. 3 Hours.
The course will provide an overview of the drug discovery and development process. Topics will include (among others): Target identification and validation, High-Throughput Screening, Hit discovery, Lead optimization, Preclinical testing, Safety requirements, Clinical trials, IND, NDA, Patents, and Federal regulations. The course will highlight multidisciplinary nature of drug discovery and the roles of biologists, medicinal chemists, pharmacologists, regulatory agencies, and investors in the process. Real-life case stories highlighting successful and unsuccessful drug development examples will be introduced for discussions, as well as some current examples of early stage biotech startups.

PHR 615. Pharmacokinetics and Biopharmaceutics. 3 Hours.
Pharmacokinetics is the study of the time-course of drugs in physiological systems. This includes the fate of administered drugs in relation to time starting with absorption, through distribution, and elimination. Pharmacokinetics is fundamental to the understanding of observed drug effects and responses. This course is divided into three sections that are assessed independently. The first section explores the mathematical principles of pharmacokinetics using the compartmental and noncompartmental models of analysis. The second section evaluates the roles of biopharmaceutical factors in the pharmacokinetics of drugs. The last section introduces the students to hands-on pharmacokinetics analysis and modeling using an industry-standard software package.

PHR 616. Cancer Physiology and Pharmacology. 3 Hours.
This course will introduce different types or classes of chemotherapeutic agents currently used in the clinic for the treatment of cancer. These include classic chemotherapeutic agents and newer targeted agents. Students will learn the latest cancer chemotherapy and treatment strategy. Students will also learn historical aspects of cancer treatment and of drug development for this disease. Team projects will prepare students to participate in literature reviews, presentation preparation and skills, and approaches to preparing for scientific discussions and Q&A sessions.

PHR 617. Neuropharmacology. 3 Hours.
This course will introduce the student to the use, mechanism of action, and physiological properties of major families of drugs that affect the autonomic nervous system (ANS) and central nervous system (CNS). Lectures will provide an overview of ANS, CNS, and pharmacology of related diseases. Mechanisms and actions of different drugs used in these systems will be discussed. Both classical and newer classes of drugs will be discussed for their therapeutic value and use in different research settings. This course will be taught using a combination of traditional didactic lectures and student participation through discussions.

PHR 696. Special Topics. 1-3 Hour.
Special Topics in Pharmacology.

PHR 701. Adv Prin Pharm-Sys&Pharmacok 1. 3 Hours.

PHR 702. Adv Prin Pharm-Sys&Pharmacok 2. 3 Hours.

PHR 706. Special Topics in Pharmacology. 3 Hours.

PHR 715. Pharmacokinetics and Biopharmaceutics. 3 Hours.
Pharmacokinetics is the study of the time-course of drugs in physiological systems. This includes the fate of administered drugs in relation to time starting with absorption, through distribution, and elimination. Pharmacokinetics is fundamental to the understanding of observed drug effects and responses. This course is divided into three sections that are assessed independently. The first section explores the principles of pharmacokinetics using the compartmental and noncompartmental models of analysis. The second section evaluates the roles of biopharmaceutical factors in the pharmacokinetics of drugs. The last section introduces the students to hands-on pharmacokinetics analysis and modeling using an industry-standard software package.

PHR 720. Laboratory Rotation in Pharmacology. 1-12 Hour.

PHR 735. Nucleotide Metabolism and Chemotherapy. 3 Hours.
Principles, characteristics and therapeutics of nucleotide metabolism. This course is designed for second year and above graduate students.

PHR 744. Protein Mass Spectrometry. 3 Hours.

PHR 752. Pharmacokinetic Analysis. 1 Hour.
The course will provide a detailed introduction to the analysis of pharmacokinetic data preferably generated as part of the student¿s research. Descriptions of the use of appropriate analytical programs and the interpretation of pharmacokinetic data will be the major focus of this course.

PHR 754. Model Sys for Drug Discovery. 2 Hours.
This course will focus on the use of different genetically tractable model systems and their roles in drug discovery and drug development. The course will discuss the properties, benefits and deficiencies of major model systems used in drug discovery including yeast, zebrafish, xenographs, and genetically modified mouse strains.

PHR 755. Translational Pharmacology and Drug Development. 2 Hours.
Translational pharmacology covers the principles and practice of drug development from the laboratory (bench) to the patient (bedside). This course provides an overview of the processes involved in drug development. It familiarizes the student with the drug discovery and development process including types of clinical trials, regulatory requirements and results interpretations.

PHR 790. Pharmacology Journal Club. 1 Hour.
Pharmacology Journal Club.

PHR 798. Doctoral Level Non-Dissertation Research. 1-12 Hour.

PHR 799. Doctoral Level Dissertation Research. 1-12 Hour.
Prerequisites: GAC Z

PSDO - Physician Scientist Dev Courses

PSDO 630. Physician Experience. 2 Hours.
PSDO 630 will provide practical information and experience for highly qualified students considering medical school or other health-care based professional programs. The course will emphasize real world considerations of the clincial professions including acceptance criteria, expected duration of training, average debt and compensation of various specialties. The students will also be given multiple opportunities to interact with individuals from various levels of training and backgrounds to provide focused and nuanced guidance. Finally, the course will incorporate a shadowing experience, providing students the opportunity to observe and interact with practitioners from across UAB in a variety of specialties and settings. Each student will be required to complete documentation for the UAB and Children's hospital, as well as receiving clearance from UAB Employee Health, as well as completing an online HIPAA compliance module. Students are not permitted to shadow until each is complete.

PSDO 698. Master's Level Non-Thesis Research. 1-8 Hour.
Students may perform independent study in a research laboratory setting. This work may contribute toward the concentration credits subject to program director approval.

PSDO 699. Master's Level Thesis Research. 1-8 Hour.
Students perform independent study in a research laboratory setting. This work contributes directly to the completion of the degree and meets the degree requirements for graduation.

PSDO 700. Pathway to Grant Submission. 2 Hours.
This course is designed to give students a basic background in topics necessary to succeed as a physician scientist in today's academic medical environment. Topics to be covered include the NIH funding system, how to write a fellowship, record keeping, authorship and publication, conflict of interest, animal and human subjects, and finding a mentor (Open to MD-PhD, ARISE-MD, and DMD-PhD students).

PSDO 701. Career Development Grant Writing Workshop. 1 Hour.
This course is designed to assist postdocs, residents, fellows, and rising junior faculty with the creation and submission of a K award or equivalent grant application. Topics to be covered include the NIH funding system, how to write a fellowship, how to submit animal protocols, and how to submit IRB forms. Individuals will be given a variety of reading assignments from which they will be expected to participate in group discussions and/or presentations. They will also be expected to prepare a fellowship application that will be submitted to an NIH Funding agency.

PSDO 720. Critical Approaches & Clinical Evaluation of Kidney Disease. 1 Hour.
Enhance knowledge of kidney disease physiology to include expansion of the themes from the Mount Desert Island Biologic Laboratory (MDIBL) course on the "Origins of Renal Physiology" Promote structured critical thinking skills focused on kidney disease. Enhance experimental design skills for the development and testing of new hypotheses. Enhance constructive reviewing skills. Engage in the culture and language of medicine through exposure to a range of clinical experiences. Provide opportunities for PROmoTE scholars and clinical faculty to discuss areas where basic science and clinical medicine intersect and where new information could be beneficial. Expose PROmoTE scholars to clinical problems and a variety of team-based investigation.

PSDO 798. PSDO Non-Dissertation Research. 1-8 Hour.
Non-Dissertation research. Only open to ARISE-MD students.

PSDO 799. PSDO Dissertation Research. 1-8 Hour.
Dissertation research. Only open to ARISE-MD students.
Prerequisites: GAC Z

Anatomical Science

Anatomical Sciences M.S. provides specialized education courses to train students to teach at the college level and thereby help to meet a rapidly growing need for anatomists in multiple health-care focused programs. Students will be exposed to some of the latest innovations in anatomical sciences education, including 3D-anatomy via the use of ultrasound with standardized patients, radiologic anatomy, using CT scans of cadavers, plastinated specimens, and the use of virtual microscopy in histology education.

Master of Science in Anatomical Science

Requirements		Hours
Education Core		
GRD 716	Developing a Teaching Portfolio	2
GRD 750	CIRTL Seminar: How Learning Works	2
ANSC 695	Teaching Practicum	3
ANSC 696	Research Project	1-6
Select one from:		2-3
GRD 752	Introduction to Evidence-based Teaching	
GRD 754	Advanced Evidence-based Teaching	
GRD 756	CIRTL The College Classroom	
GRD 705	Teaching at the College Level	
Anatomy Core		
ANSC 601 & 601L	Human Gross Anatomy and Human Gross Anatomy Lab	5
ANSC 602	Gross Anatomy Supplement (Must be taken twice)	2
ANSC 618	Histology of Mammalian Organ Systems	3
ANSC 655	Neuroscience	3
ANSC 656	Human Embryology	2
ANSC 657	Medical Imaging	1
Total Hours		**26-32**

Courses

ANSC 601. Human Gross Anatomy. 4 Hours.
Course provides a comprehensive survey of the gross anatomy of the human along with functional and applied anatomy as it relates to common clinical findings.

ANSC 601L. Human Gross Anatomy Lab. 1 Hour.
Lab component of Human Gross Anatomy.

ANSC 602. Gross Anatomy Supplement. 1 Hour.
This course provides students with a step-by-step guide to beginning an education-based research project. Students will create their own anatomy education research project following the topics in the course. Topics include: ethics of research, IRB documents, writing a research question and hypothesis, designing a survey, identifying a sample population, reviewing existing literature, appropriate use of statistical tests, and more.

ANSC 618. Histology of Mammalian Organ Systems. 3 Hours.
This course will cover the specialized cell biology and microscopic anatomy for each of teh mammalian organ systems, as well as consider current research with regards to each system. The objective is to understand how cells organize into tissues and organ systems and how these systems function in the body, as well as appreciate the microscopic appearance of cells, tissues and organs.

ANSC 655. Neuroscience. 3 Hours.
Have you every wanted to know where the amygdala sits in the brain, or how the brainstem connects to the thalamus and basal ganglia? Would you like to know about processing in the spinal cord, and how this information is sent to and from the cortex? This course will show you how to find any structure in the nervous system, and how these regions interact to control body movements, give rise to sensory perception, generate emotions and experiences, make decisions, and create personality. Each week will use interactive didactic sessions, anatomical drawing exercises, real brain lab experiences, radiographic imaging, and small group medical case discussions, to break down the brain into manageable components, to see how its outer coverings, blood supply, gray and white matter are structurally and functionally organized to make you who you are. This course may be beneficial for students considering careers in the medical, dental or optometry fields, along with those wanting to pursue graduate research in neuroscience. Students without a general neuroscience background may consider taking NBL 230 or PY 253 (recommended but not required).

ANSC 656. Human Embryology. 2 Hours.
This course uses didactic lectures, lab exercises and student presentations to help students gain an understanding of the major events in human development from gastrulation to birth. Individual units focus on the developmental processes of specific organ systems. the course uses an anatomical focus to describe the morphological characteristics of the developing embryo/fetus. The biochemical and molecular biology of development are only briefly discussed. morphology and anatomy are also related to clinical presentation of birth defects. Offered summer terms.

ANSC 657. Medical Imaging. 1 Hour.
Students will learn to obtain and interpret ultrasound images by practicing techniques on classmates and reading existing ultrasound images. Other radiograph images (X-ray, MRI) will also be used to help students understand planar anatomy and its relationship to 3D anatomy. Students will learn the basics of the technology behind the different medical techniques to provide a fuller understanding of image interpretation.

ANSC 695. Teaching Practicum. 3 Hours.
Students will act as supplemental instructors in a variety of anatomy lab courses, complete their own (or in teams) whole-body prosection, and prepare and present 2-3 hours of new lecture content for anatomy.

ANSC 696. Research Project. 1-6 Hour.
Students will develop an original research project in medical education, clinical anatomy, or other anatomy research. Students will be evaluated on their ability to formulate an anatomically relevant research question, review the existing literature, and communicate their findings via a poster or oral presentation to department.

ANSC 697. Special Topics: Anatomy. 2 Hours.
Students will read and discuss current literature in anatomy education.

Graduate Biomedical Sciences

The University of Alabama at Birmingham offers a large and diverse community of scientists focused on innovation in modern biomedicine. The thrill of discovery is evident across campus—UAB routinely ranks among the top research-intensive universities for extramural funding and research productivity.

The Graduate Biomedical Sciences (GBS) Doctoral Training Program is designed to provide students with rigorous, interdisciplinary education and mentorship in a wide array of scientific disciplines. GBS trainees can perform doctoral research in more than 350 different labs across campus. Because of the program's scale and the number of affiliated faculty, it is subdivided into eight individual themes that provide discipline-specific training and opportunities for smaller-scale connections within the overall community.

Interdisciplinary Themes:

Biochemistry & Structural Biology (BSB) Theme (p. 178)

Cancer Biology (CANB) Theme (p. 179)

Cell, Molecular, & Developmental Biology (CMDB) Theme (p. 180)

Genetics, Genomics, & Bioinformatics (GGB) Theme (p. 180)

Immunology (IMM) Theme (p. 181)

Microbiology (MIC) Theme (p. 182)

Neuroscience (NESC) Theme (p. 183)

Pathobiology, Pharmacology, & Physiology (P3) Theme (p. 184)

For a full listing of GBS Faculty, visit here.

Completion of the training requirements in one of the above interdisciplinary themes provides eligibility for conferral of one of the following PhD degrees:

- Biochemistry and Molecular Genetics
- Cell Biology
- Cellular and Molecular Physiology
- Genetics
- Microbiology
- Neurobiology
- Pathology
- Pharmacology and Toxicology

If you have any further questions, please contact the following GBS Office Staff or visit the GBS website.

GBS-Grad Biomedical Sciences Courses

GBS 700. Molecular Neurodegeneration. 3 Hours.
Advanced Course. This course covers several of the most important molecules involved in neurodegenerative disease, including A#, tau, apoE, TDP-43, #-synuclein, LRRK2, prion protein (PrP), and Huntington (HTT). The goal is to develop a deeper understanding of each protein's normal structure/function and how these are altered in neurodegenerative disease.

GBS 701. Core Concepts in Research: Critical Thinking & Error Analysis. 1 Hour.
Do you love to "think science"? Would you enjoy looking at scientific questions through an unusual lens? Do you find stories about scientific discoveries fascinating, and would you like to learn more about what they mean to our scientific practice? Then this course is for you! This course examines the natural and philosophical foundations of science using an interdisciplinary approach that emphasizes critical thinking and storytelling; discusses the principles of good scientific practice (rigor, reproducibility and responsibility; the 3R's) - by exploring revolutionary discoveries in the life, public health and natural sciences; elaborates the relationship between theory, practice and serendipity in scientific discovery, and concludes with a discussion of the role of scientists in society.

GBS 702. You Teach Me. 3 Hours.
Advanced Course. You Teach Me: Autoimmune Effector Mechanisms and Inflammation in Type 1 and 2 Diabetes. This course will begin with a general overview of Type 1 and 2 diabetes, but in later weeks, students are given the opportunity to teach and describe a particular cell type and/or immune effector molecule that pertains to Type 1 or 2 diabetes pathogenesis. The teaching topic is for the presenter to decide, but the course master will provide guidance and input. Does your favorite immune cell or effector molecule have a role in the pathogenesis of Type 1 or 2 diabetes? You will be surprised at what you uncover.

GBS 707. Basic Biochemistry and Metabolism. 2 Hours.
Core course. This course is intended to provide students a rigorous background in the principles of biological chemistry. The principles taught are those we believe student should master and include the application of these principles to research protocols and performance.

GBS 708. Basic Genetics and Molecular Biology. 2 Hours.
Core course. This course is intended to provide students with a strong foundation in basic genetics and basic molecular biology so that students are able to apply and understand fundamentals in their lab research.

GBS 709. Basic Biological Organization. 2 Hours.
Core course. This course is intended to provide students with exposure to the fundamentals of basic cell biology and begin to build a foundation of knowledge that will be needed as the student progress along the scientific path.

GBS 710. Cell Signaling. 2-3 Hours.
Module Course. This course covers major extracellular and intracellular signal transduction cascades that regulate animal development and physiology. Topics include the mitogen activated protein kinase cascade, transforming growth factor beta, insulin, and cytokines.

GBS 712. Cellular and Molecular Aspects of Developmental Biology. 2-3 Hours.
Module Course. The goal of this course is to provide an introduction to the fundamentals of vertebrate developmental biology. The course will consist of faculty lectures and research paper discussion groups covering a broad range of developmental issues from fertilization to organogenesis.

GBS 714. Developmental Neuroscience. 2-3 Hours.
Module Course. The course will utilize the scientific literature and faculty lectures to cover a broad range of topics related to the mechanisms of building a brain. The topics covered range from neural induction in early development, to axonal guidance and synapse formation, to neuro-gial interactions in the adult nervous system.

GBS 715. Skeletal Development and Disease. 3 Hours.
Advanced Course. This class is designed for understanding Cellular and Molecular Signaling essential for the normal development and remodeling of skeleton and for learning genetic mechanisms associated with skeletal diseases and pathology.

GBS 716. Grantsmanship and Scientific Writing. 2-3 Hours.
The objective of the course is to teach students how to effectively write grant proposals. This course will provide hands on training in the preparation of a grant application and demonstrate effective strategies for assembling a successful proposal. With guidance from the faculty, the students will write a NIH style proposal on their dissertation research topic. After the proposal is complete, each grant will be reviewed in a mock NIH study section. Based on the comments from the study section, the student will revise the application and submit the proposal to his/her thesis committee as part of the qualifying examination for admittance into candidacy.

GBS 717. Methods and Scientific Logic. 1 Hour.
Methods and Logic in Science is a literature-based class in which students have to critically analyze primary research publications. The students will be expected to critique the thinking processes that went into the experimental design, interpretation, and presentation of the papers selected. Through this exercise, it is expected the students will learn to critically evaluate the experimental design and data interpretation, to improve their logical reasoning skills, and to understand the peer-review process behind scientific publication.

GBS 718. Histology of Mammalian Organs and Tissues. 3 Hours.
Advanced Courses. This course will cover the specialized cell biology and microscopic anatomy for each of the mammalian organ systems, as well as consider current research with regards to each system. The objective is to understand how cells organize into tissues and organ systems and how these systems function in the body, as well as appreciate the microscopic appearance of cells, tissues and organs.

GBS 720. Genomic Sciences. 2-3 Hours.
Module Course. This course will cover a wide variety of topics related to this topic, including genetic variation and polymorphisms, alternative splicing, microRNAs, and novel sequencing and microarray technologies.

GBS 722. Bioinformatics. 2-3 Hours.
Module Course. This course will cover a wide variety of different bioinformatics applications, which will be taught through using bioinformatics resource websites. The topics covered will include: introductions to large-scale, generic databases at NCBI, European Bioinformatics Institute, SwissProt, PDB, UniProt and Ensembl; Sequence analysis systems such as BLAST; statistical genetics; use of R/Bioconductor in research; super computing; Systems Biology; brief introduction into programming languages; resources that are used in Next Generation Sequencing (NGS) analysis, which includes variant discovery, transcriptomics, ChIP-Seq, epigenetics, micro-RNA, de novo assembly, microbiome and metagenomics.

GBS 723. Model Systems for Genetic Analyses. 2-3 Hours.
Module course. This course is designed to introduce various genetic model systems to students. The model organisms discussed in this course include bacteria, yeast, plants, worm, fly, killifish, zebrafish, chick, frog and mouse. Students will learn about the basic physiology and genetic manipulation tools for each organism. There will be one lecture highlighting the strength of each model organism. The students will also learn how to use induced pluripotent stem (iPS) cells in disease models.

GBS 724. Principles of Human Genetics. 2-3 Hours.
Module Course. This course will cover the general concepts of human genetics, including population genetics, dominant, recessive, X-linked, multifactorial, and mitochondrial inheritance and disease, as well as cytogenetics, chromosomal abnormalities, molecular genetics, and triplet repeat disorders.

GBS 725. Grant Writing- Crafting a Research Proposal. 1-3 Hour.
This course is designed to educate students on the best practices of research proposal preparation and review. Several grant mechanisms will be discussed, but the primary focus will be on preparation of NIH "F30/F31 style" proposals. These are six page research strategies focused on the research project of each student. Each week, the class will meet and discuss individual portions of the proposal (e.g. Aims, Significance, Strategy), and student will draft those sections during the intervening week. By the tenth week of the course, students will submit a complete research portion of an F30/F31 grant. These proposals will be reviewed by peers as well as by faculty members of a "live" study section to be held on the last day of class. After completion of the course, students will have substantial critiques of their proposals in hand. It is expected that students will revise these proposals and submit them to committee members as the written portion of the student's qualifying exam. Long term benefits of careful, critical grant preparation extend to many future career paths. Near term benefits of this course are to improve students' writing skills and progress into written qualifying exam. Finally, it is expected that these proposals will be submitted to one or more extramural funding agencies to support the students' training.

GBS 726. Advanced Medical Genetics and Genomics. 3 Hours.
Advanced Course. This course will focus on the medical application of advances in genetics and genomics. Topics include chromosome structure and function and major types of chromosomal abnormalities, cancer genetics and cytogenetics, inborn errors of metabolism, current strategies for detection of mutations associated with genetic disorders, genetic risk assessment and population genetics, and genomic approaches to diagnosis and risk stratification.

GBS 727. Advanced Human Genomics. 3 Hours.
Advanced Course. This course will cover the conceptual basis, major discoveries, and unsolved problems in human genomics, with an emphasis on disease applications. The goal is to make students conversant with the structures, functions, and natural histories of human genomes, the computational and experimental methods used to establish that knowledge, the applications of genomics to medical research, and the broader impacts of genomic research on the community. Each topic will be covered by an approximately 90-minute lecture from a subject-specific PI coupled to reading of pieces of primary literature. Students will also participate in 3 student-led journal clubs in which one or more papers are discussed in detail with the help of the teaching faculty. We will also perform 3 interactive sessions to teach basic computational skills in Unix, Perl and R. Grading will be determined by: discussion interaction, computational problem sets due in weeks 4, 6, and 8, and a “final” project in which students perform a small but cohesive set of bioinformatic analyses to address a question of their choosing, subject to approval/ discussion with the teaching faculty. Format: Each of the 7 weeks will include two, 90 minute lectures performed at UAB. In weeks 2, 4, and 6, we will convene at HudsonAlpha for four-hour sessions. Each four-hour session will include ~1 hour of paper discussion, ~1 hour of teaching on a relevant computational topic, and ~2 hours of hands-on interactive data manipulation with commonly used data types and computational tools. Course meets both on UAB Campus and at Hudson-Alpha in Huntsville.

GBS 728. JC- Bio-Nano Technology. 1 Hour.
This journal club will focus on the use of biological materials as paradigms, structural scaffolds, and active elements of nanoscale materials.

GBS 729. Translational Approaches in Neurodegeneration. 3 Hours.
Advanced Course. With the current emphasis on "bench to bedside" strategies, successful translational research approaches may be helpful for a productive career in academic and industrial settings. This course uses the field of neurodegeneration as a vehicle for conceptualization to the failures, current challenges, and successes of different translational approaches. This course emphasizes active learning principles by placing students into scenarios of direct relevance to a career in science (e.g., emulation of study section discourse, formal critical debate that happens at international symposia, and informal discussions between colleagues).

GBS 730. Introduction to Neurobiology (Dauphin Island Course). 1-9 Hour.
Hands on experiments and classroom lectures onsite at the Dauphin Island Sea Lab. Students live onsite the entire course.

GBS 733. Diseases of the Nervous System. 2-3 Hours.
Major advances have been made in understanding diseases of the nervous system at a cellular and molecular level. Several new findings have had direct therapeutic implications and have resulted in the development of novel drugs or new disease management strategies. This course intends to review the most common brain and CNS disorders.

GBS 736. JC- Cognition. 1 Hour.
Journal club exploring various literature on cognition and cognitive disorders.

GBS 737. Neuro Student Summer Seminar Series. 1 Hour.
This seminar series features neuroscience graduate students presenting their research to their peers.

GBS 739. Neuropharmacology. 3 Hours.
Advanced Course. This course which will focus on the mechanism of action of CNS-active drugs. The first one-third of the course will consist of lectures that emphasize basic principles of neuropharmacology including neurotransmitter and receptor concepts, pharmacokinetics, pharmacodynamics and pharmacogenomics. The next two-thirds of the course will focus on the mechanism of action of different drug classes, including classical behavioral and biochemical studies, as well as genetic and molecular analyses of drug action. In each section, the instructor will give an overview lecture followed by student presentations. Student performance will be evaluated based on homework, oral presentation and written examination.

GBS 740A. Introduction to Immunology Part 1. 2-3 Hours.
Module Course. Introductory Immunology is a team-taught survey course that covers basic concepts of innate and adaptive immunity. These integrated series of lectures provide a firm foundation in immunology, especially for those with minimal immunology background, and serve as an important refresher for the developing immunologist.

GBS 740B. Introduction to Immunology Part 2. 2-3 Hours.
Module Course. Introductory Immunology is a team-taught survey course that covers basic concepts of innate and adaptive immunity. These integrated series of lectures provide a firm foundation in immunology, especially for those with minimal immunology background, and serve as an important refresher for the developing immunologist.

GBS 741. Lymphocyte Biology. 2-3 Hours.
Module Course. The objective of this course is to provide first year immunology students with the opportunity to gain a more in-depth understanding of selected aspects of lymphocyte biology. Possible topics include T cell subsets, B cell biology, lymphocyte activation, and transplantation immunology. The course is literature intense, and students are required to read and present numerous scientific papers.

GBS 742. Dendritic Cell Biology. 3 Hours.
Dendritic cells (DCs) are considered the bridge between the innate and the adaptive immune system. After recognizing pathogens in infected tissues, activated-DCs migrate into the secondary lymphoid organs where they prime pathogen-specific T cell responses. In the absence of DCs, T cell responses are not generated and protective immunity to pathogens, tumors, and vaccines are severely compromised, thus highlighting the importance of DCs in generating effective immune responses. In this course we will provide a comprehensive overview of DC biology, focusing on understanding DC heterogeneity, mechanisms of action and the roles played by the different populations of DCs during viral and allergic responses. The class will also focus on key functional differences between human and mouse DCs and the potential therapeutic use of DCs in immunotherapy.

GBS 744. Mucosal Immunology. 2-3 Hours.
Module Course. The mucosal immune system is essentially the primary site of interaction between invading pathogens and the immune system. Mucosal immunity has always been a strength of the immunology community at UAB and is rarely covered at most other institutions. This class will provide in-depth analysis of the structural features that distinguish the mucosal immune system from the peripheral immune system. Features of innate and adaptive immunity as they relate to mucosal immune responses will also be covered. The course will involve student presentations on selected topics.

GBS 746. GBS Special Topics. 1-4 Hour.
Varying topics offered to advanced graduate students in the GBS program.

GBS 746J. Exercise Medicine Journal Club. 1 Hour.
Exercise training in various forms induces a complex array of coordinated cellular and molecular processes that improve symptoms and co-morbidities associated with numerous chronic conditions including musculoskeletal, cardiorespiratory, metabolic, immunologic, and neurologic disorders—and disease risks associated with chronic physical inactivity are widespread. Understanding the biological mechanisms underlying exercise-induced adaptations and their clinical utility in disease treatment and prevention is therefore a truly interdisciplinary effort. Students will interact with scientists and clinicians from several disciplines, and will present and discuss the latest and most impactful exercise-based research in both human and animal model systems.

GBS 747. Special Topics. 1-6 Hour.
Varying topics offered to advanced graduate students in the GBS program.

GBS 747J. JC- Circadian Rhythms & Sleep Machine. 1 Hour.
In this journal club, we will bring together researchers with diverse perspectives, specialized techniques, and scientific backgrounds in order to develop a take-home message from recent circadian and sleep literature that may be applicable to all of our specific fields. Nearly all organisms possess an endogenous circadian clock that governs a wide array of rhythms, from biosynthetic to behavioral, and synchronizes (entrains) them to the 24-h environmental day-night cycle. The central circadian clock in the suprachiasmatic nucleus of the hypothalamus orchestrates rhythms in many peripheral clocks located throughout the brain and body, resulting in 24-h regulation of many physiological processes (including sleep and reproduction, metabolism, organ function, and seasonal behaviors). This regulation allows for a predictive, rather than purely reactive, homeostatic control. In humans, dysregulation of the circadian system has been implicated in some insomnias, cancers, affective disorders, and in aging and cognitive impairment. The discovery and characterization of oscillating “circadian clock” genes during the last decade has been largely due to cross-talk between researchers working on fruitflies and mice; this approach fueled insights into the likely design principles underlying the intracellular oscillatory machinery. Similar discussion and collaboration at a systems level of analysis may lead to new discoveries and approaches.

GBS 748. Special Topics. 1-4 Hour.
Varying topics offered to advanced graduate students in the GBS program.

GBS 749. Mitochondria in Health, Disease & Toxicology. 3 Hours.
Advanced Course. The course will consist of lectures given by faculty members on specific topics in the field of mitochondrial biology and toxicology. These lectures will be complemented by student presentations of original research articles, which are related to the presented subject matter and that place the discussed topic into the context of human health, disease, and toxicology. This format will allow for students to gain a solid understanding of normal mitochondrial physiology, which they can then use to explore the literature to reveal the importance of mitochondrial dysfunction in human diseases and toxicology responses.

GBS 750. Intro to Physiology. 2-3 Hours.
Module Course. This course will include an overview of basic cellular physiology and the neurological and musculoskeletal systems. Neurologic and neuromuscular diseases such as Parkinson's, multiple sclerosis, and myasthenia gravis will be discussed, along with primary myopathies (e.g., dystrophinopathies), joint diseases (osteoarthritis, acute arthritis, arthropathies, fibrosing disorders), and bone diseases (osteoporosis, osteopetrosis, osteonecrosis).

GBS 751. Intro to Physiology II. 2-3 Hours.
Module Course. Course will introduce the exquisitely integrated cardiovascular, respiratory, and renal systems. This integration will be reinforced with examination of numerous disease states (acidosis, hypertension, heart failure, atherosclerosis/chronic vascular inflammation, genetic and environmentally-induced pulmonary diseases, chronic kidney disease).

GBS 752. Intro to Pathobiology. 2-3 Hours.
Module Course. This course will examine the physiology and pathobiology of the gastrointestinal tract, followed by sub-modules focused on endocrinology and immunology. Students will learn how the endocrine system integrates homeostasis of multiple organ systems through a comprehensive approach—influencing all systems examined in the previous modules. The mechanisms and consequences of abnormal GI function (e.g., peptic ulcer disease, diarrhea), endocrine dysregulation (type II diabetes mellitus, gigantism, hyperthyroidism, Cushing's syndrome), and immune dysfunction (HIV, rheumatoid arthritis, type I diabetes mellitus) will be discussed. The course is divided into three blocks (GI, Endocrine, & Immune)—each with a block leader.

GBS 753. Intro to Pharmacology & Toxicology. 2-3 Hours.
Module Course. Students taking this course will be expected to have a thorough understanding of normal and abnormal organ system function as discussed in the three-modules described above. Lectures will build on that foundation to cover recent advances in drug design and development based on approaches of molecular pharmacology and molecular medicine. In addition, drug targeting strategies that take advantage of specificity in cellular structure and cell signaling processes will also be discussed.

GBS 754. Autophagy in Disease and Medicine. 3 Hours.
Advanced Course. This course reviews the pathobiology of autophagy and how it is essential for survival, differentiation, development, and homeostasis and how it serves an adaptive role to protect organisms against diverse pathologies, including infections, cancer, neurodegeneration, aging, and heart disease.

GBS 756. Cardiometabolic Disease Journal Club. 1 Hour.
The review of recently published articles focused on understanding the complex gene-environment interactions that contribute towards common metabolic diseases, such as obesity, diabetes, and cardiovascular disease. Articles most commonly reviewed range from the whole organism (e.g., physiology, energy balance, metabolism, endocrinology, genetics) to individual cells (e.g., cellular metabolism, signal transduction, and transcriptional regulation), in both animal models and humans. In addition, articles investigating novel lifestyle (e.g., diet and/or exercise), pharmacological (e.g., appetite suppressants), and surgical (e.g., gastric by-pass) interventions designed to treat cardiometabolic diseases are routinely discussed.

GBS 757. Biology of Disease. 3 Hours.
Advanced Course. Biology of Disease is a comprehensive course in general pathophysiology designed for graduate students in the GBS program or other science related graduate programs. This course will begin with an overview of general anatomy and histology and then will investigate basic pathophysiologic principles emphasizing pathogenic mechanisms and clinically important diseases where current research areas will be highlighted. The biomedical science students will learn the mechanisms involved in disease processes and will develop an understanding of diseases and clinical medicine to help them converse knowledgeably with medical colleagues and target their research towards clinically relevant issues.

GBS 758. Cardiovascular Biology. 2-3 Hours.
This course will consist of didactic lectures given by faculty members from UAB and guest lecturers from other institutions on a specific topic in the field of cardiovascular biology, which will then be followed up by student presentations of original research articles which are related to the presented subject matter and that place the discussed topic into the context of human health and disease. This format will allow for students to first gain a solid understanding of normal and pathological aspects of cardiovascular physiology, the basic experimental approaches that can be used in bench to bedside studies and the current perspectives on a broad range of current hot topics in the field. In addition, this course has unique components including instruction on how to review a research paper and prepare for an interview for an entry level position (e.g. postdoctoral) in academia and/or industry. These exercises will provide an appreciation of the issues related to a career scientific research. This course will be guided by the Course Director and other faculty members who will assist in the selection of relevant readings and facilitate in-class discussions among the students.

GBS 760. Bacterial Genetics and Physiology. 2-3 Hours.
Module Course. This course is designed to familiarize students with advanced knowledge in recombination, transcription, translation, regulation of gene expression, transport mechanisms and protein export. The students will learn the fundamental principles how structural components of bacterial cells are built and how bacteria-specific metabolic pathways can be exploited by antibiotics. We will also cover state-of-the-art technologies such as whole genome sequencing, microarray experiments, methods to analyze protein-protein interactions and the metabolome of bacteria. In this course, we emphasize the training of critical thinking and foster the ability of the students to design their own experiments to solve scientific problems in bacteriology. The goal of the course is to provide a strong foundation for advanced bacteriology classes and for doing research in any bacteriology lab.

GBS 762. Virology. 2-3 Hours.
Module Course. This course is designed to familiarize students with the general steps involved in viral lifecycles and use this knowledge as a framework for understanding the similarities and differences in the lifecycles of (+) and (-) stranded RNA viruses, DNA viruses, and retroviruses. The course also covers the role of viruses in oncogenesis, the origin and evolution of viruses, the innate immune response to viral infections, and the development of antiviral chemotherapeutics. The goal of the course is to provide a strong foundation for advanced virology classes and to provide students with enough background in virology to be comfortable teaching in a college level microbiology class.

GBS 763. Microbial Pathogenesis. 2-3 Hours.
Module Course. The course in Bacterial Pathogenesis contains introductory lectures that provide an overview of major concepts including virulence factors, and host immune mechanisms. Most of the lectures describe the unique aspects of specific bacterial (and fungal) pathogens. Although many of the most important medical pathogens are covered, the course focuses especially on those bacterial and fungal pathogens studies most intensively at UAB. Each week students will be given a quiz based on the lectures of the preceding week. To answer the questions, an understanding of the lecture material will be needed. The questions are designed to help the students thinking about hypotheses and concepts in Bacterial Pathogenesis.

GBS 764. Introduction to Structural Biology Methods. 2-3 Hours.
Module Course. Structural biology is central to understanding the function of biological macromolecules and is to relevant to all fields of modern biological science. This course will provide a basic introduction to the elements of structural biology including the levels of protein structure (primary, secondary, tertiary, quaternary), the basis of structure determination by X-ray crystallography, NMR, and cryo-electron microscopy, and will explore the structure/function relationships in select systems.

GBS 765. Hybrid Structural Techniques as Applied to Cellular & Molecular Biology. 3 Hours.
Advanced Course. This course will focus on the use of X-ray crystallography, Cryo-Electron microscopy and Image Reconstruction, NMR, and Mass Spectrometry to obtain structures of biological macromolecules. Each component will be taught separately. Each module will focus on insuring the student has a basic understanding of the essential principles of the technique and its practical application. Examples will generally be drawn virology and immunology.

GBS 766. JC- Inflammation. 1 Hour.
Inflammation Journal Club presents the state of the art papers that fall broadly in the area of inflammation, which include aspects of basic cellular and molecular mechanisms, animal models and immunopathology of human diseases including, infectious diseases, cancer and chronic lung diseases.

GBS 768. Communicating Science: Reading, Writing and Presentation. 2-3 Hours.
This course will teach students how to make formal scientific oral presentations and how to write a paper for publication in a scientific journal.

GBS 769. Carcinogenesis. 2-3 Hours.
Module Course. The course is intended to introduce the concepts in carcinogenesis, followed by understanding the etiology, molecular events and signaling pathways involved.

GBS 770. Pathobiology of Cancer. 2-3 Hours.
Students will gain an understanding of the pathology of cancer in general and an appreciation of the gross, histologic and molecular pathology of cancers of multiple organs. The students will learn the basis of the pathologic classification of various cancers, as well as the clinical implications (i.e., prognostication and treatment). Translational research in cancer will also be discussed. Additionally, current controversies and topics of research interest may be introduced.

GBS 774. Cancer Immunology. 2-3 Hours.
Module Course. A summary of key signaling pathways that regulate cancer cell growth, death and behavior will be presented. An intense evaluation of mechanisms involved in pro-and anti-tumor immunology will be presented along with theoretical aspects of cancer immunotherapy.

GBS 775. Cancer Treatment. 3 Hours.
Advanced Course. Students will study current theories regarding chemotherapy, radiation therapy, chemoprevention and imaging. Students will also be exposed to state-of-the-art for each of these treatment/diagnostic modalities. This course uses a combination of textbook and literature readings and classroom discussions to provide students with an understanding of the different classes of drugs used to treat cancer. The course focuses on the mechanisms of drug action, the basis for selectivity and therapeutic applications. Traditional as well as novel approaches to therapeutics will be discussed, as well as the role of drug resistance and strategies for its management.

GBS 776. Cancer Biology Journal Club. 1 Hour.
This journal club focuses on current topics in all areas of Cancer Biology. Each week, a student will present and discuss a recently published paper related to a selected monthly cancer theme. All students are expected to actively participate in the discussion. The goals of this course are to enhance one's ability to critically read the literature, to stay abreast of current findings, and to improve presentation skills.

GBS 777. Cancer Biology Seminar. 1 Hour.
Required of Cancer Biology Theme students. Seminars on various topics in cancer biology or other biomedical science topics. Students will attend a seminar offered by a Joint Health Sciences department/theme, keeping a journal that includes each seminar date, title and a brief synopsis of the seminar. Journals are to be kept electronically and emailed in on time. Anyone turning in a journal after deadline will receive NP for the course. Students may include no more than 2 student public defenses as a seminar entry each semester.

GBS 778. Cancer Metastasis. 3 Hours.
Advanced Course. The majority of cancer associated deaths are due to complications arising from metastatic disease. The process of metastasis is highly selective and is the result of a tumor cell completing a series of complex interrelated steps. Despite our improved knowledge of this disease, we still do not fully understand the molecular mechanisms regulating tumor progression and metastasis. This advanced course will cover basic mechanisms of how a tumor cell progresses from growth at the primary site to forming an overt lesion in a secondary organ and techniques used to study this disease.

GBS 779. Translational Research in Cancer. 3 Hours.
Advanced Course. This course covers topics on patient-based research efforts that may be important adjuncts to basic science studies. Topics include tissue collection, ex vivo assays, animal models, high-throughput arrays, drug development, epidemiologic studies, basics of clinical trials, and other topics.

GBS 781. Molecular Enzymology. 2-3 Hours.
Module Course. Course intends to touch on the various mechanisms of enzymes in biological systems.

GBS 782. Molecular Genetics. 2-3 Hours.
Module Course. Course studying the structure and function of genes at a molecular level.

GBS 783. Advanced RNA Biology. 3 Hours.
Course exploring the biology, biochemistry, structure and function of RNA at a research level.

GBS 784. Stem Cell Biology. 2-3 Hours.
Module Course. This course will explore the derivation, manipulation, and differentiation of embryonic, fetal, and adult stem cells in both mice and humans. Topics to be discussed include stem cell self-renewal, teratoma formation, hematopoietic stem cells, neural stem cells, trans-differentiation, nuclear transfer, and reproductive and therapeutic cloning. The course will be a mixture of instructor lectures and interactive journal club style presentations from the current stem cell literature by the students.

GBS 786J. Journal Club in Structural Biology. 1 Hour.
The journal club will discuss peer-reviewed scientific articles of interest to the structural biology community. In general, the majority of articles will contain macromolecular structural data determined by one or more of the following methods: X-ray crystallography, cryo-EM, NMR and Mass Spectroscopy. It will help students become familiar with our present understanding of the structure/function for different classes of macromolecules and gain an appreciation of state-of-the-art biophysical techniques available to determine macromolecular structures.

GBS 787. Special Topics. 1-4 Hour.
Varying topics offered to advanced graduate students.

GBS 788. Special Topics. 1-4 Hour.
Varying topics offered to advanced graduate students.

GBS 789. Evolutionary Developmental Biology. 2-3 Hours.
The class is aimed at introducing the concepts of evolution and describing how changes in gene expression and function during embryonic development represent the central molecular mechanism underlying evolution.

GBS 790. Clinical Evaluation of Cognitive Disorders. 2 Hours.
This course will provide clinical exposure to the evaluation and care of patients with cognitive disorders through a combination of didactic sessions and practicum visits, including observation of visits for patients with developmental and age-related cognitive impairment, neuropsychological testing, and functional MRI.

GBS 791. Graduate Neuroscience Journal Discussion. 1 Hour.
Students will participate in journal club style discussion on current topics in neuroscience research and develop presentation skills.

GBS 792. CMDB Seminar. 1 Hour.
Seminars on various topics in cellular and molecular biology or other biomedical science topics. Students will attend a seminar offered by a Joint Health Sciences department/theme, keeping a journal that includes each seminar date, title and a brief synopsis of the seminar.

GBS 793. Alzheimer's and Frontotemporal Dementia Journal Club. 1 Hour.
Discussion of important current research on Alzheimers disease and frontotemporal dementia, with a focus on basic and translational science.

GBS 794. Lab Rotation 4. 1-9 Hour.
Rotation for students needing a fourth rotation.

GBS 795. Lab Rotation 1. 1-9 Hour.
First rotation for first year GBS Theme students.

GBS 796. Lab Rotation 2. 1-9 Hour.
Second rotation for first year GBS Theme students.

GBS 797. Lab Rotation 3. 1-9 Hour.
Third lab rotation for first year GBS theme students.

GBS 798. Non-Dissertation Research. 1-12 Hour.
Lab hours for students in the GBS Theme who have not entered candidacy.

GBS 799. Dissertation Research. 1-12 Hour.
Lab hours for students in the GBS Theme who have entered candidacy.
Prerequisites: GAC Z

GBSC-Grad Biomedical Sciences Courses

GBSC 700. Journal Clubs. 1 Hour.
Journal Clubs.

GBSC 701. Seminars. 1 Hour.
Seminars.

GBSC 703. Bioinformatics Courses. 1-6 Hour.
Various Bioinformatics courses.

GBSC 704. Practical Course in Cryo-Electron Microscopy. 2-3 Hours.
This is a two-week practical course in high resolution electron microscopy (EM) with emphasis on cryo-EM and the preparation and observation of frozen-hydrated particulate samples such as protein complexes, viruses and whole bacterial cells. The first week will cover some theoretical aspects and general EM theory in morning lectures, followed by practicals and demos in the afternoon. The second week will consist of independent, hands-on practical work on the Tecnai F20 cryo-electron microscope. Students have the opportunity to work on their own samples.

GBSC 705. Protein Mass Spectrometry. 3 Hours.
Advanced Course. Students participating in this course become familiar with standard analysis of proteins and protein mixtures by analytical mass spectrometry. This includes the analysis of recombinant and native isolations of proteins including the analysis of post translational modifications. The first month of the course will focus on the fundamentals of mass spectrometry and protein analysis and will be open to first year students. The second and third months of the course is followed by an applications section for students who have completed their first year course requirements. Included topics throughout the course include, sample preparation, mass spectrometry instrumentation, mass spectral interpretation, proteomic experimentation, database searching, analysis of protein modifications, targeted analysis of proteins in complex mixtures, and structural techniques in mass spectrometry.

GBSC 706. NMR Spectroscopy. 3 Hours.
Advanced Course. The main purpose of this course is to provide fundamental understanding (physics) to graduate students who want to utilize NMR spectroscopy as a major tool in their structural biology research. Students with elementary Quantum Mechanics background will gain the optimum benefit from this course. The course is offered every two years. This course covers basic NMR Theory and Concepts (Nuclear Spin-1/2, Bloch Equations, FT-NMR, Rotating Frame, Various Relaxation Mechanisms, Chemical shits, J couplings, etc.), Density Matrix Theory, Product Operator Description of 2D- and 3D-NMR, Nuclear Overhauser Effect, Conformational Exchange, Solomon-McConnel equations, Residual Dipolar Couplings, NMR spectra of Amino acids, Peptides and Proteins, Solvent Suppression Methods, Random Coil Chemical shifts, 2D-NMR methods for assignments and structure calculations of peptides and small proteins, 3D/4D-NMR methods for assignment and structure studies of large proteins, CYANA Structure-Refinement calculations, NMR of nucleic acids, Protein Dynamics, and study of Protein-Ligand complexes including applications in drug design (STD-NMR, trNOESY, SAR-by-NMR and ILOE).

GBSC 707. Metabolic Regulation of Gene Expression. 3 Hours.
Advanced Course. This course will focus on the impact of various metabolites on gene expression, cell growth, and differentiation in health and disease. The key topics for discussion will include the types of biologically active molecules in mammalian tissues, the mechanisms that regulate their concentrations at different stages of life, and the mechanisms by which these bioactive molecules regulate gene transcription through binding to nuclear receptors/transcription factors. Primary literature applicable to these topics will be the basis for discussion. Each section on a specific type of signaling molecule will start with an introductory lecture, followed by student presentations focusing on various aspects of the topic. The goal of this course is to familiarize students with the mechanisms of action and diversity of bioactive metabolic compounds that directly affect the expression of proteins at the level of gene transcription as well as mRNA translation during development and in adulthood.

GBSC 709. Advanced Stem Cell Biology & Regenerative Medicine. 3 Hours.
Advanced Course. Patient-specific cell therapies promise to transform medicine in the next two decades. In order for these regenerative therapies to be safe and effective, basic mechanisms of stem cell biology must be better understood. The goal of this course is to provide students with the basic science foundation to contribute to this field and to provide examples of translating this information to next generation medical therapies.

GBSC 710. Advanced Chromatin Biology. 3 Hours.
Advanced Course. Chromatin biology may hold the keys for discovery of novel cures for cancer and other chronic genetic diseases. Chromatin state directly influences the development of regenerative medicine. Over the last few years, there has been an explosion of new insights into chromatin biology. This course will focus on four key topics: chromatin structure and gene regulation, chromatin in cancer biology, chromatin in developmental biology, and practical approaches in chromatin research. The format will be 1/3 lecture and 2/3 student presentations. Primary literature related to these topics will be assigned for discussion. The goal of this course is to help students to understand the cutting edge knowledge in chromatin biology and to be able to address questions on chromatin in their own research.

GBSC 712. Evolution of Immunity. 3 Hours.
Advanced Course. Every form of multicellular life on earth has the capacity to carry out host defense. In higher order vertebrates the necessity for immunity against pathogens has given rise to an elaborate and complex system that involves a variety of specialized cell types and effector molecules. How did this complex system evolve? This course will explore immunity across the animal kingdom with a special emphasis on points of convergent and divergent evolution of immune mechanisms and strategies.

GBSC 713. JC- Epigenetics. 1 Hour.
This course provides the student with an exposure to a wide range of basic epigenetics research topics and will promote scientific literacy, discussion skills, and critical thinking skills. In addition, students will gain experience developing lectures and providing constructive criticisms to their peers.

GBSC 714. Applications of Microscopy. 3 Hours.
Advanced Course. Light and fluorescence microscopy are widespread research tools, used in many biological disciplines. This course focuses on technique fundamentals as well as powerful applications in the study of cellular structures, dynamics, and functions. We will examine how different types of microscopy work, sample preparation, and how to select the best technique for your biological question. A microscopy image is much more than a pretty picture; we will cover image processing, quantitative analysis, presentation, and ethics concerning image manipulation. To further explore the theoretical and practical principles of imaging, students will participate in hands-on microscopy projects.

GBSC 715. Molecular Basis of Disease. 3 Hours.
Advanced Course. This course that explores the molecular and cellular mechanisms that underlie the causes, symptoms, and complications of various diseases, including diabetes, autoimmune diseases, atherosclerosis, and cancer. An integrative approach to the clinical, pathologic, biochemical, and molecular perspectives of diseases is introduced. This will help the students to understand how metabolic pathways, cell cycle regulation, signal transduction, transcription factors, and protein glycosylation impacts on our ability to understand and treat human disease.

GBSC 716. Special Topics. 1-9 Hour.
Various topics in Microbiology.

GBSC 717. Protein/DNA Xray Crystallography. 3 Hours.
Advanced Course. Xray crystallography is an important technique to resolve protein/DNA structures and it requires specialized training. Covered in this will not only be the theoretical aspects, but there will also be hands-on training sessions on each topic. Some topics covered: protein crystallization, data collection and reduction, structure solution, refinement and how to report structures.

GBSC 718. Epigenetics. 2-3 Hours.
This course introduces the fundamentals of epigenetic controls and how epigenetic regulation is being investigated and utilized in basic and translational research. Specifically, students learn of changes in gene expression or cellular phenotype caused by mechanisms other than changes in the underlying DNA sequence. Students also gain an understanding of the differences between genetic and epigenetic influences on gene expression; epigenetic mechanisms that regulate gene expression; how epigenetic modifications are propagated; and the phenotypic consequences of normal versus abnormal epigenetic regulation in disease, development, and evolution.

GBSC 720. Journal Club 2. 1 Hour.
This will house various journal clubs, differentiated by Section numbers. To be considered like a Special Topics course.

GBSC 721. Brain Tumor Biology. 3 Hours.
Advanced Course. This course will review the types of adult and pediatric brain tumors with a focus on 3 major components: 1-cellular genetics and signaling, 2-pro-tumorigenic cellular biology, and 3-preclinical models and clinical treatments. At the end of the course, the student should have a thorough understanding of the changes in tumor vs. normal tissue that promote cancer initiation and growth. The student should understand how these changes provide the foundation for current and cutting edge treatment strategies. The focus will be on gliomas, but other tumors will be discussed.

GBSC 722. Special Topics. 1-9 Hour.
Courses offered for only 1 semester.

GBSC 723. Career Dev Courses. 1-9 Hour.
Various courses relating to Career Development.

GBSC 724. Metabolomics. 3 Hours.
Advanced Course. The goal of the course is to provide training on (1) the new vision of the chemical composition of the metabolome, (2) its impact on phenotypes in normal health and disease, (3) how to design experiments that (a)reduce systematic variation and (b) deal with the effects of the microbiome, (4) recovery of the metabolome from body fluids/excreta, cells and tissues, (5) analytical methods used in metabolomics, (6) post-acquisition data processing and univariate and multivariate statistical analysis, (7) metabolite confirmation, (8) unknown (new) metabolite identification, (9) pathway analysis, (10) targeted quantitative analysis of specific pathways, (11) use of stable-isotopically labeled precursors to measure pathway dynamics, (12) metabolomics in human and animal models of disease (atherosclerosis, cancer, diabetes, eye diseases, immune diseases and neurodegeneration), (13) metabolomics in situ (imaging mass spectrometry and direct analysis in the clinic and the operating room) and (14) integration of metabolomics with other 'Omics (genomics, transcriptomics and proteomics).

GBSC 725. Cancer & Micro Environment. 3 Hours.
Advanced Course. The growth and progression of cancer is closely regulated by the tumor microenvironment. Through this course students will gain a comprehensive understanding of the tumor microenvironment by studying topics that include, for example, the cellular and a cellular composition of the microenvironment, mechanisms of communication between tumor and host cells and how the tumor microenvironment promotes tumor growth, metastasis and drug resistance. Students will also learn the in vitro and in vivo models utilized for studying the tumor microenvironment and current approaches for targeting the tumor microenvironment for cancer therapy.

GBSC 726. Science Communication & Review. 2-3 Hours.
This course will familiarize students on four major components of science communication and review: 1) how to read and review scientific manuscripts, 2) how to review scientific proposals, 3) how to give effective poster presentations and elevator summaries, and 4) how to give an oral research presentation. The course will offer the opportunity for students to be fluent and effective communicators and scientific reviewers.

GBSC 727. Neuro Systems. 2-3 Hours.
Module Course. Systems neuroscience studies how neural circuits and systems work together to create behavior. This course is a short overview of systems neuroscience ideas and concepts, from alpha oscillations to zebra-finch song.

GBSC 728. Cancer Genomics, Epigenetics, & Therapeutics. 3 Hours.
Advanced Course. Recent advances in high throughput technologies have enabled researchers to decipher the genomic and epigenetic alterations in cancer in great detail. In this course “Cancer Genomics and Epigenetics”, students will learn the technologies used for investigating the genomic and epigenetic alterations in cancer and effect of these changes on cancer progression and potential application of understanding these changes. The goal of this course is to provide the students with an exposure to a wide range of high throughput technologies used in cancer genomic research, basic and translational genomic and epigenetics research. In addition, the course will highlight the major discoveries in the area of gene mutations and gene fusions as well as therapeutic targeting some of the critical molecular alteration. This course will give exposures to students to state of the art cancer research topics, promotes scientific literacy, discussion skills, and critical research integration skills. In addition, students will also gain experience in presentation and ideas to develop new projects in cancer genomics and epigenetics research areas.

GBSC 729. Cell Neurophysiology. 2-3 Hours.
Module Course. This course presents the fundamental principles of how nerve cells work. Starting with ion channels themselves, it integrates them into the functioning of individual neurons. The way in which voltage-dependent ion channels act in concert to generate action potentials and synaptic potentials is discussed in the framework of basic physical laws. The mechanisms of transmitter release and the postsynaptic actions of transmitter are studied. The overall aim is to provide students with a quantitative understanding of how individual nerve cells communicate with each other.

GBSC 730. Respiratory Tract Pathogens. 3 Hours.
Advanced Course. This course will examine major bacterial, viral, and fungal pathogens that infect the respiratory tract in humans, each using different mechanisms in attempts to evade host defenses. It will also introduce fundamental aspects of respiratory tract anatomy, lung function, and the clinical approach to patients suspected to have pneumonia. Classes will consist of an introduction to each topic provided by the faculty preceptor followed by a critical analysis of the primary literature in the form of presentations by individual students and in-class discussion.

GBSC 731. Intro to Biostats. 2-3 Hours.
This course is intended to provide graduate students with an introduction to biostatistics. The emphasis in this course will be upon understanding statistical concepts and applying and interpreting tests of statistical inference. Content will include but not be limited to: choosing the correct test for a given research design, data and data files, data screening, scaling, visual representations of data, descriptive statistics, correlation and simple regression, sampling distributions, and the assumptions associated with and the application of selected inferential statistical procedures (including t-tests, Chi-square, and ANOVA). Computer software (SPSS) will be employed to assist in the analysis of data for this course. Students should have access to a computer, SPSS software, and the Internet.

GBSC 732. Advanced Study of Renal Physiology. 3 Hours.
Advanced Course. The objective of this course is to increase familiarity with classic renal physiology terminology, improve understanding of mechanisms for evaluating renal function, and to become familiar with the forefronts in research related to renal physiology and disease.

GBSC 733. Art of Reproducible Science. 2 Hours.
This course is open only to GBS students on a T32 grant. The goal of the Mastering the Art of Reproducible Science course is to advance the visibility and awareness of this critical issue and to equip students to better recognize and eliminate sources of irreproducible data. The course will explore the fundamental causes and consequence of data irreproducibility, discuss best-practice procedures to minimize data irreproducibility, and discuss the responsibility of the scientific community to confront the irreproducibility crisis. The course is structured around 4 month-long modules using a team-based learning strategy.

GBSC 734. Experimental Model Systems, Scientific Stringency and Qualification Exam Preparation. 3 Hours.
Advanced Course. This course is designed to help students gain in-depth knowledge and understanding of a broad range of experimental model systems used in immunology studies. All enrolled students will give a brief presentation of their research projects in the beginning weeks. Then, based on the students' research interests/projects, the experimental model systems that are involved or have the potential to be involved will be identified to form specific topics for the rest of the course.

GBSC 735. Discoveries in Molecular Biology. 3 Hours.
Advanced Course. The aim of the course is to familiarize students with landmark, historical discoveries in biological research. The course will focus on seminal publications in different disciplines, predominantly but not limited to: biochemistry, cell biology and genetics. The course will be organized as student-led discussions of selected papers. In-depth analysis of the presented literature will facilitate gaining broadened knowledge of selected fields and improve capability of critically reading manuscripts. For each publication, special emphasis will be placed on examining the experimental design, interpretation of results, and organization and reporting of the findings. Classes will consist of an instructor-led introduction to the topic and presentation of a historical perspective followed by a group discussion of the paper. An important goal of the course is to help students understand and appreciate principal discoveries.

GBSC 736. Electron Microscopy: Methods & Applications to Cell and Structural Biology. 3 Hours.
Advanced Course. The purpose of this course is to provide an in-depth understanding of electron microscopy (EM) and 3D reconstruction, especially as applied to high-resolution cryo-EM and single-particle reconstruction methods. The course will cover both theoretical and practical aspects of EM, and will incorporate practical use and hands-on training in preparation and imaging on the FEI Tecnai F20 electron microscope and 3D reconstruction with EMAN and Relion.

GBSC 737. Independent Study. 1-3 Hour.
This course is offered to students for special circumstances. See course director for approval.

GBSC 738. HudsonAlpha Courses. 1-3 Hour.
This course is offered to students at HudsonAlpha. See course director for more information.

GBSC 739. Training Grant Course. 1-3 Hour.
This course is offered to students taking training grant initiated courses. See course director for more information.

GBSC 740. Advanced Topics in Bacterial Pathogenesis. 3 Hours.
The Advanced Topics in Bacterial Pathogenesis course provides a detailed examination of major concepts related to host-pathogen interactions. Its primary focus will be the molecular mechanisms responsible for subversion of host defense by pathogenic bacteria. Select topics will be covered in two parts on different dates: 1) a general presentation by expert faculty, 2) student presentations on assigned subtopics in form of a 10-15 minute PowerPoint presentation and handout.

GBSC 741. Fundamentals of Renal Physiology. 3 Hours.
This course objective is to provide detailed understanding of renal physiology through a series of lectures, histology analyses, small group discussion, workshop based study problems, and simulations.

GBSC 742. GBS Student Theme Meeting Course. 1 Hour.
This course will be utilized for GBS theme meeting courses.

GBSC 743. Glycosylation in Health and Disease. 3 Hours.
Glycobiology is the study of the structure, biosynthesis, and biology of glycans. Glycans modulate or mediate a wide variety of cellular functions. Glycoproteins and polysaccharides are also important components of bacterial cells and glycoproteins play important roles in biology of some viruses. The primary aim of this course is to provide a current overview of the fundamental facts, concepts, and methods in Glycobiology with emphasis on aspects relevant to human health and disease. The course will combine faculty lectures, student presentations of selected papers, and discussions. The course will be taught by faculty who have studied different aspects of glycobiology and made seminal discoveries in the field.

GBSC 744. Neuroanatomy. 2-3 Hours.
Module Course. The goal of this course is to familiarize students with the basics of neuroanatomy. The goals are: •Understand the anatomy of the cranial nerves, the visual system, the auditory system, the olfactory system, the limbic system, the cerebrovascular system, neural pathways responsible for movement and cognition. In addition: • Human nervous system anatomy will be compared to rodents and non-human primates and simpler models systems such as C. elegans and zebrafish •Novel techniques such as optogenetics, functional MRI and MATLAB for data analyses to study brain neuroanatomy and connectivity will be discussed. •Sheep brains will be dissected. •Students will view human brain slicing.

GBSC 745. Biology of Respiratory Disease. 3 Hours.
Advanced Course. This course consists of a series of clinical, basic science and journal club formatted lectures designed to provide students with a broad and in-depth knowledge of disease states of the respiratory systems. Lecturers may integrate recent advances in their own laboratories into their lectures; others will use a more classical approach. Handouts and slide presentations will be provided.

GBSC 746. Gene Editing. 3 Hours.
Advanced Course. The purpose of this course is to explore the current research and future therapeutic applications of gene editing technologies, including ZFNs, TALENS, and CRISPR. The format of each class will be a combination of didactic lecture and interactive class discussion directed by the Course Director focused on each day's topic. Reading materials covering each day's preselected topics will be provided by the Course Director in advance of each class.

GBSC 747. Microbial Genetics and Pathogenesis. 2-3 Hours.
This course is designed to: familiarize students with advanced knowledge in bacterial genetics, mutant analysis, molecular biology techniques, recombination, and regulation of gene expression; prepare them to be able to better evaluate the literature about microbial pathogenesis; and to help them better investigate microbial pathogenesis and infectious disease outcomes and treatments. In this course, we emphasize the training of critical thinking and foster the ability of students to design their own experiments to solve scientific problems in bacteriology. The goal of the course is to provide a strong foundation for advanced bacteriology and pathogenesis classes, and for doing research in any bacteriology lab.

GBSC 748. Cellular Metabolism in Health Disease. 3 Hours.
The main goal of this course is to help students to understand the major concepts of metabolism and its regulation under normal circumstances, as well as under certain pathological conditions such as obesity, diabetes, or cancer, for example. Course consists of four major blocks covering: metabolism of carbohydrates and its regulation; metabolism of lipids and its regulation; metabolism of proteins and its regulation; and metabolic interrelationships in health and disease. It involves lectures and in-class exercises. Grading is based on the results of in-class exercises and on the results of written exams.

PHR-Pharmacology Courses

PHR 611. Physiological Principles of Pharmacology & Toxicology. 3 Hours.
This course will provide a broad but rigorous overview of physiological principles of pharmacology & toxicology. The course includes five separate “modules”, each taught by faculty of UAB Dept. Pharmacology & Toxicology. Each module has separate review session(s) and exams. In addition, each module will have small group problem-based learning (PBL) sessions (see below). There will be one exam specific for each module. At the end of the course, students will be assigned a drug from a pre-assigned list and discuss its pharmacology and toxicology, in the form of a PPT presentation. Students will be graded for their performance on exams, completing PBL assessments, student presentation, and participation in live PBL sessions.

PHR 612. Systems Physiology and Pharmacology I. 3 Hours.
This course will introduce the student to the use, mechanism of action and physiological properties of major families of drugs that affect the cardiovascular system, autonomic nervous system (ANS) and central nervous system (CNS). Lectures will provide an overview of nervous system / cardiovascular physiology and pathophysiology that results from various diseases, disorders and injuries, the drugs used to treat these conditions and their mechanisms of action. Both classical drugs and newer classes of drugs will be discussed for both their therapeutic value and also their use in different research settings. This course will be taught using a combination of traditional didactic lectures and student participation through discussion of seminal research papers and presentations.

PHR 613. Systems Physiology and Pharmacology II. 3 Hours.
This course will introduce drug use, mechanism of action and physiological properties of major drug families, with a focus on specific organ systems (endocrine, gastrointestinal and renal systems). In addition, this course will also cover specific classes of drugs for cancer treatment specifically related to the organ systems covered in the course. This course is divided into three “modules”. Each module has its own exam. In addition, there are graded student presentations at the end of the semester, topics of discussion to be determined.

PHR 614. Drug Discovery and Development. 3 Hours.
The course will provide an overview of the drug discovery and development process. Topics will include (among others): Target identification and validation, High-Throughput Screening, Hit discovery, Lead optimization, Preclinical testing, Safety requirements, Clinical trials, IND, NDA, Patents, and Federal regulations. The course will highlight multidisciplinary nature of drug discovery and the roles of biologists, medicinal chemists, pharmacologists, regulatory agencies, and investors in the process. Real-life case stories highlighting successful and unsuccessful drug development examples will be introduced for discussions, as well as some current examples of early stage biotech startups.

PHR 615. Pharmacokinetics and Biopharmaceutics. 3 Hours.
Pharmacokinetics is the study of the time-course of drugs in physiological systems. This includes the fate of administered drugs in relation to time starting with absorption, through distribution, and elimination. Pharmacokinetics is fundamental to the understanding of observed drug effects and responses. This course is divided into three sections that are assessed independently. The first section explores the mathematical principles of pharmacokinetics using the compartmental and noncompartmental models of analysis. The second section evaluates the roles of biopharmaceutical factors in the pharmacokinetics of drugs. The last section introduces the students to hands-on pharmacokinetics analysis and modeling using an industry-standard software package.

PHR 616. Cancer Physiology and Pharmacology. 3 Hours.
This course will introduce different types or classes of chemotherapeutic agents currently used in the clinic for the treatment of cancer. These include classic chemotherapeutic agents and newer targeted agents. Students will learn the latest cancer chemotherapy and treatment strategy. Students will also learn historical aspects of cancer treatment and of drug development for this disease. Team projects will prepare students to participate in literature reviews, presentation preparation and skills, and approaches to preparing for scientific discussions and Q&A sessions.

PHR 617. Neuropharmacology. 3 Hours.
This course will introduce the student to the use, mechanism of action, and physiological properties of major families of drugs that affect the autonomic nervous system (ANS) and central nervous system (CNS). Lectures will provide an overview of ANS, CNS, and pharmacology of related diseases. Mechanisms and actions of different drugs used in these systems will be discussed. Both classical and newer classes of drugs will be discussed for their therapeutic value and use in different research settings. This course will be taught using a combination of traditional didactic lectures and student participation through discussions.

PHR 696. Special Topics. 1-3 Hour.
Special Topics in Pharmacology.

PHR 701. Adv Prin Pharm-Sys&Pharmacok 1. 3 Hours.

PHR 702. Adv Prin Pharm-Sys&Pharmacok 2. 3 Hours.

PHR 706. Special Topics in Pharmacology. 3 Hours.

PHR 715. Pharmacokinetics and Biopharmaceutics. 3 Hours.
Pharmacokinetics is the study of the time-course of drugs in physiological systems. This includes the fate of administered drugs in relation to time starting with absorption, through distribution, and elimination. Pharmacokinetics is fundamental to the understanding of observed drug effects and responses. This course is divided into three sections that are assessed independently. The first section explores the principles of pharmacokinetics using the compartmental and noncompartmental models of analysis. The second section evaluates the roles of biopharmaceutical factors in the pharmacokinetics of drugs. The last section introduces the students to hands-on pharmacokinetics analysis and modeling using an industry-standard software package.

PHR 720. Laboratory Rotation in Pharmacology. 1-12 Hour.

PHR 735. Nucleotide Metabolism and Chemotherapy. 3 Hours.
Principles, characteristics and therapeutics of nucleotide metabolism. This course is designed for second year and above graduate students.

PHR 744. Protein Mass Spectrometry. 3 Hours.

PHR 752. Pharmacokinetic Analysis. 1 Hour.
The course will provide a detailed introduction to the analysis of pharmacokinetic data preferably generated as part of the student¿s research. Descriptions of the use of appropriate analytical programs and the interpretation of pharmacokinetic data will be the major focus of this course.

PHR 754. Model Sys for Drug Discovery. 2 Hours.
This course will focus on the use of different genetically tractable model systems and their roles in drug discovery and drug development. The course will discuss the properties, benefits and deficiencies of major model systems used in drug discovery including yeast, zebrafish, xenographs, and genetically modified mouse strains.

PHR 755. Translational Pharmacology and Drug Development. 2 Hours.
Translational pharmacology covers the principles and practice of drug development from the laboratory (bench) to the patient (bedside). This course provides an overview of the processes involved in drug development. It familiarizes the student with the drug discovery and development process including types of clinical trials, regulatory requirements and results interpretations.

PHR 790. Pharmacology Journal Club. 1 Hour.
Pharmacology Journal Club.

PHR 798. Doctoral Level Non-Dissertation Research. 1-12 Hour.

PHR 799. Doctoral Level Dissertation Research. 1-12 Hour.
Prerequisites: GAC Z

Biochemistry & Structural Biology

Theme Information

Biochemistry & Structural Biology (BSB) is one of eight interdisciplinary PhD themes within Graduate Biomedical Sciences (GBS). Students select a theme upon application but have access to faculty and courses from across GBS, allowing for flexibility in both research and academics.

BSB provides training opportunities in a multitude of contemporary areas of basic and translational research. Our goal is to prepare our students for independent research careers in academic research institutions and industry. Our students have access to a large pool of mentors from across UAB with expertise in varied research areas, specializing in:

- Understanding the chemistry of life (biochemistry),
- A mechanistic understanding of life at the molecular level (structural biology), and
- The study of self-renewal, differentiation, and regeneration of cells (stem cell biology).

Admissions

Prospective students should visit the GBS Admissions page for information on admissions requirements, application deadlines, and how to apply.

Financial Support

All students accepted into GBS programs receive a competitive annual stipend and fully paid tuition and fees. Single coverage health insurance is also provided at no cost to the student. Please reference the GBS Financial Support page for further information.

Curriculum

Requirements		Hours
Lab Rotations		**3**
GBS 795	Lab Rotation 1	
GBS 796	Lab Rotation 2	
GBS 797	Lab Rotation 3	
Core Courses		**7**
GBS 701	Core Concepts in Research: Critical Thinking & Error Analysis	
GBS 707	Basic Biochemistry and Metabolism	
GBS 708	Basic Genetics and Molecular Biology	
GBS 709	Basic Biological Organization	
Module Courses [1]		**8**
Theme Required Courses		**8**
GBSC 742	GBS Student Theme Meeting Course [2]	
GBS Required Courses		**49**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [3]		
Biostatistics [4]		
Journal Clubs [5]		
Three Advanced Courses [6]		
Research [7]		
Total Hours		**75**

1. Four modular courses selected from the following: GBS 710, GBS 712, GBS 714, GBS 720, GBS 723, GBS 724, GBS 740A, GBS 740B, GBS 741, GBS 744, GBS 750, GBS 751, GBS 752, GBS 753, GBS 760, GBS 762, GBS 763, GBS 764, GBS 769, GBS 770, GBS 774, GBS 781, GBS 782, GBS 784, GBSC 718, GBSC 727, GBSC 729, GBSC 744, GBSC 747
2. Required each fall and spring semester, 2nd year until graduation
3. Course selected from the following: GBS 716, GBS 725 , GBSC 726, GRD 709
4. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716
5. Required each fall and spring semester, 2nd year until graduation. Courses selected from the following: GBS 736, GBS 746J, GBS 747J, GBS 756, GBS 766, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
6. Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714 GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732 GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, BME 723, BME 770, BME 772, BME 780, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797 or other approved course.
7. Student must complete 24 hours total of dissertation research, GBS 799.

Theme Directors

The theme directors listing for Biochemistry and Structural Biology is located here.

Theme Faculty

The faculty listing for the Biochemistry and Structural Biology theme is located here.

For further information, please reference the GBS website.

Cancer Biology

Theme Information

Cancer Biology is one of eight interdisciplinary PhD themes within Graduate Biomedical Sciences (GBS). Students select a theme upon application but have access to faculty and courses from across GBS, allowing for flexibility in both research and academics.

The Cancer Biology Theme provides training opportunities in multiple and contemporary areas of cancer research. Outstanding basic and translational research faculty from various schools, departments, and centers participate in training the next generation of basic and translational cancer researchers.

Admissions

Prospective students should visit the GBS Admissions page for information on admissions requirements, application deadlines, and how to apply.

Financial Support

All students accepted into GBS programs receive a competitive annual stipend and fully paid tuition and fees. Single coverage health insurance is also provided at no cost to the student. Please reference the GBS Financial Support page for further information.

Curriculum

Requirements		Hours
Lab Rotations		**3**
GBS 795	Lab Rotation 1	
GBS 796	Lab Rotation 2	
GBS 797	Lab Rotation 3	
Core Courses		**7**
GBS 701	Core Concepts in Research: Critical Thinking & Error Analysis	
GBS 707	Basic Biochemistry and Metabolism	
GBS 708	Basic Genetics and Molecular Biology	
GBS 709	Basic Biological Organization	
Module Courses		**8**
GBS 710	Cell Signaling	
GBS 769	Carcinogenesis	
GBS 770	Pathobiology of Cancer	
GBS 774	Cancer Immunology	
Theme Required Courses		**8**
GBS 777	Cancer Biology Seminar [1]	
GBS Required Courses		**49**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [2]		
Biostatistics [3]		
Journal Clubs [4]		
Three Advanced Courses [5]		
Research [6]		
Total Hours		**75**

1. Required each fall and spring semester, 2nd year until graduation
2. Course selected from the following: GBS 716, GBS 725 , GBSC 726, GRD 709
3. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716
4. Required each fall and spring semester, 2nd year until graduation. Courses selected from the following: GBS 736, GBS 746J, GBS 747J, GBS 756, GBS 766, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
5. Three advanced courses select from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.
6. Student must complete 24 hours total of dissertation research, GBS 799.

Theme Directors

The theme directors listing for Cancer Biology is located here.

Theme Faculty

The faculty listing for the Cancer Biology theme is located here.

For further information, please reference the GBS website.

Cell, Molecular and Developmental Biology

Theme Information

Cell, Molecular, and Developmental Biology (CMDB) is one of eight interdisciplinary PhD themes within Graduate Biomedical Sciences (GBS). Students select a theme upon application but have access to faculty and courses from across GBS, allowing for flexibility in both research and academics.

CMDB is designed to provide maximum flexibility that prepares students to launch into a career in the dynamic field of biomedical science. Our graduates have exciting careers in scientific research in both academic and industrial settings, scientific-related writing, business, law, forensics, administration, and education. Explore the many possible opportunities offered by CMDB at UAB and apply today!

Admissions

Prospective students should visit the GBS Admissions page for information on admissions requirements, application deadlines, and how to apply.

Financial Support

All students accepted into GBS programs receive a competitive annual stipend and fully paid tuition and fees. Single coverage health insurance is also provided at no cost to the student. Please reference the GBS Financial Support page for further information.

Curriculum

Requirements		Hours
Lab Rotations		**3**
GBS 795	Lab Rotation 1	
GBS 796	Lab Rotation 2	
GBS 797	Lab Rotation 3	
Core Courses		**7**
GBS 701	Core Concepts in Research: Critical Thinking & Error Analysis	
GBS 707	Basic Biochemistry and Metabolism	
GBS 708	Basic Genetics and Molecular Biology	
GBS 709	Basic Biological Organization	
Module Courses [1]		**8**
Theme Required Courses		**9**
GBS 717	Methods and Scientific Logic	
GBS 792	CMDB Seminar [2]	
GBS Required Courses		**49**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [3]		
Biostatistics [4]		
Journal Clubs [5]		
Three Advanced Courses [6]		
Research [7]		
Total Hours		**76**

1. Four modular courses selected from the following: GBS 710, GBS 712, GBS 714, GBS 720, GBS 723, GBS 724, GBS 740A, GBS 740B, GBS 741, GBS 744, GBS 750, GBS 751, GBS 752, GBS 753, GBS 760, GBS 762, GBS 763, GBS 764, GBS 769, GBS 770, GBS 774, GBS 781, GBS 782, GBS 784, GBSC 718 GBSC 727, GBSC 729, GBSC 744, GBSC 747
2. Required fall and spring semester, 2nd year until graduation.
3. Course selected from the following: GBS 716, GBS 725, GBSC 726, GRD 709
4. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716
5. Required each fall and spring semester, 2nd year until graduation. Courses selected from the following: GBS 736, GBS 746J, GBS 747J, GBS 756, GBS 766, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
6. Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.
7. Student must complete 24 hours total of dissertation research, GBS 799

Theme Directors

The theme directors listing for Cell, Molecular, and Developmental Biology is located here.

Theme Faculty

The faculty listing for the Cell, Molecular, and Development Biology theme is located here.

For further information, please reference the GBS website.

Genetics, Genomics & Bioninformatics

Theme Information

Genetics, Genomics, & Bioinformatics (GGB) is one of eight interdisciplinary PhD themes within Graduate Biomedical Sciences (GBS). Students select a theme upon application but have access to faculty and courses from across GBS, allowing for flexibility in both research and academics.

The GGB theme provides flexible, didactic, and integrated training opportunities across the broad disciplines of genetics, genomics, and

bioinformatics. Our goal is to prepare students for independent research careers in experimental and computational disciplines, or the combination of those in academic research institutions and industry. To support this broad subject, the academic departments at UAB offer a large pool of mentors with expertise in varied research areas. The research interests of our mentors and students span the fields of genetics, genomics, bioinformatics, cancer biology, biochemistry, cell biology, developmental biology, immunology, and neuroscience. In addition, we teamed up with the UAB Informatics Institute and HudsonAlpha Institute for Biotechnology to accommodate training in their specific areas.

Admissions

Prospective students should visit the GBS Admissions page for information on admissions requirements, application deadlines, and how to apply.

Financial Support

All students accepted into GBS programs receive a competitive annual stipend and fully paid tuition and fees. Single coverage health insurance is also provided at no cost to the student. Please reference the GBS Financial Support page for further information.

Curriculum

Requirements		Hours
Lab Rotations		**3**
GBS 795	Lab Rotation 1	
GBS 796	Lab Rotation 2	
GBS 797	Lab Rotation 3	
Core Courses		**7**
GBS 701	Core Concepts in Research: Critical Thinking & Error Analysis	
GBS 707	Basic Biochemistry and Metabolism	
GBS 708	Basic Genetics and Molecular Biology	
GBS 709	Basic Biological Organization	
Module Courses [1]		**8**
Theme Required Courses		**9**
GBSC 742	GBS Student Theme Meeting Course [2]	
GBS Required Courses		**49**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [3]		
Biostatistics [4]		
Journal Clubs [5]		
Three Advanced Courses [6]		
Research [7]		
Total Hours		**76**

1 Four modular courses selected from the following: GBS 710, GBS 712, GBS 714, GBS 720, GBS 722, GBS 723, GBS 724, GBS 740A, GBS 740B, GBS 741, GBS 744, GBS 750, GBS 751, GBS 752, GBS 753, GBS 760, GBS 762, GBS 763, GBS 764, GBS 769, GBS 770, GBS 774, GBS 781, GBS 782, GBS 784, GBSC 718, GBSC 727, GBSC 729, GBSC 744, GBSC 747

2 Required each fall and spring semester, 2nd year until graduation.

3 Course selected from the following: GBS 716, GBS 725, GBSC 726, GRD 709

4 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716

5 Required each fall and spring semester, 2nd year until graduation. Courses selected from the following: GBS 736, GBS 746J, GBS 747J,GBS 756, GBS 766, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793

6 Courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725,GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780 or approved course.

7 Student must complete 24 hours total of dissertation research, GBS 799.

Theme Directors

The theme directors listing for Genetics, Genomics, and Bioinformatics is located here.

Theme Faculty

The faculty listing for the Genetics, Genomics, and Bioinformatics theme is located here.

For further information, please reference the GBS website.

Immunology

Theme Information

Immunology is one of eight interdisciplinary PhD themes within Graduate Biomedical Sciences (GBS). Students select a theme upon application but have access to faculty and courses from across GBS, allowing for flexibility in both research and academics.

From the outset, UAB has been recognized as a leading academic research institution in the country and one of the world's premier centers for immunology research. Over 90 UAB faculty are actively engaged in immunological research, including:

- Studies to understand the basic function of the immune system and the underlying pathophysiological processes that contribute to a range of immune-mediated diseases,
- Translational studies that are focused on the development of vaccines and immunotherapeutics, and
- Clinical studies that test novel therapies designed to mitigate immune-mediated diseases.

Immunology plays such an important role in the ongoing research endeavor at UAB that Inflammation, Infection, and Immunity (I3) was

recently named as one of the five pillars of emphasis in the strategic plan for the UAB School of Medicine.

Admissions

Prospective students should visit the GBS Admissions page for information on admissions requirements, application deadlines, and how to apply.

Financial Support

All students accepted into GBS programs receive a competitive annual stipend and fully paid tuition and fees. Single coverage health insurance is also provided at no cost to the student. Please reference the GBS Financial Support page for further information.

Curriculum

Requirements		Hours
Lab Rotations		**3**
GBS 795	Lab Rotation 1	
GBS 796	Lab Rotation 2	
GBS 797	Lab Rotation 3	
Core Courses		**7**
GBS 701	Core Concepts in Research: Critical Thinking & Error Analysis	
GBS 707	Basic Biochemistry and Metabolism	
GBS 708	Basic Genetics and Molecular Biology	
GBS 709	Basic Biological Organization	
Module Courses		**8**
GBS 740A	Introduction to Immunology Part 1	
GBS 740B	Introduction to Immunology Part 2	
GBS 741	Lymphocyte Biology	
GBS 744	Mucosal Immunology	
Theme Required Courses		**8**
GBSC 742	GBS Student Theme Meeting Course [1]	
GBS Required Courses		**49**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [2]		
Biostatistics [3]		
Journal Clubs [4]		
Three Advanced Courses [5]		
Research [6]		
Total Hours		**75**

1 Required fall and spring semester, 2nd year until graduation.

2 Course selected from the following: GBS 716, GBS 725, GBSC 726, GRD 709

3 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716

4 Required each fall and spring, 2nd year until graduation. Courses selected from the following: GBS 736, GBS 746J, GBS 747J, GBS 756, GBS 766, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793

5 Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783,GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or approved course.

6 Student must complete 24 hours total of dissertation research, GBS 799.

Theme Directors

The theme directors listing for Immunology is located here.

Theme Faculty

The faculty listing for the Immunology theme is located here.

For further information, please reference the GBS website.

Microbiology

Theme Information

Microbiology is one of eight interdisciplinary PhD themes within Graduate Biomedical Sciences (GBS). Students select a theme upon application but have access to faculty and courses from across GBS, allowing for flexibility in both research and academics.

The Microbiology Theme emphasizes the study of bacteria, viruses, fungi, and parasites. Over 60 faculty members from the Departments of Microbiology, Cell Biology, Biochemistry and Molecular Genetics, Genetics, Pathology, Medicine, Pediatrics, and Dentistry are involved in internationally renowned research and the training of PhD students. UAB has rapidly become a major center for biomedical research and ranks among the most prestigious research institutions in the world.

Admissions

Prospective students should visit the GBS Admissions page for information on admissions requirements, application deadlines, and how to apply.

Financial Support

All students accepted into GBS programs receive a competitive annual stipend and fully paid tuition and fees. Single coverage health insurance is also provided at no cost to the student. Please reference the GBS Financial Support page for further information.

Curriculum

Requirements		Hours
Lab Rotations		**3**
GBS 795	Lab Rotation 1	
GBS 796	Lab Rotation 2	
GBS 797	Lab Rotation 3	
Core Courses		**7**
GBS 701	Core Concepts in Research: Critical Thinking & Error Analysis	
GBS 707	Basic Biochemistry and Metabolism	
GBS 708	Basic Genetics and Molecular Biology	
GBS 709	Basic Biological Organization	
Module Courses		**8**
GBS 760	Bacterial Genetics and Physiology	
GBS 762	Virology	
GBS 764	Introduction to Structural Biology Methods	
GBS 763	Microbial Pathogenesis	
Theme Required Courses		**10**
GBS 768	Communicating Science: Reading, Writing and Presentation	
GBSC 742	GBS Student Theme Meeting Course [1]	
GBS Required Courses		**49**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [2]		
Biostatistics [3]		
Three Advanced Courses [4]		
Journal Clubs [5]		
Research [6]		
Total Hours		**77**

1 Required fall and spring semester, 2nd year until graduation.

2 Course selected from the following: GBS 716, GBS 725, GBS 768, GBSC 726, GRD 709

3 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716

4 Required each fall and spring, 2nd year until graduation. Courses selected from the following: GBS 736, GBS 746J, GBS 747J, GBS 756, GBS 766, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793

5 Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 797, INFO 796, BME 723, BME 770, BME 773, BME 780, or other approved course.

6 Student must complete 24 hours total of dissertation research, GBS 799.

Theme Directors

The theme directors listing for Microbiology is located here.

Theme Faculty

The faculty listing for the Microbiology theme is located here.

For further information, please reference the GBS website.

Neuroscience

Theme Information

Neuroscience is one of eight interdisciplinary PhD themes within Graduate Biomedical Sciences (GBS). Students select a theme upon application but have access to faculty and courses from across GBS, allowing for flexibility in both research and academics.

The Neuroscience Theme provides training opportunities in multiple and contemporary areas of neuroscience research — from fundamental discovery science at the molecular, cellular, systems, and behavioral levels, to translational studies in cellular and animal models of diseases of the nervous system. Outstanding research faculty from various schools, departments, and centers participate in training the next generation of neuroscientists. The Neuroscience Theme seeks to equip and train students to become tomorrow's innovative neuroscientists by:

- Teaching fundamental neuroscience concepts that are the stepping-stones needed for a deeper understanding of nervous system function.
- Providing unique professional and scientific avenues through which they can develop their presentation skills and learn critical thinking and experimental design.
- Offering the opportunity to choose neuroscience research from multiple options available through laboratories across the UAB campus — not limiting students to a department but, rather, a discipline.
- Providing opportunities for informal interactions with other students to discuss research, scientific writing, and life outside and beyond graduate school.

Admissions

Prospective students should visit the GBS Admissions page for information on admissions requirements, application deadlines, and how to apply.

Financial Support

All students accepted into GBS programs receive a competitive annual stipend and fully paid tuition and fees. Single coverage health insurance is also provided at no cost to the student. Please reference the GBS Financial Support page for further information.

Curriculum

Requirements		Hours
Lab Rotations		**3**
GBS 795	Lab Rotation 1	
GBS 796	Lab Rotation 2	
GBS 797	Lab Rotation 3	
Core Courses		**7**
GBS 701	Core Concepts in Research: Critical Thinking & Error Analysis	
GBS 707	Basic Biochemistry and Metabolism	
GBS 708	Basic Genetics and Molecular Biology	
GBS 709	Basic Biological Organization	
Module Courses		**8**
GBSC 744	Neuroanatomy	
GBSC 729	Cell Neurophysiology	
GBS 714	Developmental Neuroscience	
GBSC 727	Neuro Systems	
Theme Required Courses		**18**
GBS 730	Introduction to Neurobiology (Dauphin Island Course) [1]	
GBS 737	Neuro Student Summer Seminar Series [2]	
NBL 703	Nuerobiology Seminar Series [3]	
GBS Required Courses		**49**
GRD 717	Principles of Scientific Integrity	
	Grant-Writing/Scientific Communication [4]	
	Biostatistics [5]	
	Journal Clubs [6]	
	Three Advanced Courses [7]	
	Research [8]	
Total Hours		**85**

1. Dauphin Island course- required summer before the 1st year
2. Required each summer semester
3. Required fall and spring semester, 2nd year until graduation.
4. Course selected from the following: GBS 716, GBS 725, GBSC 726, GRD 709
5. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716
6. Required each fall and spring semester, 2nd year until graduation. Courses selected from the following: GBS 736, GBS 746J, GBS 747J, GBS 756, GBS 766, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
7. Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.
8. Student must complete 24 hours total of dissertation research, GBS 799.

Theme Directors

The theme directors listing for Neuroscience is located here.

Theme Faculty

The faculty listing for the Neuroscience theme is located here.

For further information, please reference the GBS website.

Pathobiology, Pharmacology & Physiology

Theme Information

Pathobiology, Pharmacology, & Physiology (P^3) is one of eight interdisciplinary PhD themes within Graduate Biomedical Sciences (GBS). Students select a theme upon application but have access to faculty and courses from across GBS, allowing for flexibility in both research and academics.

P^3 provides our graduate students the broadest training within the emerging and exciting field of molecular medicine. We have a flexible, didactic, integrated educational program directed by faculty with diverse research interests ranging from molecules to whole organisms and disease processes to new therapies.

Admissions

Prospective students should visit the GBS Admissions page for information on admissions requirements, application deadlines, and how to apply.

Financial Support

All students accepted into GBS programs receive a competitive annual stipend and fully paid tuition and fees. Single coverage health insurance is also provided at no cost to the student. Please reference the GBS Financial Support page for further information.

Curriculum

Requirements		Hours
Lab Rotations		**3**
GBS 795	Lab Rotation 1	
GBS 796	Lab Rotation 2	
GBS 797	Lab Rotation 3	
Core Courses		**7**
GBS 701	Core Concepts in Research: Critical Thinking & Error Analysis	
GBS 707	Basic Biochemistry and Metabolism	
GBS 708	Basic Genetics and Molecular Biology	
GBS 709	Basic Biological Organization	
Module Courses		**8**
GBS 750	Intro to Physiology	

GBS 751	Intro to Physiology II	
GBS 752	Intro to Pathobiology	
GBS 753	Intro to Pharmacology & Toxicology	
Theme Required Courses		**8**
GBSC 742	GBS Student Theme Meeting Course [1]	
GBS Required Courses		**49**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific-Writing [2]		
Biostatistics [3]		
Journal Clubs [4]		
Three Advanced Courses [5]		
Research [6]		
Total Hours		**75**

1 Required each fall and spring semester, 2nd year until graduation.
2 Course selected from the following: GBS 716, GBS 725, GBSC 726, GRD 709
3 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716
4 Required each fall and spring semester, 2nd year until graduation. Courses selected from the following: GBS 736, GBS 746J, GBS 747J, GBS 756, GBS 766, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
5 Courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.
6 Student must complete 24 hours total of dissertation research, GBS 799.

Theme Directors

The theme directors listing for Pathobiology, Pharmacology, & Physiology is located here.

Theme Faculty

The faculty listing for the Pathobiology, Pharmacology, & Physiology theme is located here.

For further information, please reference the GBS website.

Multidisciplinary Biomedical Science

The MS Program in Multidisciplinary Biomedical Science (MBS) is intended for both domestic and international students who have some undergraduate STEM background and who wish to expand their foundation of knowledge in the biomedical sciences. MBS offers a 45 hour, research-intensive thesis option (Plan I), and a 30 hour non-thesis option (Plan II).

Why MBS?

If you are on the pre-health track (e.g., pre-med; pre-dental; pre-PA; pre-pharmacy), you are interested in careers in research science, science education, or you are considering alternative careers (e.g., scientific policy, science communication, biomedical sales), MBS may be the right Program for you.

Admission Requirements:

Direct-admittance to MBS requires a 3.0 minimum overall GPA and successful completion of the following pre-requisites: Introductory Biology (BY 123-124 if from UAB or equivalent) and Organic Chemistry (CH 235-238 if from UAB or equivalent). Your pre-requisite GPA and your Biology-Chemistry-Physics-Math (or BCPM) GPAs will also be considered in our administrative review of your application. The GRE is not required. For international applicants, the minimum TOEFL and IELTS scores required for direct entry are 80 and 6.5, respectively.

Students are required to submit their transcripts, a personal statement, and three letters of recommendation. Once these materials are received and the application fee is processed, applications will be reviewed.

Accelerated Learning Opportunities

MBS via the Accelerated Bachelors/Masters (ABM) Program

Multidisciplinary Biomedical Sciences offers an Accelerated Bachelors/Masters (ABM) (p. 10) option for high-achieving undergraduates. Distinct advantages of MBS-ABM include the use of up to 12 hours of shared credit that is applied to both your BS and MS degrees, taking graduate courses at the undergraduate tuition rate, and additional opportunities for academic advising and mentoring. The vast majority of MBS-ABM students are able to graduate with both their BS and MS degrees in 4 years, thus potentially making you more competitive for the next phase of your career trajectory. To be eligible for ABM, students must have met the following requirements prior to matriculating:

- Junior status (60 credit hours, 36 of these hours at UAB)
- Minimum 3.5 undergraduate GPA
- Completed the following pre-requisite courses: BY 123, BY 124, CH 235, CH 236, CH 237 and CH 238

MBS via Early Acceptance

The UAB Early Acceptance (EA) Program is designed for academically superior high-school students, allowing them to be admitted to MBS at the same time they are admitted to an undergraduate program. EA students may also utilize the ABM Program as a mechanism for admission to MBS.

Deadlines for all Applicants:

- **Fall:** August 1
- **Spring:** December 1
- **Summer:** April 15

For More Information:

Please contact Ms. Jessamine Huffman (Program manager; msmbs@uab.edu) or Dr. John Shacka (Program Director; shacka@uab.edu), or visit our website: https://www.uab.edu/graduate/programs/msmbs

M.S. in Multidisciplinary Biomedical Science

The MS in Multidisciplinary Biomedical Science (MBS) is intended as a terminal degree for students desiring many different career paths, including but not limited to: research (laboratory jobs in academia or industry), further graduate study (e.g. PhD), professional school (e.g., medical or dental), science education, scientific policy, science communication, or biomedical sales.

Thesis (Plan I)

The Plan I MS in MBS thesis degree at UAB can be completed over the course of five-six semesters if full-time, including at least one summer semester. Plan I students will complete a rigorous mentored research project in addition to a curriculum of required core and elective classes related to the biomedical sciences.

Successful completion of the Plan I MS in MBS degree requires passing 45 credit hours (30 hours = coursework; 15 hours = supervised research) and maintaining a minimum 3.0 GPA. Students must obtain a minimum C final grade in all required (non-elective) classes in order to graduate. However, only one C final grade is allowed among our three required core science courses- MBS 601, MBS 602, and MBS 603.

Coursework

Plan I students must complete the following required classes:

1) core science (MBS 601 (4 hours), MBS 602 (4 hours), MBS 603 (4 hours), 12 hours total)

2) biostatistics (BST 603, 3 hours) or equivalent with permission

3) three semesters of colloquium (MBS 697 (1 hour), 3 hours total)

4) three-four semesters of non-thesis research (MBS 698, 9 hours total)

5) one-two semesters of thesis research (MBS 699, 6 hours total)

6) electives (12 hours total).

Students have the option of earning a concentration by completing at least nine of their elective credit hours in a single subject area.

Research

Plan I students must complete five separate semesters of research totaling a minimum of 15 credit hours, including a minimum of 9 hours of MBS 698 (non-thesis research) over three-four semesters, and 6 hours of MBS 699 (thesis research) over one-two semesters (at least one semester is required). When registered for MBS 698 or MBS 699, students are expected to work on average a minimum of 15-20 hours/week on their research projects. During their first semester in the program, before they start their research projects, students undergo a mentor match process to choose their faculty thesis adviser, with the expectation that this decision is made before the start of their second semester. Plan I students will form a committee of three faculty that is chaired by their thesis adviser and are required to hold a minimum of three committee meetings (1: introductory; 2: qualifying exam; 3: thesis defense; additional meetings may be needed depending on student progress). The thesis project must be approved by the student's committee. For the qualifying exam, Plan I students are expected to prepare a seven page "NIH-style" grant proposal, plus a separate reference section, that is adjusted to the scope of their research project, and vet their proposals in front of their committee. Following qualification for thesis candidacy, Plan I students are required to complete a thesis document of their research findings and defend it publicly as a presentation to their committee and others (e.g., students, lab members, family members), which is followed immediately by a private defense with their committee. Plan I students work on their research projects for five semesters, typically semesters 2-6 while in the Program. During their first semester in the program, Plan I students should register for zero hours of MBS 698, to accommodate the mentor match process. Before students begin their research they must complete all lab-specific safety training. Students must also complete Responsible Conduct of Research (RCR) training for MS students before the end of their first semester registered for MBS 698.

Requirements		Hours
Required MBS Coursework		**18**
MBS 601	Molecular and Cell Biology	
MBS 603	General Human Physiology	
MBS 602	Biochemistry and Cell Biology	
MBS 697	Colloquium for MBS Plan I Thesis Students (Must be repeated twice for a total of 3 Credit Hours)	
BST 603	Introductory Biostatistics for Graduate Biomedical Sciences [1]	
Research [2]		**15**
MBS 698	Non-Thesis Research	
MBS 699	Thesis Research	
Electives [3, 4]		**12**
Total Hours		**45**

1 In place of BST 603, students may take one of the following statistics courses, with permission of the Course Director and MBS Program Director: BST 601, BST 611.

2 Students may enroll in MBS 698 (totaling 9 hours) for 3-4 semesters, and MBS 699 (totaling 6 hours) for 1-2 semesters (but a minimum of 1 semester). Total credit hours for MBS 698 and MBS 699 must equal a minimum of 15 hours. Students may take one extra semester of MBS 698 or MBS 699 in lieu of one 3 hour elective course, for a total of 18 research hours.

3 Students may select from the following electives: BY 501, BY 511, BY 512, BY 515, BY 527, BY 530, BY 531, BY 614, BY 616, BY 617, BY 620, BY 626, BY 629, BY 632, BY 633, BY 634, BY 636, BY 637, BY 640, BY 644, BY 662, BY 674, BY 675, BY 695, BY 697, CNBY 600, CNBY 610, CNBY 620, CNBY 630, CNBY 640, CNBY 660, CNBY 670, EPI 600, GGSC 610, GGSC 615, GRD 617, GGSC 620, GGSC 635, GGSC 665, GGSC 670, GGSC 690, GGSC 691, GRD 701,GRD 703, GRD 705, GRD 706, GR

GRD 709, GRD 713, GRD 716, GRD 717, GRD 719, GRD 722, GRD 727, GRD 735, GRD 739, GRD 745, GRD 751, GRD 759, GRD 760, GRD 761, GRD 773, GRD 774, INFO 601, INFO 602, INFO 603, INFO 604, INFO 610, LEAD 500, LEAD 501,LEAD 502, LEAD 503, LEAD 505, LEAD 506, LEAD 520, LEAD 521, LEAD 522, LEAD 523, LEAD 524, LEAD 525, LEAD 540, LEAD 542, LEAD 543, LEAD 544, LEAD 560, LEAD 570, LEAD 590, MBS 696, MIC 600, MIC 603, MIC 660, MIC 661, MIC 665, NBL 624, NBL 625, NBL 633, NBL 634, NBL 644, NBL 655, NBL 656, NBL 657, NBL 684, PHR 611, PHR 612, PHR 613, PHR 614, PHR 615, PHR 696, PSDO 630, PY 620, PY 653, PY 683, PY 687, PY 693.
For other elective options please discuss first with the MBS Program Director before registering.

[4] Students may use 9 elective hours in one of the following themes to pursue a specialized concentration:
Bioinformatics: INFO 601, INFO 602, INFO 603, INFO 604, INFO 610
Cancer Biology: CNBY 600, CNBY 610, CNBY 620, CNBY 630, CNBY 640, CNBY 660, CNBY 670, PHR 615
Genetic and Genomic Sciences (GGSC): GGSC 610, GGSC 615, GGSC 620, GGSC 635, GGSC 665 ,GGSC 670, GGSC 690, GGSC 691, BY 531, BY 634, BY 637
Immunology: MIC 600, MIC 603, MIC 660, MIC 661, MIC 665
Neuroscience: NBL 624, NBL 625, NBL 633, NBL 634, NBL 644, NBL 655, NBL 656, NBL 657, NBL 684, PY 620, PY 653, PY 683, PY 687, PY 693
Pharmacology: PHR 611, PHR 612, PHR 613, PHR 614, PHR 615, GGSC 670, PHR 696

Non-Thesis (Plan II) for Traditional MS Students

The Plan II MSBMS non-thesis degree at UAB can be completed over the course of three semesters if full-time, including one summer semester. Plan II students will complete a rigorous curriculum of required core and elective classes related to the biomedical sciences.

Successful completion of the Plan II MSBMS degree requires passing 30 credit hours of coursework and maintaining a minimum 3.0 GPA. Students must obtain a minimum C final grade in all required (non-elective) classes in order to graduate. However, only one C final grade is allowed among our three required core science courses- MBS 601, MBS 602, and MBS 603.

Coursework

Plan II students must complete the following required classes:

1) Core Science (MBS 601 (4 hours), MBS 602 (4 hours), MBS 603(4 hours), 12 hours total)

2) Biostatistics (BST 603, 3 hours) or equivalent with permission

3) Non-Thesis Colloquium (MBS 695, 1 hour)

4) Biotechnology skills lab (BT 650, 2 hour, OR BT 651, 2 hour)

5) Electives (12 hours total). Students have the option of earning a concentration by completing at least nine of their elective credit hours in a single subject area.

Requirements		Hours
MBS 601	Molecular and Cell Biology	4
MBS 602	Biochemistry and Cell Biology	4
MBS 603	General Human Physiology	4
MBS 695	Professional Development Colloquium for Non-Thesis Students	1
BT 650	Applications in Biotechnology I [1]	2
BST 603	Introductory Biostatistics for Graduate Biomedical Sciences [2]	3
Electives [3, 4, 5]		**12**
Total Hours		**30**

[1] Students may substitute BT 651 (spring semester) for BT 650 (fall semester).

[2] In place of BST 603, students may take one of the following statistics courses, with permission of the Course Director and MBS Program Director: BST 601, BST 611.

[3] Students may select from the following electives: BY 501, BY 511, BY 512, BY 515, BY 616, BY 617, BY 527, BY 530, BY 531, BY 614, BY 620, BY 626, BY 629, BY 632, BY 633, BY 634, BY 636, BY 637, BY 640, BY 644, BY 662, BY 674, BY 675, BY 695, BY 697, CNBY 600, CNBY 610, CNBY 620, CNBY 630, CNBY 640, CNBY 660, CNBY 670, EPI 600, GGSC 610, GGSC 615, GGSC 620, GGSC 635, GGSC 665, GGSC 670, GGSC 690, GGSC 691, GRD 617, GRD 701, GRD 703, GRD 705, GRD 706, GRD 707, GRD 708, GRD 709, GRD 713, GRD 716, GRD 717, GRD 719, GRD 722, GRD 727, GRD 735, GRD 739, GRD 745, GRD 751, GRD 759, GRD 760, GRD 761, GRD 773, GRD 774, INFO 601, INFO 602, INFO 603, INFO 604, INFO 610, MBS 696, MBS 698, MIC 600, MIC 603, MIC 660, MIC 661, MIC 665, NBL 624, NBL 625, NBL 633, NBL 634, NBL 644, NBL 655, NBL 656,NBL 657, NBL 684, PHR 611, PHR 612, PHR 613, PHR 614, PHR 615, PHR 696, PSDO 630, PY 620, PY 653, PY 683, PY 687, PY 693.
For other elective options please discuss with the MBS Program Director.

[4] Students may use 9 elective hours in one of the following themes to pursue a specialized concentration:
Bioinformatics: INFO 601, INFO 602, INFO 603, INFO 604, INFO 610
Cancer Biology: CNBY 600, CNBY 610, CNBY 620, CNBY 630, CNBY 640, CNBY 660, CNBY 670
Genetic and Genomic Sciences (GGSC): GGSC 610, GGSC 615, GGSC 620, GGSC 635, GGSC 665 ,GGSC 670, GGSC 690, GGSC 691, BY 531, BY 634, BY 637
Immunology: MIC 600, MIC 603, MIC 660, MIC 661, MIC 665
Neuroscience: NBL 624, NBL 625, NBL 633, NBL 634, NBL 644, NBL 655, NBL 656,NBL 657, NBL 684, PY 620, PY 653, PY 683, PY 687, PY 693
Pharmacology: PHR 611, PHR 612, PHR 613, PHR 614, PHR 615, GGSC 670

[5] As the majority of ABM students entering our program already perform undergraduate research, and also have required colloquium courses with similar content for their majors, we do not require them to take BT 650/ BT 651 or MBS 695. These three hours may be used for elective coursework to complete requirements for their MS degree."

Non-Thesis (Plan II) for Accelerated Bachelor's/Master's (ABM) Program Students

Undergraduates at UAB who meet qualifications for admission the Accelerated Bachelor's/Master's (ABM) program, and/or who also received an early acceptance (EA) option for a MS program at UAB, may choose to complete the Plan II MS non-thesis degree in MBS. Plan II students will complete a rigorous curriculum of required core and elective classes related to the biomedical sciences. Up to 12 of these elective credit hours may be used as shared credit towards both their B.S. and M.S. degrees. Successful completion of the Plan II MSBMS degree requires passing 30 credit hours of coursework and maintaining a minimum 3.0 GPA.

Coursework

Plan II students must complete the following required classes: 1) core science (MBS 601 (4 hours), MBS 602 (4 hours), MBS 603 (4 hours), 12 hours total); 2) biostatistics (BST 603, 3 hours) or equivalent with permission; and 4) electives (15 hours total). Students have the option of earning a concentration by completing three elective courses (minimum 9 hours) in a single subject area. Students must obtain a minimum C final grade in all required (non-elective) classes in order to graduate. However, only one C final grade is allowed among our three required core science courses- MBS 601, MBS 602, and MBS 603.

Requirements		Hours
MBS 601	Molecular and Cell Biology	4
MBS 602	Biochemistry and Cell Biology	4
MBS 603	General Human Physiology	4
BST 603	Introductory Biostatistics for Graduate Biomedical Sciences [1]	3
Electives [2,3]		**15**
Total Hours		**30**

1 In place of BST 603, students may take one of the following statistics courses, with permission of the Course Director and MBS Program Director: BST 601, BST 611.

2 Students may select from the following electives: BY 501, BY 511, BY 512, BY 515, BY 527, BY 530, BY 531, BY 614, BY 616, BY 617, BY 620, BY 626, BY 629, BY 632, BY 633, BY 634, BY 636, BY 637, BY 640, BY 644, BY 662, BY 674, BY 675, BY 695, BY 697, CNBY 600, CNBY 610, CNBY 620, CNBY 630, CNBY 640, CNBY 660, CNBY 670, EPI 600, GGSC 610, GGSC 615, GGSC 620, GGSC 635, GGSC 665, GGSC 670, GGSC 690, GGSC 691, GRD 617, GRD 701, GRD 703, GRD 705, GRD 706, GRD 707, GRD 708,GRD 709, GRD 713, GRD 716, GRD 717, GRD 719, GRD 722, GRD 727, GRD 735, GRD 739, GRD 745, GRD 751, GRD 759, GRD 760, GRD 761, GRD 773, GRD 774, INFO 601, INFO 602, INFO 603, INFO 604, INFO 610, MBS 696, MBS 698, MIC 600, MIC 601, MIC 602, MIC 603, MIC 604, NBL 624, NBL 625, NBL 633, NBL 634, NBL 644, NBL 655, NBL 656, NBL 657, NBL 684, PHR 611, PHR 612, PHR 613, PHR 614, PHR 615, PHR 684, PSDO 630, PY 620, PY 653, PY 683, PY 687, PY 693. For other elective options please discuss with the MBS Program Director.

3 Students may use 9 elective hours in one of the following themes to pursue a specialized concentration:
Bioinformatics: INFO 601, INFO 602, INFO 603, INFO 604, INFO 610
Cancer Biology (CNBY): CNBY 600, CNBY 610, CNBY 620, CNBY 630, CNBY 640, CNBY 660, CNBY 670, PHR 615
Genetic and Genomic Sciences (GGSC): GGSC 610, GGSC 615, GGSC 620, GGSC 635, GGSC 665,GGSC 670
Immunology: MIC 600, MIC 601, MIC 602, MIC 603, MIC 604
Neuroscience: NBL 624, NBL 625, NBL 633, NBL 634, NBL 644, NBL 655, NBL 656, NBL 657, NBL 684, PY 620, PY 653, PY 683, PY 687, PY 693
Pharmacology: PHR 611, PHR 612, PHR 613, PHR 614, PHR 615, PHR 696, GGSC 670

Courses

MBS 601. Molecular and Cell Biology. 4 Hours.
This course will provide a broad but rigorous overview of molecular biology. Cell structure between prokaryotes and eukaryotes will be compared and contrasted. DNA structure/organization will be discussed with respect to replication and repair mechanisms. Mendelian, non-Mendelian and chromosomal bases of genetics will also be discussed. Transcription and translation will be discussed in detail, along with their respective regulatory mechanisms. Throughout this course there will be a focus on intracellular organelles that contribute to the generation and regulation of DNA, RNA and protein. Finally, when possible, relevance to human disease will be presented and discussed.

MBS 602. Biochemistry and Cell Biology. 4 Hours.
This course will cover the structure, function and metabolism of biological macromolecules including proteins, carbohydrates, lipids and nucleotides. A rigorous overview of pathways will be discussed that are important for the effective metabolism of macromolecules (e.g. glycolysis, citric acid cycle) and generation of energy for cells. The last part of this course will discuss membrane structure and function, and will provide an overview of eukaryotic cell signaling.

MBS 603. General Human Physiology. 4 Hours.
This course begins with the study of basic cell function, then proceeds to a rigorous overview of specific human organ systems.

MBS 695. Professional Development Colloquium for Non-Thesis Students. 1 Hour.
This course will provide a rigorous overview of scientific reading, writing, and presenting skills, with a focus on career development. Students will work in teams to read, present and critique journal club articles; prepare and review resumes, individualized development plans (IDPs) and personal statements, followed by submission of re-writes; and learn effective interview skills via mock interview format.

MBS 696. Special Topics. 1-3 Hour.
To be determined by the Program Director and prospective Course Directors.

MBS 697. Colloquium for MBS Plan I Thesis Students. 1 Hour.
This required colloquium course will be taught using a journal club format. Students will be taught to critically review scientific literature, while gaining effective written and oral scientific communication skills. Students working in small groups will be responsible for choosing a current biomedical research article and sharing their review of this article in a Power Point (PPT) presentation. Student audience members will be responsible for asking questions during the presentation and for submitting a review of each article in abstract form. The Course Director will provide initial instruction in the critical review, presentation and written summary of scientific literature. Topics to be covered include: critical review (background and rationale for study; identification of hypothesis; description of methods used; presentation of results and their interpretation; indicate significance of study and describe next step experiments), effective communication of research articles via Power Point presentations; and writing assignments based on articles discussed in class. When possible, scientific integrity in research will be a focus of in-class discussions.

MBS 698. Non-Thesis Research. 0-6 Hours.
Students may perform independent study in a research laboratory setting. This work may contribute toward concentration credits subject to Program Director approval.

MBS 699. Thesis Research. 3-6 Hours.
Supervised independent research.
Prerequisites: GAC M

Neuroengineering

Degrees Offered	PhD
Website	www.uab.edu/engineering/home/neuroengineering
Program Co-Directo, Engineering	Jamie Tyler, PhD
Program Co-Directo, Medicine	Mark Bolding, PhD
Program Associate Director	Mark Bolding, PhD
Program Administrator	Kristy Barlow, MPA
E-mail	neuroeng@uab.edu

Admissions Requirements

- BS, MS, or be currently enrolled in the DMD/PhD or MD/PhD program at UAB*
- Minimum GPA of 3.0 on a 4.0 scale on most recent degree
- GRE is not required
- Personal statement identifying research interest
- CV/Résumé
- 3 academic or professional recommendations
- International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details;
- Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School (detailed instructions are included during the online application process)

* PhD students normally have earned a bachelor's degree in an engineering discipline or a closely-related field. Students with undergraduate degrees in the computer science, neuroscience, physical sciences, life sciences, or mathematics will also be considered for admission; however, such students must demonstrate preparation for the NE graduate curriculum. Admission to the NE PhD program is competitive.

Students admitted to the doctoral program typically receive a competitive stipend that includes payment of tuition. In addition to completing coursework requirements (see below), doctoral students must form a Graduate Dissertation Committee consisting of at least five faculty members, including the primary research mentor. At least one committee member must have a primary appointment in the School of Engineering and one must have a primary appointment in the School of Medicine. A written dissertation proposal must be orally presented to the committee and approved, at which time the student is admitted to candidacy. Admission to Candidacy must take place at least two semesters before the student may graduate. A written dissertation embodying the results of the student's original research must then be publicly defended, approved by the committee, and submitted to the Graduate School.

Publication Requirement. Original peer-reviewed research articles in reputable journals are the standard for demonstrating scientific productivity. The research conducted by NE doctoral students is expected to result in such publications. Before their degree is awarded, students are required to have at least one "first-author" journal article that has been published (or accepted for publication) and a second that has been submitted to a journal. Typically, a student's doctoral research will result in at least three first-author articles. Many students will be co-authors on collaborative research articles and may also share authorship on review articles, book chapters, conference proceedings, and other forms of scientific communication. Although these works bolster the student's scientific credentials, they do not count toward the NE publication requirement. In some cases, first-authorship of an article is shared among multiple individuals. In these cases, the article may count toward the publication requirement of only one doctoral student.

Additional Academic Policies

Special Topics courses and independent/individual study courses are reviewed for degree applicability to the degree. No more than 6 combined hours of Special Topics and/or Independent Study courses will be applied to the Neuroengineering PhD without appeal to and approval from the Program Directors.

UAB offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

Ph.D. in Neuroengineering

Requirements		Hours
GRD 717	Principles of Scientific Integrity	3
IDNE 701	Topics in Neuroengineering I	3
IDNE 702	Topics in Neuroengineering II	3
IDNE 720	Applications in Data Science	1
IDNE 796	Neuroengineering Journal Club [1]	6
BST 621	Statistical Methods I	3
or GRD 770	Intro to Biostats	
BST 622	Statistical Methods II	3
BME 717	Engineering Analysis	3
or ME 761	Math Methods in EGR I	
NBL 655	Synapses, Neurons and Brains	3
NBL 656	From Systems to Cog Neuro	3

EGR/CS Elective [2]		6
NS/LS Elective [3]		3
Other Electives [4]		
IDNE 773	Lab Rotation [5]	0
IDNE 798	Non-Dissertation Research	2
IDNE 799	Dissertation Research	24
Total Hours		**66**

1. Students must register for a minimum of 6 semesters; may also select another 700-level 1 hour Journal Club with Program Director approval.
2. Choose one from the following: CS 757, CS 760, CS 767, CS 773, CS 775, CS 785, EE 621, EE 641, EE 734, EE 738, EE 756, EE 758, ME 665.
3. Choose one from the following: GBS 714, GBSC 744, GBSC 718, GBSC 721, NBL 700, NBL 707, NBL 735, NBL 740, NBL 743, PY 707, PY 693, VIS 743, VIS 756, VIS 757.
4. Choose three from the following: GBS 714, GBS 722, GBSC 744, GBSC 718, NBL 740, NBL 743, PY 707, VIS 743, VIS 756, VIS 757, CS 760, CS 767, CS 773, CS 775, CS 785, EE 621, EE 641, EE 734, EE 738, EE 756, EE 758, ME 665, BST 623, BST 660, BST 680, BST 723.
5. Students who were not admitted directly into a lab ma register for a maximum of 4 rotations.

School of Dentistry

Dean: Russell Taichman, DMD, DMSc

The School of Dentistry offers degree programs leading to a Master of Science in Dentistry and the DMD/PhD in Dentistry. Advanced clinical specialty training and research, leading to the degree of Master of Science in Dentistry, is offered to meet two areas of need: the preparation of qualified teachers and investigators in the various branches of academic dentistry and the preparation of fully trained dental specialists.

The UAB School of Dentistry DMD/PhD program prepares students for an exciting career in dental academics through an innovative integrated clinician scientist training program. Students in the program are allowed to apply credits earned in both dental and graduate school towards a specialized program earning both a DMD degree and a PhD degree in a biomedical science.

Dentistry

Degree Offered:	M.S.
Director, Dentistry:	Dr. Amjad Javed
Phone:	(205) 996-5124
E-mail:	javeda@uab.edu
Website:	www.dental.uab.edu

Program Information

Advanced clinical specialty training and research, leading to the degree of Master of Science in Dentistry, is offered to meet two areas of need: the preparation of qualified teachers and investigators in the various branches of academic dentistry and the preparation of fully trained dental specialists. The program is a combination of the conventional work for the M.S. degree plus the achievement of proficiency in some phase of clinical dentistry. The course of study requires a minimum of two academic years; most students will require three years to complete the work. The applicant must be a graduate of an accredited school of dentistry, or an undergraduate school and must have achieved, in both predental and dental requirements, a superior scholastic record.

At the time of enrollment in the Graduate School, the student is assigned an appropriate faculty advisor, who works with the student in outlining a course of study consistent with objectives. This curriculum must cover the three areas of a selected phase of clinical dentistry, a related basic health science, and research.

Major and Minor

The major field of study must be selected from the following: dental biomaterials, endodontics, general dentistry, hospital dentistry, maxillofacial prosthetics, oral surgery, orthodontics, pediatric dentistry, periodontics, prosthodontics, public health dentistry, or oral biology. The program requires a minimum of 30 graduate credits. Not less than 18 semester hours of credit in the program must be in the major subject, with the minimum acceptable grade being B. A minor must involve at least six semester hours of study in one or two basic health science departments related to the student's major and research interests.

By the time the student has been in residence one year and has finished some of both major and minor courses, the student and the advisor should recommend to the Graduate School dean at least two additional graduate faculty members, one from outside the student's specialty area, for appointment to the graduate study committee. The student should discuss with his/her committee plans for the remaining course of study, including a proposed thesis title and outline of experimental design. Depending upon the nature of the research plan, it may be desirable for a different advisor to be appointed, serving either as co-chair or as new chair of the graduate study committee. At this time, demonstration of a reading knowledge related to literature review, competence in research and experimental design, understanding of biostatistics, experience with computer and other techniques may be required, as appropriate to the student's investigation.

Admission to Candidacy

When the graduate study committee is satisfied that the student is prepared to undertake the research, the student is admitted to candidacy for the master's degree. This step should be taken at least two semesters before the anticipated date of completion of the program.

Research and Thesis

Sufficient research work to train the candidate in the principles and methods of scientific investigation is required. The research project should involve the student's own intensive work in some area of dentistry, preferably related to the basic health sciences. The thesis is based on the research study and must show the candidate's ability to delineate a problem, logically plan its solution, and present the results of the work in an orderly fashion. Familiarity with the literature of the field is expected.

Final Examination

The final oral examination is administered by the student's graduate study committee before the deadline is set by the Graduate School. The examination begins with oral presentation and defense of the thesis and may include any work fundamental thereto. At the close of the examination, the committee votes on the candidate, taking into account all of the work undertaken. Majority approval is required.

Additional Information

Deadline for Entry Term(s):	Consult Program Director for information
Deadline for All Application Materials to be in the Graduate School Office:	Variable
Number of Evaluation Forms Required:	Three
Entrance Tests	DDS (TOEFL and TWE also required for international applicants whose native language is not English.)

Contact Information

For detailed information, contact the graduate program director, Dr. Amjad Javed, University of Alabama School of Dentistry, School of Dentistry Building, SDB 714, 1919 Seventh Avenue South, Birmingham, AL 35294-0007.

Telephone 205-934-5407
Fax 205-934-0208
E-mail **javeda@uab.edu**
Web **www.dental.uab.edu**

Master of Science with Emphasis in Oral Biology

The School of Dentistry in collaboration with the joint basic science Departments at The University of Alabama offers graduate studies leading to a Master of Science degree with emphasis in Oral Biology. The objective of the program is to relate basic biological sciences to health and disease of the oral cavity. This program is designed for individuals holding a D.D.S., D.M.D., or B.S. in Science (e.g. biology, chemistry etc) with little or no experience in basic research. This program will provide insight into dental academics and teaching in basic or applied research.

Students are required to pursue studies in oral biology and in the basic biological sciences. These studies include course work, seminars, journal club, and a laboratory component. Course work includes formal lectures from within the School of Dentistry and courses offered by the basic sciences departments, School of Public Health and the School of Medicine. The seminars and journal club include the “Dean’s Seminar Series” and the Oral and Skeletal Biology Journal Club and other Research seminars within UAB. The Seminars cover a wide array of topics relevant to various research areas as well as other disciplines of dentistry or dental education. A significant portion of the program is devoted to the design and completion of a thesis research project in the form of one publishable paper in a reputable scientific journal which is a requirement of the program. Thesis research will be carried out under the supervision of a faculty member. Faculty involved in the Master of Science program with emphasis in Oral Biology are actively engaged in research that represents a variety of oral and basic biomedical disciplines within the UAB. The diversity of the research interests offers opportunities for students to pursue studies in a stimulating research environment.

The program requires a **minimum of 30 graduate credits**. Of these, at least 24 credits must be selected from graduate-level courses approved for the program and a minimum of 6 credits at the master's research level. Each student must orally defend a master's thesis based on their research. If the applicant holds a D.D.S. or D.M.D. degree, the Master in Science may be combined with a clinical dental specialty training only after acceptance into the clinical program.

Admission

Applicants must hold a B.S., D.D.S., or D.M.D., or an equivalent degree and should possess a cumulative grade-point average of at least 3.00 on a 4.00 scale. Standardized test such as GRE or DAT is required for all applicants. Students whose first language is not English must earn a score of 560 or better on the Test of English as a Foreign Language (TOEFL).

Applicants are asked to submit a statement describing past research experience and current research interests, and stating how completion of the Master in Science program fits into their career goals.

For International applicants; transcripts and all related material should be received no later than **February 28** to enroll in the fall semester of the same year.

For US applicants; transcripts and all related material should be received no later than **March 31** to enroll in the fall semester of the same year.

Financial assistance is not available. Students must show that they can support themselves.

Contact

For further information and application materials, contact:

Jannet Katz, DDS, PhD
Professor
Department of Pediatric Dentistry
University of Alabama School of Dentistry
BBRB 713
1720 2nd Avenue South
Birmingham, AL 35294-2170
Telephone: (205) 934-2878
FAX: (205) 934-1426
e-mail: meow@uab.edu

M.S. in Dentistry

Select 6 classes from the list below - 18 hours

Requirements		Hours
PG 525	Design and Analysis of Clinical Dental Research	3
PG 583	Graduate Cariology	3
OB 602	Pharmacology and Therapeutics for Dentistry	3
OB 604	Clinical Applied Dent Material	3
OB 620	Oral Microbiology and Immunology	3
OB 622	Biochemistry of Connective Tissue and Bone	3
CD 626	Graduate Implantology II	3
CD 639	Dental Management of Medically Compromised Patient	2
CD 640	Physical Diagnosis	3
CD 646	Multidisciplinary Seminars I	3
CD 667	Selected Topics in Anatomy of the Head and Neck	3
CD 689	Conscious Sedation	3
CD 697	Advanced Restorative Technique	3
CD 717	Multidisciplinary Seminars II	3
CD 721	Oral & Skeletal BiologyJour	2
CD 722	Advanced Craniofacial Growth	3
CD 727	Craniofacial Syndrome Series	3
CD 728	Advanced Oral Pathology	3

Non-Thesis Research - 6 hours

Requirements		Hours
CD 698	Master s Level Non-Thesis Research	1-6

Thesis Research - 6 hours

Requirements		Hours
OB 699	Thesis Research	1-6
or		
CD 699	Master s Level Thesis Research	1-6

Total Hours - 30

CD-Clinical Dentistry Courses

CD 519. Medical Emergencies Dent Perio. 3 Hours.

CD 601. Advanced Endodontic Seminar I. 3 Hours.
Special Topics in Endodontics.

CD 602. Special Topics in General Dentistry. 3-6 Hours.

CD 603. Special Topics in Oral and Maxillofacial Surgery. 1-12 Hour.

CD 604. Special Topics in Orthodontics. 3 Hours.

CD 605. Special Topics in Pediatric Dentistry. 1-6 Hour.

CD 606. Special Topics in Periodontics. 3-12 Hours.

CD 607. Removable Prosthodontic Seminar. 1-12 Hour.

CD 608. Special Topics in Radiology. 1-6 Hour.

CD 609. Fixed Prosthodontics Seminar. 1-12 Hour.

CD 610. Introduction to Medical Genetics. 3 Hours.

CD 611. Special Topics in Maxillofacial Prosthodontics. 1-6 Hour.

CD 612. Avanced Prosthodontics Clinic First Year Clinic. 1-12 Hour.

CD 613. Special Topics in Hospital Dentistry. 1-6 Hour.

CD 614. Periodonal Case Conferences. 3 Hours.

CD 615. Periodontal Literature Review Seminars. 3 Hours.

CD 616. Periodontal Board Topics. 1-3 Hour.

CD 617. Maxillofacial Pathology. 3 Hours.

CD 618. Maxillofacial Orthognathic Surgery. 3 Hours.

CD 619. Dentoalveolar Surgery. 3 Hours.

CD 620. Clinical Pediatric Dentistry I. 3-6 Hours.

CD 621. POSTGRADUATE MAXILLOFACIAL TRAUMA. 3 Hours.

CD 622. ORAL and MAXILLOFACIAL MICROBIOLOGY SEMINAR. 3 Hours.
ORAL and MAXILLOFACIAL MICROBIOLOGY SEMINAR.

CD 623. POSTGRAD OMS SURGERY ANATOMY SEMINAR. 3 Hours.

CD 624. OMS Pathology Seminar. 3 Hours.

CD 625. Design and Analysis in Clinical Dental Research. 3 Hours.

CD 626. Graduate Implantology II. 3 Hours.

CD 627. Biocompatibility Testing/Biodegradation Phenomena. 3 Hours.

CD 628. Enamel Properties Acid Etching and Adhesion. 4 Hours.

CD 629. Ceramic Cements Alloy-Ceramic Systems Color Meas. 3 Hours.

CD 630. Clinical Biomaterials Research Methods. 3 Hours.

CD 631. Polymeric Biomaterials. 3 Hours.

CD 632. Biomaterials Seminar. 1 Hour.

CD 633. Alloy Systems in Dentistry. 3 Hours.

CD 634. Craniofacial Genetics. 3 Hours.

CD 635. Pediatric Dentistry Journal Club. 2 Hours.

CD 636. Hospital Dentistry. 2 Hours.

CD 637. Growth and Development-Genetics. 3 Hours.

CD 638. Current Topics in Dentistry. 1 Hour.

CD 639. Dental Management of Medically Compromised Patient. 2 Hours.

CD 640. Physical Diagnosis. 3 Hours.

CD 641. Advanced Dental Materials III. 3 Hours.
The resident will develop an in-depth understanding of the clinical applications and effective manipulation of current dental materials. Dentin bonding agents, composite resin selection, placement and polymerization will be covered. An overview of biomaterials for dental implants, and ceramic materials for prostodontics will also be presented.

CD 642. Biomaterials Book Review. 3 Hours.
The purpose of the book review is to strengthen the basic understanding of properties and behavior of different dental materials.

CD 643. Adv Clinical Prosth III. 6 Hours.
Advanced Clinical Prosthodontics III will provide students with a breadth of clinical experience in fixed, removable, implant, surgical, maxillofacial and other complex prosthodontics.

CD 644. Evidence Based Dentistry. 3 Hours.
Evidence based dentistry will teach students how to use literature as basis of clinical decisions.

CD 645. PBL: Adv Prosthodontics Topics. 3 Hours.
Topics in Advanced Prosthodontics. Permission of instructor required.

CD 646. Multidisciplinary Seminars I. 3 Hours.
Multidisciplinary seminars will teach the students how to interact with other disciplines in an informal setting and learn from these other disciplines.

CD 647. Treatment Planning Conference. 3 Hours.
Treatment planning conference will teach students how to generate a succinct and reasonable treatment sequence.

CD 648. Prosthodontic Case Conference. 3 Hours.
Prosthodontic case conference will teach students how to present completed treatment, and how to critically and professionally evaluate treatment outcomes.

CD 649. Prosthodontics Lit Review. 3 Hours.
Prosthodontics literature review will teach students how to critically evaluate literature, and to be familiar with current concepts in prosthodontics.

CD 650. Advanced Topics in Hospital Dentistry. 1-6 Hour.

CD 651. Advanced Endodontics Seminar II. 3 Hours.
Advanced Topics in Endodontics.

CD 652. Advanced Topics in General Dentistry. 3-6 Hours.

CD 653. Advanced Topics in Oral Surgery. 3-6 Hours.

CD 654. Advanced Topics in Orthodontics. 3 Hours.

CD 655. Advanced Topics in Pediatric Dentistry. 1-6 Hour.

CD 656. Advanced Topics in Periodontics. 1-12 Hour.

CD 657. Advanced Clinical Prosthodontics Second Year Clin. 3-12 Hours.

CD 658. Advanced Topics in Radiology. 1-12 Hour.

CD 659. Advanced Topics Fixed Prosthodontics. 3-12 Hours.

CD 660. Advanced Topics in Maxillofacial Prosthetics. 1-6 Hour.

CD 661. Physical Properties of Biomaterials. 1-3 Hour.

CD 662. Laboratory Methods for Biomaterials Research. 2-4 Hours.

CD 663. Diagnosis and Screening Procedures in Dentistry. 3 Hours.

CD 664. Grand Rounds in Pediatric Dentistry. 2-3 Hours.

CD 665. Maxillofacial Seminar. 3 Hours.
Physiology and Concepts of Occlusion.

CD 666. Clinical Maxillofacial Prosthetics. 1-3 Hour.

CD 667. Selected Topics in Anatomy of the Head and Neck. 3 Hours.

CD 668. Postgraduate Oral Pathology. 3 Hours.

CD 669. Clinical Pediatric Dentistry II. 3 Hours.

CD 670. Board Case Reviews in Pediatric Dentistry. 3 Hours.

CD 671. Case Presentations in Pediatric Dentistry. 1 Hour.

CD 672. Advanced Topics in OMS. 5 Hours.

CD 673. Special Topics in OMS Trauma. 4 Hours.

CD 674. Advanced Topics in OMS - Orthognathic. 4 Hours.
Advanced Topics in OMS - Orthognastic.

CD 675. Special Topics in OMS - Patient Care. 4 Hours.

CD 676. Advanced Topics in Oral Pathology. 4 Hours.

CD 677. Advanced Prosthodontics Third Year Clinic. 3 Hours.

CD 678. Board Preparation in Pediatric Dentistry. 3 Hours.
Review course for pediatric dental residents.

CD 679. Fundamentals of Pediatric Dentistry. 1-6 Hour.

CD 680. Dental Clinical Pathology. 3 Hours.

CD 681. Clinical Pedodontics III. 3 Hours.

CD 682. Special Topics in Endodontics. 3 Hours.

CD 683. Advanced Dental Materials I. 3 Hours.
Advanced course in dental materials.

CD 684. Advanced Dental Materials II. 3 Hours.
Advanced course in dental materials II.

CD 685. Advanced Endodontic First Year Clinic. 3 Hours.

CD 686. Advanced Endodontic Second Year Clinic. 3 Hours.

CD 687. Advanced Clinical Dentistry. 3 Hours.
Advanced course in clinical dentistry.

CD 688. Special Pathology. 1 Hour.

CD 689. Conscious Sedation. 3 Hours.

CD 690. Physiology and Concepts of Occlusion. 3 Hours.

CD 691. Special Topics in Biomaterials Science. 1-6 Hour.

CD 692. Advanced Prosthodontic Seminar. 1-12 Hour.

CD 693. Special Topics in OMS. 5 Hours.

CD 694. Advanced General Dentistry Seminars (I-IV). 1 Hour.

CD 695. Literature Review in Pediatric Dentistry. 3 Hours.

CD 696. Dental Radiology. 3 Hours.

CD 697. Advanced Restorative Technique. 3 Hours.

CD 698. Master s Level Non-Thesis Research. 1-6 Hour.

CD 699. Master s Level Thesis Research. 1-6 Hour.
Prerequisites: GAC M

CD 700. Cranio Deformities. 3 Hours.
Embryology: Review of H&N development. Genetics: Review of H&N disorders. Cleft lip: Diagnosis and management. Common craniofacial disorders; Diagnosis and management of Apert's, Crouzons, and Treacher-Collins, Hemifacial microsomia and other craniofacial disorders.

CD 701. Post-Graduate Micro Surgery. 3 Hours.
To understand the history of microsurgery; materials and instruments; coagulations and anticoagulants; technique or minor repair and vascularized tissue transfer.

CD 702. Post-Graduate Esthetic Surgery. 3 Hours.
Understand basic concepts of facial cosmetic surgery and become competent in diagnosis and treatment planning. The resident should learn surgery techniques of facial cosmetic surgery.

CD 703. Post-Graduate TMJ Disorders. 3 Hours.
To Understand the anatomy and biomechanics of the TMJ; the pathological conditions that affect the TMJ; the imaging modalities that can be utilized to aid in diagnosing TMD; and the various medical treatment options in managing TMD.

CD 704. Post-Grad Surg Implantology. 3 Hours.
Enrich the resident experience by providing in-depth discussion on the various surgical modalities that can aid in proper implant placement.

CD 705. Orothognatic Surgery. 3 Hours.
Understand the principle of orthognatic surgery.

CD 706. Board Exam Topics. 3 Hours.
To allow students tiime for study and laboratory activities in preparation of mock board exam, or the ABP examination.

CD 707. Fundamentals I. 5 Hours.

CD 708. Fundamentals II. 5 Hours.

CD 709. Dentistry & Culture. 3 Hours.

CD 710. Ethics I. 3 Hours.

CD 711. Dental Gross Anatomy. 6 Hours.

CD 712. General Pathology. 3 Hours.

CD 713. Microbiology. 3 Hours.

CD 714. Pharmacology. 3 Hours.

CD 715. Systemic Pathology. 3 Hours.

CD 716. Oral Pathology. 3 Hours.

CD 717. Multidisciplinary Seminars II. 3 Hours.

CD 718. Implant Dentistry Case Conf.. 3 Hours.

CD 719. Implant Evidence Based Dent. 3 Hours.

CD 720. Surgical Placement of Implants. 3 Hours.

CD 721. Oral & Skeletal BiologyJour. 2 Hours.

CD 722. Advanced Craniofacial Growth. 3 Hours.

CD 723. Neuroanatomy. 6 Hours.

CD 724. Cardiovascular & Renal Systems. 6 Hours.

CD 725. Dental Microbiology. 1 Hour.

CD 726. Genetics. 2 Hours.

CD 727. Craniofacial Syndrome Series. 3 Hours.

CD 728. Advanced Oral Pathology. 3 Hours.

CD 729. TMD Interdisciplinary Problem. 3 Hours.

CD 730. 3-Dimensional Imaging Ortho. 3 Hours.

CD 731. Graduate Implantology I. 3 Hours.

CD 740. Advanced Restorative Tech II. 3 Hours.

CD 741. Esth & Restorative Dent Lect. 3 Hours.

CD 742. Contmp Esth & Restorative Prep. 3 Hours.

CD 746. Micro-Esthetics. 3 Hours.

CD 749. Macro Esthetics. 3 Hours.

CD 768. Micro Esthetics II. 3 Hours.

CD 772. Dentofacial Esthetics. 3 Hours.

CD 788. Craniofacial Syndrome SeriesII. 3 Hours.

OB-Oral Biology Courses

OB 500. Graduate Cariology. 3 Hours.

OB 510. Intro to Dental Materials Res. 3 Hours.

OB 513. Grant Writing. 3 Hours.

OB 522. Biochemistry of Connective Tissue and Bone. 3 Hours.

OB 525. Current Issues in Nutrition and Oral Health. 3 Hours.

OB 563. Saliva as a Diagnostic Fluid. 3 Hours.

OB 590. Oral Biology Seminar. 1-2 Hour.

OB 598. MR Lev Non-Thesis Res. 3-6 Hours.

OB 599. Thesis Research. 3-6 Hours.

OB 600. Graduate Cariology. 3 Hours.

OB 601. Caries Journal Club. 1 Hour.
Introduce students communication skills in areas of scientific reading, presentation and use of scientific material.

OB 602. Pharmacology and Therapeutics for Dentistry. 3 Hours.

OB 603. Oral Inflammation and Periodontal Disease. 3 Hours.
Provides a fundamental knowledge base for understanding the initiation and progression of oral inflammation and how these processes mediate tissue destruction and bone loss.

OB 604. Clinical Applied Dent Material. 3 Hours.

OB 607. Prenatal Craniofacial Growth and Development. 3 Hours.
PRENATAL CRANIOFACIAL GROWTH and DEVELOPMENT.

OB 608. Special Topics in Oral Biology. 1 Hour.

OB 611. Saliva:Composition and Function. 3 Hours.

OB 616. Postgraduate Oral Histology. 3 Hours.

OB 620. Oral Microbiology and Immunology. 3 Hours.

OB 622. Biochemistry of Connective Tissue and Bone. 3 Hours.
Biochemistry of Connective Tissue and Bone.

OB 625. Current Issues in Nutrition and Oral Health. 3 Hours.
Current Issues in Nutrition and Oral Health.

OB 626. Graduate Implantology. 3 Hours.

OB 627. Surgical Implants in Dentistry. 3 Hours.

OB 630. Introduction to Clinical Trials/Epidemiology. 3 Hours.

OB 631. Ethics in Biomedical Research. 1 Hour.

OB 632. Special Topics on Mucosal Immunology. 3 Hours.

OB 633. Research Design and Methodology. 3 Hours.

OB 634. Oral Biology Journal Club. 1 Hour.

OB 657. Prenatal Craniofacial Growth and Development. 3 Hours.
PRENATAL CRANIOFACIAL GROWTH and DEVELOPMENT.

OB 663. Saliva as A Diagnostic Fluid. 3 Hours.

OB 690. Oral Biology Seminar. 1 Hour.

OB 696. Research Skills Enhancement. 2 Hours.

OB 697. Journal Club - Frontiers in Biomedical Research. 1 Hour.

OB 698. MR Lev Non-Thesis Res. 1-6 Hour.

OB 699. Thesis Research. 1-6 Hour.
Prerequisites: GAC M

DMD/PhD Program

Degree Offered:	DMD/PhD
Director:	Dr. Carly McKenzie
Phone:	(205) 934-3387
E-mail:	dentaladmissions@uab.edu
Website:	https://www.uab.edu/dentistry/home/academics/dmd-phd

DMD/PhD Program

The UAB School of Dentistry DMD/PhD program prepares students for an exciting career in dental academics through an innovative integrated clinician scientist training program. Applicants interested in the DMD/PhD program must have completed an undergraduate degree program (BA or BS) that fulfills all requirements for both dental school and graduate school admissions.

Interested students need to contact Dr. Carly McKenzie, Director of Admissions, UAB-School of Dentistry at 205.934.3387 or by email at dentaladmissions@uab.edu.

Important Points:

1. DMD and PhD degrees will be awarded within the same year upon completion of all dental and graduate school requirements.
2. Duration of the program is 8 years; however students with strong prior research experience have completed the program in 7 years.
3. Students accepted into the DMD/PhD program that do not complete the PhD training program, are required to reapply to the School of Dentistry for admission as a traditional DMD candidate.

To apply to the program, applicants must:

1. Contact Dr. Steve Filler at UAB School of Dentistry indicating intent to apply for the DMD/PhD program.
2. Submit a formal application to the UAB School of Dentistry through AADSAS as early as possible.
3. Submit an online application to the UAB Graduate School through one of the Biomedical Sciences Interdiscipinary Themes, Engineering (Biomedical or Materials), Public Health, or other graduate program.
4. Have successfully taken the Dental Aptitude Test (DAT).
5. Have completed all the recommended courses for both dental and graduate school admissions.
6. Have prior hands-on-research experience.

Note: Students must submit separate applications to the UAB School of Dentistry and the UAB Graduate School. The Graduate School application can be found on the Graduate School's website (uab.edu/graduate) by clicking the 'Apply Now' button. The UAB School of Dentistry participates in the American Association of Dental Schools Application Service (AADSAS). Students should initiate AADSAS applications as early as possible.

Applicants under consideration will be requested to file a supplemental DMD/PhD application. Applicants qualified for admission will be invited for a personal interview with the Admissions Committee.

Candidates will be evaluated based on their academic record, DAT scores, research accomplishments, publications, commitment to a research dental academic career, character, and personality traits indicating potential for success in a DMD/PhD program.

Sequence of the DMD/PhD Program:

1. Students first enter the Graduate School and complete at least two years of coursework including graduate school qualification examinations and dissertation proposal defense maintaining at least a 3.0 GPA.
2. After research PhD candidacy with approval of the DMD/PhD Advisory Committee the student transitions into the DMD curriculum in lock step with a dental class from years 2-4.
3. DMD and PhD degrees are awarded within the same year upon completion of the degrees programs.

Financial Support Opportunities:

Students enrolled in the DMD/PhD training program are eligible for funding through the School of Dentistry's NIDCR supported T-90 Dental Academic Research Training (DART) Program or an individual NIDCR supported F-30 Training Award. See details about these programs at the following links: DART Program and the NIDCR F-30 grant application (**http://grants.nih.gov/grants/guide/pa-files/PAR-08-119.html**.)

School of Education & Human Sciences

General Information

UAB offers graduate programs that lead to teacher certification in a variety of preschool-12th grade teaching disciplines (such as Biology, English Language Arts, Early Childhood Education, English as a Second Language, Kinesiology/Physical Education, Early Childhood and Collaborative Special Education, etc.) and School Psychometry, School Psychology, and Instructional Leadership. Non-teacher-certification programs include Community Health, Clinical Mental Health Counseling, Marriage, Couples, & Family Counseling, and Kinesiology with a choice of concentration areas. UAB also offers graduate programs that are focused on Higher Education Administration (MS) and Instructional Design and Development (MS). A complete listing and description of all graduate programs are included in the Department of Curriculum and Instruction and Department of Human Studies sections of the catalog. Most teacher certification programs have both master's (MAEd) and a post-master's Education Specialist (EdS) degrees. Additionally, the School of Education and Human Sciences offers doctoral programs in Early Childhood Education (PhD), Instructional Leadership (EdD), Educational Studies in Diverse Populations (PhD), and Community Health Promotion (PhD).

All educator certification programs in the School of Education and Human Sciences are approved by the Alabama State Board of Education (ALSBE) and are accredited by the Council for the Accreditation of Educator Preparation (CAEP). The Counseling programs are accredited by the Council for Accreditation of Counseling & Related Educational Programs (CACREP). The Music program is accredited by the National Association of Schools of Music (NASM). The Art program is accredited by the National Association of Schools of Art and Design (NASAD).

Degrees and Certificates

Degrees are awarded by UAB in recognition of scholastic achievement and may be pursued for their own sake. However, employment in the public schools is governed not by the degree but by the professional certificate issued by the Alabama State Department of Education (ALSDE). Since many students in these programs are preparing for work in the public schools, the pursuit of a degree is usually coupled with pursuit of ALSDE certification. There is a rough correspondence between degree level and certification class, as follows:

Bachelor's = Class B Professional Educator Certification

Master's = Class A Professional Educator Certification

Education Specialist (post-master's) = Class AA Professional Educator Certification

Doctoral does not have an equivalent associated educator certification

We emphasize that the admission and completion requirements for the degree and for the certificate are often significantly different. Furthermore, not all School of Education and Human Sciences students are pursuing teacher certification. Students seeking certification should verify requirements with an advisor or program director. Alabama State regulations governing certification change often; therefore, it is incumbent upon the student to seek advisement each term. Students should not register for any coursework without having first met with an advisor.

Interdisciplinary Studies

Ph.D. in Educational Studies in Diverse Populations (ESDP)

The Ph.D. in Educational Studies in Diverse Populations (ESDP) is to prepare professionals who can conduct research and lead innovation that enhances educational and life outcomes for diverse populations. This would include those who represent cultural or linguistic minorities, those with exceptionalities (gifted and disabled), those from economically challenged (and especially high-poverty) backgrounds, those impacted by gender biases, and those with other relevant learning or behavioral differences. To accommodate the widest range of student research interest in diversity issues there are three concentrations: Context, Culture, and Policy; Pedagogical Studies for Diverse Populations; and Health Disparities within Diverse Populations. This doctoral program is especially suited to preparing graduates with the research acumen needed to move easily into higher educational/postsecondary settings, P-12 central administration at the local, state, and national level, and leadership roles within school based settings, or non-academic positions within nonprofit organizations, specifically those with a research component. The minimum admission requirements are those of the UAB Graduate School. However, admission is highly selective, and most successful applicants have qualifications much higher than the minimum. Application packets must be complete in the Graduate School office before the applicant can be considered for the program.

Contact Information

For detailed information please visit the program website (https://www.uab.edu/education/home/graduate/phd-educational-studies-diverse-populations), or contact Dr. Andrew McKnight (anmcknig@uab.edu) (Program Director), Dr. Tondra Loder-Jackson (tloderjackson@uab.edu) (Context, Culture, and Policy Concentration Advisor), Dr. Teaira McMurtry (spezzini@uab.edu) (Pedagogical Studies for Diverse Populations Concentration Advisor), or Dr. Larrell Wilkinson (ltalbott@uab.edu) (Health Disparities within Diverse Populations Concentration Advisor).

Doctor of Philosophy in Educational Studies in Diverse Populations

Requirements		Hours
Core Courses (Students must pass all four core courses to advance in the program.)		
EDC 750	Critical Pedagogy for Diverse Populations	3
EDF 755	Educational Studies in Diverse Populations: Theories of Inquiry	3
EDF 765	Context, Culture, and Policy (CCP) Proseminar	3
CHHS 742	Health Disparities in Diverse Populations	3
Research Courses		
EPR 609	Statistical Methods and Research in Education: Intermediate	3
EPR 696	Qualitative Research: Inquiry and Analysis	3
EPR 710	Computer Applications and Advanced Statistical Methods	3
EPR 792	Mixed Methods Approaches to Educational Research	3
GRD 717	Principles of Scientific Integrity	3
Concentration Courses [1]		**12-36**
Dissertation Courses [2]		**24**
Dissertation Seminar		

Dissertation Research: Minimum of 12 credit hours. Prerequisite: Admission to candidacy. Note: One semester with at least 12 credit hours is required.	
6 hours of directed dissertation research specific to intended topic	
Total Hours	**63-87**

[1] **Concentration Courses 12-36 Credits**
Once the prerequisite coursework has been satisfied, you will choose a concentration from one of the following three areas:

- Pedagogical Studies
- Context, Culture, and Policy
- Health Disparities

[2] Dissertation Courses 24 Credits

- Dissertation Seminar: 3 credit hours
- Dissertation Research: Minimum of 12 credit hours. Prerequisite: Admission to candidacy. Note: One semester with at least 12 credit hours is required.
- 6 credits of directed dissertation research or additional research courses specific to intended dissertation

Curriculum and Instruction

Chair:	Dr. Kathleen Clark
Phone:	(205) 996-8786
E-mail:	kclark5@uab.edu
Website:	http://www.uab.edu/education/ci/

Degree offered:	
Arts Education with a Concentration in Visual Arts	M.A.Ed.
Arts Education with a Concentration in Music	M.A.Ed.
Education, Early Childhood	Ph.D., Ed.S., M.A.Ed.
Education, Elementary	Ed.S., M.A.Ed.
Education, High School and Middle School (Secondary Education)	Ed.S., M.A.Ed.
Educational Studies Non-Certification	M.A.Ed.
English as a Second Language	Ed.S., M.A.Ed.
Instructional Design and Development	M.S.
Reading	M.A.Ed.
School Psychometry and Psychology	Ed.S., M.A.Ed.
Special Education	Ed.S, M.A.Ed.
Teaching English to Speakers of Other Languages	Ed.S.

Program Coordinator Contact Information

Program	Coordinator	Room	Phone Number
Early Childhood Education	Dr. Kelly Hill	EEC 209C	205-975-1220
Early Childhood Special Education	Dr. Jennifer Kilgo	EEC 208B	205-975-9613
Educational Studies in Diverse Populations - Pedagogical Studies Track	Dr. Teaira McMurtry	EEC 209E	205-934-5371
Elementary Education	Dr. Kelly Hill	EEC 209C	205-975-1220
English as a Second Language	Dr. Josie Prado	EEC 206A	205-975-5045
Instructional Design and Development	Dr. Jonan Donaldson	EEC 204C	205-934-8371
Music Education	Dr. Susan Spezzini	EEC 206B	205-934-8357
Reading Education	Dr. Jennifer Summerlin	EEC 211F	205-996-3540
School Psychology	Dr. Stephanie Corcoran	EEC 206C	205-934-6477
School Psychometry	Dr. Stephanie Corcoran	EEC 206C	205-934-6477
Secondary Education	Dr. Paulette Evans	HHB 210	205-975-7419
Special Education	Dr. Mary Rose Sallese	EEC 206D	205-934-9689
UABTeach	Dr. Paulette Evans	HHB 210	205-975-7419
Visual Arts Education	Dr. Susan Spezzini	EEC 206B	205-934-8357
World Languages Education	Dr. Susan Spezzini	EEC 206B	205-934-8357

Graduate Programs

The M.A.Ed. and Ed.S. programs emphasize improving the teaching skills of the student and broadening the student's understanding of the field(s) of teaching specialization. Numerous teaching fields are available. All prospective students must apply for admission through the Graduate School.

The M.A.Ed. program requires a minimum of 30-32 semester hours of study, and the Ed.S. program requires at least an additional 30 semester hours. For students' eligibility to graduate, all programs require a written final examination or comprehensive electronic portfolio and a minimum GPA of 3.25 for master’s degree and 3.50 for the Ed.S. An outline of the specific course requirements can be obtained from the following link: https://www.uab.edu/education/home/undergraduate-side-nav/program-checklist. Admission requirements are located at the following link: https://www.uab.edu/education/home/admissions.

The M.A.Ed. programs satisfy the academic requirements for the Alabama State Department of Education Class A Professional Certificate and an M.A.Ed. degree. The Ed.S. programs satisfy academic requirements for the Alabama State Department of Education Class AA Professional Certificate and an Ed.S. degree. See also the section "Education (General Information)" earlier in this catalog.

The M.S. in Instructional Design and Development program is a fully online program. All prospective students must apply for admission through the Graduate School.

The program leading to the Doctor of Philosophy (Ph.D.) degree in early childhood education is sufficiently flexible to accommodate the interests and previous preparation of the student, but it must include an internship and a substantial research component culminating in the completion of a dissertation. The minimum admission requirements are those of the UAB Graduate School. Admission is highly selective, and most successful applicants have qualifications much higher than the minimum. Admission is open with ongoing application considerations. Application packets must be complete in the Graduate School office before the applicant can be considered for the program.

CUIN - Curriculum and Instruction Courses

ECE-Early Childhood Educ Courses

ECE 545. Curriculum for Young Children: Math Science and SS. 3 Hours.
Basic knowledge of curriculum and concepts of mathematics, science, and social studies for young children. Child growth and development as basis for planning and teaching mathematics, science, and social studies to young children. Teaching methods and use of instructional media. Extensive field experience required. Admission to TEP required.

ECE 546. Comm Arts/Reading Young Child. 3-6 Hours.
Nature of reading and language arts experiences for children grades Pre-K-3. Media, materials, experiences, programs, and strategies to facilitate development of communicative abilities with emphasis on preserving and maintaining creative expression. Integration of learning in areas of listening, speaking, reading, composition, literature, handwriting, spelling, and other communication arts. Laboratory experiences required.

ECE 548. Infant/Toddler Development. 3 Hours.
Study of human development within an ecological context from before birth to three years of age. Course covers social-emotional, physical, cognitive, language, and creative development of the infant and toddler in the home and also in programs for very young children.

ECE 549. Edu Environment: Inf/Todd/Par. 3 Hours.
Study of infant (or toddler) development as it relates to the organization of a parent/infant (or toddler) educational program. Information concerning program management, observation of parent/infant (or toddler) interaction, development and sequencing of activities, creation and evaluation of materials, and an examination of techniques and procedures for parent involvement and education. Actual experience in working with a parent/infant (or toddler) program will be an integral part of the course.
Prerequisites: ECE 548 [Min Grade: C]

ECE 620. Introduction to Curriculum and Teaching in Cultural & Familial Contexts. 3 Hours.
Developing knowledge of early childhood curricula for young children and their families in a variety of cultural contexts. Relationship of child growth and development and family empowerment in planning and implementation of curriculum. Field experience required.

ECE 630. Cognitive Curriculum ECE. 3 Hours.
Mathematics and science for young children based on constructivism. Topics include children's thinking, particularly in physical-knowledge, group games, and situations in daily living. Development of moral autonomy is also included. Field experiences required.
Prerequisites: EPR 594 [Min Grade: C](Can be taken Concurrently)

ECE 631. Programs for Young Children. 3 Hours.
Basic knowledge of organizing and administering early childhood programs, infancy through third grade, in a variety settings. Provides an overview of functions of program administration including pedagogy, accreditation, organizational development and systems, human resources, collaboration, and advocacy. Field experiences required.

ECE 632. Young Children and Their Literature. 3 Hours.
Literature for children infancy through third grade; selection, use, and integration of literature in total curriculum. Using literature for reading and writing instruction. Field experiences required.

ECE 633. Social and Emotional Development of the Young Child. 3 Hours.
Topics include the study of social and emotional development, the child's ability to react to and interact with the social environment, temperament, attachment, emotional regulation, and social competence. Field experiences required.

ECE 670. Studying the Young Child in School. 3 Hours.
This course provides an overview of key issues related to analysis of child study in school and the values and limitations of assessment. Candidates will engage in in-depth experiences in evaluating the growth and development of children. Field experience required.

ECE 690. Infant-Toddler Practicum. 1 Hour.
Early Childhood Practicum in birth to age 3 settings.

ECE 691. Practicum Supervision in ECE. 1-3 Hour.
Supervision of practicum students.

ECE 692. Practicum in Primary Education. 1 Hour.
Early childhood practicum in Kindergarten to third grade settings.

ECE 693. Internship in Early Childhood Education. 6 Hours.
Supervised teaching in an early childhood (P–3) program. The student gradually assumes responsibility for planning and teaching for the entire class (minimum of 15 weeks). The internship experience includes supervision in working with resource professionals and parents. Approval of application for Internship in ECE required. All program courses must be completed. Admission to TEP required.

ECE 694. Practicum in Play-based Education for the Young Child. 3 Hours.
Investigate the intrinsic nature of play in the lives of young children; engage in play observations, analyze contemporary theories of play & development, and plan and implement a play-based curriculum inclusive of creativity, curiosity, play, social negotiation, and problem-solving.

ECE 730. Doctoral Seminar I: Issues in Development Theory. 3 Hours.
Special Topics in Early Childhood and Development Studies. Specific topic announced in class schedule. Admission to ECE Doctoral Program required.
Prerequisites: GAC Z

ECE 731. Doctoral Seminar II: Children and Society. 3 Hours.
Special Topics in Early Childhood and Development Studies. Specific topic announced in class schedule. Admission to ECE Doctoral Program required.

ECE 732. Doctoral Seminar III: History of Early Childhood Education. 3 Hours.
Survey of historical, philosophical, and sociocultural foundation of early childhood programs and policies. Admission to ECE Doctoral Program required.

ECE 734. Logic and Scientific Inquiry. 3 Hours.
Scientific investigation as applied in education. Conceptual issues in research process. Methods of analysis and presentation.

ECE 735. Meaning and Development of Play. 3 Hours.
Nature of play, its importance and how it is nurtured.

ECE 737. Parent Child and School Interface. 3 Hours.
Historical development of parent involvement. Theoretical bases of family-school interactions.

ECE 738. The Consultation Process and the Young Child. 3 Hours.
Skills for working with families, teachers, and professionals in community agencies that serve infants, toddlers, and young children.

ECE 740. Research Apprenticeship. 3-6 Hours.
Planning, implementation, analysis, and presentation of research.

ECE 746. Contemporary Issues in Science Education. 3 Hours.
Crisis atmosphere surrounding science education in American classroom.

ECE 748. Research in Infancy. 3 Hours.
Theoretical and empirical evidence relating to developmental domains for young children.

ECE 749. Advanced Early Childhood Curriculum. 3 Hours.
Historical, philosophical, psychological, and social thought influencing curriculum in early childhood education.

ECE 750. Literacy Before School. 3 Hours.
Written language development of preschool children.

ECE 751. School and Literacy Instruction. 3 Hours.
Primary-level literacy instruction and children's literacy development. Prerequisites: Admission to doctoral program in early childhood education and two courses in language development.

ECE 752. Theory Research Literacy Developement Instruction. 3 Hours.
Philosophical and psychological beliefs regarding literacy development.

ECE 760. Current Issues in Education. 2-3 Hours.
Current Issues in Early Childhood Education and Advocacy.

ECE 774. Advanced Seminar in Language Development. 3 Hours.
Relationship of thinking and knowing to language development; strategies for analysis; strengths and weaknesses of techniques of examining language development.

ECE 790. Internship in Early Childhood Education and Development. 3-9 Hours.
Internship.

ECE 791. Field Studies in Early Childhood Education. 1-6 Hour.
Individual Field Projects.

ECE 792. Directed Readings in Research. 3 Hours.
Review of research in early childhood education to gain understanding of conceptual and methodological basis.

ECE 793. Individual Research in Early Childhood Education. 3 Hours.
Recent research in early childhood education; systematic solutions to problems in education.

ECE 794. Current Research Topics in Early Childhood Education. 1-3 Hour.
Philosophical aspects of scientific methods in education; functions of paradigms, theories, and models in inquiry; theory development and validation; major types of experimental and nonexperimental inquiry appropriate to study of educational phenomena.

ECE 798. Non-Dissertation Research. 1-12 Hour.
The course provides for supervised research experience under the direction of a graduate faculty member within the School of Education. The topic for an ECE 798 course must relate to the discipline or specializations within early childhood education and child development.

ECE 799. Dissertation Research. 1-12 Hour.
Doctoral research. Admission to candidacy and IRB approval for dissertation research required.
Prerequisites: GAC Z

ECT-Collaborative Teacher Educ Courses

ECT 519. Methods of Reading Assessment, Instruction & Intervention. 3 Hours.
This 3-hour course will address knowledge and skills needed for selecting, administering, analyzing, interpreting, and discussing reading assessments. The foci of the course include utilizing the assessment data for the development of differentiated reading instruction, targeted intervention, and special education referral and review. Minimum grade of C required.
Prerequisites: ECY 600 [Min Grade: C] and ECT 520 [Min Grade: C]

ECT 520. Formative and Summative Assessment. 3 Hours.
In-depth analysis of testing, assessment, and accountability applied to special education. Analysis of applied issues such as standards-based reform, annual yearly progress, response to intervention, and program effectiveness. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities. [Course is for students in the Alternative Masters Program (AMP) only].
Prerequisites: ECY 600 [Min Grade: C]

ECT 521. IEP Programming and Lesson Planning. 3 Hours.
This course focuses on the diagnosis and evaluation of students with disabilities using a variety of developmentally appropriate curriculum-based assessments, criterion referenced, and norm-referenced tests. Emphasis is on the interpretation of information from assessments into Individualized Education Program annual goals and objectives, transition planning, and Response to Intervention planning. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 522. Language and Communication Facilitation. 3 Hours.
This course provides information on communication assessment and intervention procedures useful for teachers of students with disabilities. Includes an overview of normal and typical language development and research on effective naturalistic communication interventions. Candidates will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 523. Instructional Methods. 3 Hours.
This course provides information on research-based instructional strategies for equipping students with disabilities with the skills and knowledge that will help them thrive in the classroom and beyond the school day. Particular emphasis will be placed on general instructional strategies for the acquisition and generalization of skills. In addition, strategies for implementing individualized and effective programming will be addressed. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 524. Sensory, Health and Physical Methods. 3 Hours.
This course introduces research-based assessment and instructional strategies for equipping students with sensory, health, and physical disabilities with the skills and knowledge that will help them thrive in the classroom and beyond the school day. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 525. Positive Behavioral Supports. 3 Hours.
This course presents definition and measurement of behavior, reinforcement strategies, systematic program development, basic formats for classroom instruction, and techniques for monitoring student progress. There is an emphasis on procedures for increasing academic and socially appropriate behavior through simulations and practice exercises. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 526. Assistive and Instructional Technology. 3 Hours.
This course examines the use of computer-based instruction and management systems to facilitate classroom instruction. The course includes issues related to the integration of technology into instructional design, a review and analysis of educational software, an exploration of educational considerations of technology for individuals with disabilities, an evaluation of assistive technology options, and an overview of instructional and managerial computer applications. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 527. Collaborative Processes. 3 Hours.
This course provides a variety of collaborative options for supporting students with disabilities. These include collaborating with families, agencies, paraprofessionals as well as other professionals.
Prerequisites: ECY 600 [Min Grade: C]

ECT 528. Legal Issues and Trends. 3 Hours.
This course explores current laws and trends relating to special education.
Prerequisites: ECY 600 [Min Grade: C]

ECT 529. Teaching Literacy and Reading in Inclusive Settings. 3 Hours.
The purpose of this course is to provide teacher candidates with an understanding of a balanced approach to literacy and research -based best practices for supporting literacy development among a diverse population of students. This knowledge affords teachers the ability to choose curricular goals, design instruction, promote student achievement, and assess and /or report student to a variety of stakeholders.
Prerequisites: EDU 500 [Min Grade: C] and ECY 600 [Min Grade: C]

ECT 530. Effective Teaching and Learning. 3 Hours.
This course focuses on the effective teaching and learning of students with disabilities. Course work will focus on planning appropriate lessons that support the student, ways to engage all learners and analyze teaching effectiveness. Candidates will also learn ways of using feedback to guide further learning and ways of using assessment to inform instruction.
Prerequisites: EDU 500 [Min Grade: C] and ECY 600 [Min Grade: C]

ECT 531. Internship in Collaborative Teaching. 3-9 Hours.
These courses are required in UAB's Alternative Masters Program (AMP) for a Master of Arts in Education with Alternative Class A certification for teaching in the following areas: Collaborative Teacher K-6, Collaborative Teacher 6-12, Early Childhood Special Education, Visual Impairments P-12. The purpose of ECT 531 is to prepare teachers to use Best Practices for teaching within their content area. As stipulated by the ALSDE Administrative Code, determining readiness to serve as a certified teacher shall require competence to teach as demonstrated in an internship of 15 weeks of full-time student teaching. Collaborative Teacher K-6 and 6-12, and Visual Impairments P-12 interns will have two placements to satisfy their K-6 and 6-12 and P-12 certification requirements (i.e., 7.5 weeks in a K-5 placement and 7.5 weeks in a 6-12 placement).

ECT 532. Student Teaching Seminar. 1 Hour.
This course will accompany student teaching/internship to support and extend the efforts of student teaching. The course will focus on the successful completion of edTPA assignments and submission.

ECT 554. Communication & Technology Applications In Early Childhood Special Education. 3 Hours.
The purpose of this course is to provide information on communication facilitation and assistive and instructional technology applications for young children with delays or disabilities. The course examines (a) the use of various communication systems, (b) naturalistic communication strategies, (c) computer-based instruction and management systems to utilize assistive and instructional technology, (d) issues related to the integration of technology into instructional design, (e) a review and analysis of educational software, (f) an exploration of educational considerations of technology for young children with delays or disabilities, (g) an evaluation of assistive technology options, and (h) an overview of instructional and managerial computer applications. Candidates will incorporate evidence-based decision-making, IFSP and IEP development, and program planning to facilitate communication and provide instruction for young children with delays or disabilities and their families.

ECT 555. Early Primary Curriculum and Methods. 3 Hours.
Universal design, response to intervention, and co-teaching are central components of this course. This course provides information on providing evidence-based instructional strategies and support to young children (K-3) with delays or disabilities. The intent is to equip children (K-3) with the skills and knowledge that will help them thrive in the classroom, as well as other settings. Particular emphasis will be placed on applied teaching strategies for the acquisition and generalization of skills.

ECT 619. Methods of Reading Assessment, Instruction, and Intervention. 3 Hours.
This 3-hour course will address knowledge and skills needed for selecting, administering, analyzing, interpreting, and discussing reading assessments. The foci of the course include utilizing the assessment data for the development of differentiated reading instruction, targeted intervention, and special education referral and review. Minimum grade of C required.
Prerequisites: ECY 600 [Min Grade: C] and ECT 620 [Min Grade: C]

ECT 620. Formative and Summative Assessment. 3 Hours.
In-depth analysis of testing, assessment, and accountability applied to special education. Analysis of applied issues such as standards-based reform, annual yearly progress, response to intervention, and program effectiveness. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.

ECT 621. IEP Programming and Lesson Planning. 3 Hours.
This course focuses on the diagnosis and evaluation of students with disabilities using a variety of developmentally appropriate curriculum-based assessments, criterion referenced, and norm-referenced tests. Emphasis is on the interpretation of information from assessments into Individualized Education Program annual goals and objectives, transition planning, and Response to Intervention planning. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.

ECT 622. Language and Communication Facilitation. 3 Hours.
This course provides information on communication assessment and intervention procedures useful for teachers of students with disabilities. Includes an overview of normal and typical language development and research on effective naturalistic communication interventions. Candidates will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.

ECT 623. Instructional Methods. 3 Hours.
This course provides information on research-based instructional strategies for equipping students with disabilities with the skills and knowledge that will help them thrive in the classroom and beyond the school day. Particular emphasis will be placed on general instructional strategies for the acquisition and generalization of skills. In addition, strategies for implementing individualized and effective programming will be addressed. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 624. Sensory, Health and Physical Methods. 3 Hours.
This course introduces research-based assessment and instructional strategies for equipping students with sensory, health, and physical disabilities with the skills and knowledge that will help them thrive in the classroom and beyond the school day. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 625. Positive Behavioral Supports. 3 Hours.
This course presents definition and measurement of behavior, reinforcement strategies, systematic program development, basic formats for classroom instruction, and techniques for monitoring student progress. There is an emphasis on procedures for increasing academic and socially appropriate behavior through simulations and practice exercises. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.

ECT 626. Assistive and Instructional Technology. 3 Hours.
This course examines the use of computer-based instruction and management systems to facilitate classroom instruction. The course includes issues related to the integration of technology into instructional design, a review and analysis of educational software, an exploration of educational considerations of technology for individuals with disabilities, an evaluation of assistive technology options, and an overview of instructional and managerial computer applications. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 627. Collaborative Processes. 3 Hours.
This course provides a variety of collaborative options for supporting students with disabilities. These include collaborating with families, agencies, paraprofessionals as well as other professionals.
Prerequisites: ECY 600 [Min Grade: C]

ECT 628. Legal Issues and Trends. 3 Hours.
This course explores current laws and trends relating to special education.
Prerequisites: ECY 600 [Min Grade: C]

ECT 631. Practicum in Collaborative Teaching. 3-9 Hours.
The purpose of ECT 631 is to prepare teachers to use Best Practices for teaching within their content area. As stipulated by the ALSDE Administrative Code, determining readiness to serve as a certified teacher shall require competence to teach as demonstrated in a focused practicum experience. Field experience is required.

ECT 654. Communication and Technology Applications In Early Childhood Special Education. 3 Hours.
The purpose of this course is to provide information on communication facilitation and assistive and instructional technology applications for young children with delays or disabilities. The course examines (a) the use of various communication systems, (b) naturalistic communication strategies, (c) computer-based instruction and management systems to utilize assistive and instructional technology, (d) issues related to the integration of technology into instructional design, (e) a review and analysis of educational software, (f) an exploration of educational considerations of technology for young children with delays or disabilities, (g) an evaluation of assistive technology options, and (h) an overview of instructional and managerial computer applications. Candidates will incorporate evidence-based decision-making, IFSP and IEP development, and program planning to facilitate communication and provide instruction for young children with delays or disabilities and their families.

ECT 655. Early Primary Curriculum and Methods. 3 Hours.
Universal design, response to intervention, and co-teaching are central components of this course. This course provides information on providing evidence-based instructional strategies and support to young children (K-3) with delays or disabilities. The intent is to equip children (K-3) with the skills and knowledge that will help them thrive in the classroom, as well as other settings. Particular emphasis will be placed on applied teaching strategies for the acquisition and generalization of skills. In addition, strategies for implementing individualized and effective programming in all curricular areas will be addressed. Candidates will incorporate evidence-based decision-making, design instructional programs, provide instruction, and monitor the progress of children K-3 with delays or disabilities. The course also focuses on co-teaching and working as a member of the team along with paraprofessionals, related service personnel, general educators, and families.

ECT 679. Advanced Legal Aspects of Special Education. 3 Hours.
Provides students with an in-depth examination of legal information pursuant to individuals with disabilities. The Individuals with Disabilities Education Act and its related amendments, the Americans with Disabilities Act, and Section 504 of the Improvement Rehabilitation Act are major federal laws reviewed in this course. Special education litigation is also addressed during the course.
Prerequisites: ECT 650 [Min Grade: C]

ECT 700. ASD: An Introduction. 3 Hours.
The course provides candidates with an in-depth examination of the characteristics of individuals with autism spectrum disorders (ASD). Specific issues examined during the course include diagnostic and educational criteria as well as current research on etiology and medication. Additionally, the myriad challenges faced by individuals with ASD are examined. A broad overview of evidenced-based practices to support individuals with ASD is presented in the course. A developmental perspective of ASD across the life span is presented, and issues related to play and leisure, sexuality education, environmental supports, transition planning, and daily life skills are explored in the course. The nature and needs of individual with Asperger's Syndrome are also addressed in this course.

ECT 701. ASD: App of Assessment Inform. 3 Hours.
Candidates taking this course are required to critically review, administer, and interpret the results of common standardized assessments given to individuals with ASD. Additionally, candidates are required to develop informal assessments to monitor the academic and behavioral progress of individuals with ASD. The CAPS/Ziggarut model will be used by candidates to conduct a comprehensive, developmental assessment in order to develop and implement an educational program for a student with ASD.

ECT 702. ASD: Meth Mod to Sev Function. 3 Hours.
Methods course, with special emphasis on low-functioning learners an Individuals with autism spectrum disorders. Particular attention is given effective practices and strategies for teaching and promoting functional and adaptive behavior that will enhance the learner¿s social responsibility and independent performance of daily activities.

ECT 703. ASD: Meth High Funct Learn- Asp. 3 Hours.
Methods course, with special emphasis on learners with higher functioning autism spectrum disorders and Asperger Syndrome. Particular attention is given effective practices and strategies for teaching and promoting social skill development and proactive social interactions. Autism Spectrum Disorders: Methods for High Functioning Learners and Asperger's Syndrome. Field experience required.

ECT 704. ASD: Collaboration-Consultation. 3 Hours.
This is a collaboration/consultation course designed to increase the candidate's knowledge and skills in the areas of: (1) foundations of collaboration, consultation and teaming; (2) communication and problem-solving processes, (3) collaborative tools, technology and resources; (4) cultural and linguistic diversity issues related to collaboration; (5) collaboration in instructional and inclusive teams; (6) collaboration with families; and (7) consultation and collaboration with paraeducators, related service personnel, and other ancillary personnel. Leadership and advocacy as well as self-assessment/reflection of one's collaboration and consultation skills are addressed in the course.

ECT 705. ASD: Accommodating the Needs of Diverse Learners on the Spectrum. 3 Hours.
In this course, candidates will learn a variety of teaching strategies to support students with ASD from diverse backgrounds and those with diverse learning needs to access the general education curriculum. Response to Intervention and differentiated instruction are central components of the course. Candidates will learn a variety of strategies for providing accommodations for students with ASD who present with behavior, communication, attention, and cognitive challenges in general education classroom settings. Strategies for supporting students in general education classrooms in the areas of literacy and math are covered in the course. Candidates will also acquire strategies for facilitating second language acquisition for English Language Learners.

ECT 706. ASD: Advanced Social and Behavioral Methods. 3 Hours.
A major focus of this course is the utilization of applied analysis to support students with ASD who present behavioral challenges. Development of behavioral objectives, data collection procedures, single-subject design and functional behavior assessment are addressed in the course. Strategies for addressing antecedents to behavior and consequences of behavior are explored. Generalization and self-monitoring/self-regulatory strategies are addressed. Candidates will learn a variety of positive environmental supports and classroom management strategies. Strategies for facilitating the development of social skills, including the use of social stories and video modeling, are addressed in the course.

ECT 707. Autism Spectrum Disorders: Transition and Life Skills Programming. 3 Hours.
The transition needs of individuals with ASD from preschool, middle school, high school and post-secondary settings is examined in this course. Transition models, assessment and planning are core components of the course. Facilitating the development of self-advocacy and self-determination skills in individuals with ASD are addressed. Independent living skills and transition to community are included in the course. Transition education curricula and instructional strategies for facilitating successful employment and post-secondary education are addressed in the course. Interagency and interdisciplinary collaboration as well as job placement, training, and supervision, are components of this course.

ECT 708. Autism Spectrum Disorders: Legal, Ethical, and Professional Issues. 3 Hours.
This course has three major components. First, special education legislation and case law related to the IDEA, Section 504, the ADA, FERPA, and the Elementary and Secondary Act are explored. Second, this course requires candidates to examine ethical issues in special education and to develop a personal code of ethics in special education based upon the Alabama Code of Ethics for Educators and the Council for Exceptional Children Code of Ethics. Third, the professional leadership skills of candidates in this course are developed. Development of candidates' teacher leadership, mentorship, and advocacy skills is undertaken during in the course.

ECT 710. ASD: Practicum. 3 Hours.
To meet the requirements of this course, candidates will engage in a variety of integrated experiences in applied settings, including K-6, 6-12, and community settings. Please refer to the clinical and field experiences handbook for specifics regarding practicum requirements.

ECT 711. ASD: K-6 Internship. 3 Hours.
To meet the requirements of this course, candidates must complete an in-depth clinical experience in a K-6 setting that includes children and youth with ASD. Please refer to the clinical and field experiences handbook for specifics regarding internship requirements.

ECT 712. ASD: 6-12 Internship. 3 Hours.
To meet the requirements of this course, candidates must complete an in-depth clinical experience in a 6-12 setting that includes children and youth with ASD. Please refer to the clinical and field experiences handbook for specifics regarding internship requirements.

ECT 720. Universal Design for Lrn. 3 Hours.
This course covers the following areas: Accommodations/Modifications, Differentiated Instruction, Behavioral Strategies, Positive Learning Environments, Student Engagement, and Demonstration Teaching.

ECT 720L. Field Experience. 1 Hour.
This course covers the following areas: Accommodations/Modifications, Differentiated Instruction, Behavioral Strategies, Positive Learning Environments, Student Engagement, and Demonstration Teaching.

ECT 720R. Action Research. 1 Hour.
This course covers the following areas: Accommodations/Modifications, Differentiated Instruction, Behavioral Strategies, Positive Learning Environments, Student Engagement, and Demonstration Teaching.

ECY-Special Education Courses

ECY 535. Foundations of Early Childhood Special Education. 3 Hours.
This is the introductory graduate course in the early childhood special education program, which is designed to provide an overview of the field of early intervention/early childhood special education (EI/ECSE) and address policy issues, the importance of collaboration, and future directions. Candidates must develop competencies in the areas of historical and philosophical foundations of EI/ECSE, federal, state, and local laws and legal requirements, characteristics of young children with known or suspected disabilities, family-professional partnerships, service delivery options, recommended practices, current policy issues and trends, and professionalism and ethics. Another important aspect of this course is professional development and life-long learning. Candidates must demonstrate a number of research and technology skills such as: accessing resources to support graduate studies; conducting reviews of the early childhood special education resources and literature; using American Psychological Association (APA) professional style writing; utilizing technology to support graduate studies; and identifying professional development resources for life-long learning. Course content and assignments are designed to promote critical thinking, problem solving skills, evidence-based practice application, and resource identification.

ECY 536. Early Intervention and Preschool Curriculum and Methods. 3 Hours.
The purpose of this course is to provide candidates with the knowledge, skills, methods, and attitudes necessary to deliver effective intervention/education to young children (birth through five) with known or suspected disabilities and their families from a variety of social, ethnic, and racial backgrounds. The course will include discussions and readings on topics central to an adequate understanding of the conceptual and theoretical foundations underlying current curriculum and methods for young children. Special emphasis will be placed on supporting families in all aspects of intervention. Attention will be given to developmentally and individually appropriate practices that facilitate inclusive environments. Candidates will be familiarized with instructional strategies and technologies. Course content and assignments will promote the use of critical thinking skills, problem solving, and technologies as they are applied to instructional programs for young children with known or suspected disabilities and their families. The course objectives will be assessed through completion of the course requirements and class participation. The content of this course is based on evidence-based practices, which integrate the best available research evidence with professional and family wisdom and values. Emphasized throughout this course are the following objectives: how to be a member of a transdisciplinary team in providing instruction, how to respond to cultural diversity, how to provide services in high-poverty communities and LEAs, and how to utilize evidence-based practices in all aspects of services. These priority areas will be addressed throughout the course.
Prerequisites: EDU 500 [Min Grade: C] and ECY 600 [Min Grade: C] and ECY 535 [Min Grade: C] and ECY 537 [Min Grade: C]

ECY 537. Assessment in Early Childhood Special Education. 3 Hours.
The purpose of this course is to prepare the candidate with knowledge and practical applications regarding the screening and assessment of young children with known or suspected disabilities (ages birth through eight). Both child-level and family-level assessment procedures will be emphasized. The candidate completing this course will be prepared to make professional decisions regarding the screening, assessment, program planning, and progress monitoring of young children with disabilities. Course content and assignments will promote critical thinking and problem solving skills. The content of this course is based on evidence-based practices, which integrate the best available research evidence with professional and family wisdom and values. Emphasized throughout this course are the following objectives: how to be a member of a transdisciplinary team in providing services in the natural environment, how respond to cultural diversity, how to provide services in high-poverty communities and LEAs, and how to utilize evidence-based practices in all aspects of assessment. These priority areas will be addressed throughout the course.

ECY 538. Physical and Health Care Support in Early Childhood Special Education. 3 Hours.
The purpose of this course is to provide candidates with the knowledge, skills, methods, and attitudes necessary to deliver effective intervention/education to young children with physical and health impairments. The course will include discussions and readings on topics central to an adequate understanding of the conceptual and theoretical foundations underlying typical and atypical motor development and neurodevelopment. Candidates will become proficient in motor skill facilitation, positioning, handling, feeding and health care support. The course objectives will be assessed through completion of the course requirements and class participation.

ECY 539. Transdisciplinary Collaboration and Consultation in Early Childhood. 3 Hours.
This course is designed for students to develop the knowledge, skills, and ability to work collaboratively with other professionals who provide inclusive services to infants and young children with delays or disabilities and their families. Emphasis will be placed on working as members of teams, which include families, early childhood special education, and the related services of physical and occupational therapy. Topics include teamwork, group decision-making, team process, leadership, and communication, the evidence that supports these practices, and how such issues influence services for young children and their families. A significant portion of content/discussion will focus on the roles and functions of various disciplines (including family members) as team members. Case studies will be used in simulations of transdisciplinary teamwork in action.

ECY 600. Introduction to Exceptional Learner. 3 Hours.
An overview of exceptionality as it pertains to children and adults. Both high and low incidence populations will be examined. Each area of exceptionality will be reviewed in terms of etiology, diagnosis, prevalence, remediation, and educational strategies.

ECY 635. Foundations of Early Childhood Special Education. 3 Hours.
This is the introductory graduate course in the early childhood special education program, which is designed to provide an overview of the field of early intervention/early childhood special education (EI/ECSE) and address policy issues, the importance of collaboration, and future directions. Candidates must develop competencies in the areas of historical and philosophical foundations of EI/ECSE, federal, state, and local laws and legal requirements, characteristics of young children with known or suspected disabilities, family-professional partnerships, service delivery options, recommended practices, current policy issues and trends, and professionalism and ethics. Another important aspect of this course is professional development and life-long learning. Candidates must demonstrate a number of research and technology skills such as: accessing resources to support graduate studies; conducting reviews of the early childhood special education resources and literature; using American Psychological Association (APA) professional style writing; utilizing technology to support graduate studies; and identifying professional development resources for life-long learning. Course content and assignments are designed to promote critical thinking, problem solving skills, evidence-based practice application, and resource identification.

ECY 636. Early Intervention and Preschool Curriculum and Methods. 3 Hours.
The purpose of this course is to provide candidates with the knowledge, skills, methods, and attitudes necessary to deliver effective intervention/ education to young children (birth through five) with known or suspected disabilities and their families from a variety of social, ethnic, and racial backgrounds. The course will include discussions and readings on topics central to an adequate understanding of the conceptual and theoretical foundations underlying current curriculum and methods for young children. Special emphasis will be placed on supporting families in all aspects of intervention. Attention will be given to developmentally and individually appropriate practices that facilitate inclusive environments. Candidates will be familiarized with instructional strategies and technologies. Course content and assignments will promote the use of critical thinking skills, problem solving, and technologies as they are applied to instructional programs for young children with known or suspected disabilities and their families. The course objectives will be assessed through completion of the course requirements and class participation.

ECY 637. Assessment in Early Childhood Special Education. 3 Hours.
The purpose of this course is to prepare the candidate with knowledge and practical applications regarding the screening and assessment of young children with known or suspected disabilities (ages birth through eight). Both child-level and family-level assessment procedures will be emphasized. The candidate completing this course will be prepared to make professional decisions regarding the screening, assessment, program planning, and progress monitoring of young children with disabilities. Course content and assignments will promote critical thinking and problem solving skills. The content of this course is based on evidence-based practices, which integrate the best available research evidence with professional and family wisdom and values. Emphasized throughout this course are the following objectives: how to be a member of a transdisciplinary team in providing services in the natural environment, how respond to cultural diversity, how to provide services in high-poverty communities and LEAs, and how to utilize evidence-based practices in all aspects of assessment. These priority areas will be addressed throughout the course.

ECY 638. Physical and Health Care Support in Early Childhood Special Education. 3 Hours.
The purpose of this course is to provide candidates with the knowledge, skills, methods, and attitudes necessary to deliver effective intervention/ education to young children with physical and health impairments. The course will include discussions and readings on topics central to an adequate understanding of the conceptual and theoretical foundations underlying typical and atypical motor development and neurodevelopment. Candidates will become proficient in motor skill facilitation, positioning, handling, feeding and health care support. The course objectives will be assessed through completion of the course requirements and class participation.

ECY 639. Transdisciplinary Collaboration and Consultation in Early Childhood. 3 Hours.
This course is designed for students to develop the knowledge, skills, and ability to work collaboratively with other professionals who provide inclusive services to infants and young children with delays or disabilities and their families. Emphasis will be placed on working as members of teams, which include families, early childhood special education, and the related services of physical and occupational therapy. Topics include teamwork, group decision-making, team process, leadership, and communication, the evidence that supports these practices, and how such issues influence services for young children and their families. A significant portion of content/discussion will focus on the roles and functions of various disciplines (including family members) as team members. Case studies will be used in simulations of transdisciplinary teamwork in action.

ECY 670. Practicum in Early Childhood Special Education. 3-6 Hours.
Provides individualized field-based experiences to meet the unique needs of graduate candidates in ECSE. Students complete practicum experiences in settings that include children who present a wide range of disabilities within the 0-3, 3-5, 5-8 year age ranges. This practicum experience is tailored to the unique needs and experiences of each student.

ECY 672. Internship in Early Childhood Special Edu. 3-6 Hours.
Provides individualized field-based experiences that will meet the unique needs of ECSE candidates in the 5th year, nontraditional program. Students complete an internship in settings that include children who present a wide range of disabilities within the 0-3, 3-5, 5-8 year age ranges. This internship experience is tailored to the unique needs and experiences of each student.

ECY 689. Advanced Topics in Special Education/ School Psychometry. 1-6 Hour.
This course is designed to help candidates be scholars in the field of school psychology/psychometry. Candidates will learn the steps to explore, build on, and write about the literature on a topic in school psychology/psychometry. In this way, they will understand how to create new areas of scholarship to extend knowledge on a topic in their discipline.

EDA-Art Education Courses

EDA 534. Methods I: Visual Arts. 3 Hours.
Introduction to teaching visual arts in school settings. Developing basic skills in planning, instruction, and assessment. Admission to Alternative Master's Program required.

EDA 564. Methods II: Visual Arts. 3 Hours.
Preparation to plan, teach and assess the visual arts in school settings: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment.

EDA 584. Methods of Teaching Art Lab. 1 Hour.
Methods of Teaching Art Lab required.

EDA 680. Advanced Methods: Visual Arts. 3 Hours.
Advanced methods for teaching the visual arts in grades 6-14. Includes curriculum development, classroom interaction, pedagogical activities, technology applications, source materials, current research, society issues, and cognitive development of students. Current classroom teaching required.
Prerequisites: GAC M

EDA 690. Internship in Art Education N-12. 3-9 Hours.
For Alternative Master's Program students. Observation and student teaching in elementary and secondary schools (15 full weeks in school setting). Approval of internship application required.

EDC-Curriculum Education Courses

EDC 606. The Dynamics of Educational Change. 3 Hours.
Defining roles as change agents; understanding school as unit undergoing change; guiding perspectives in making changes. Prerequisite: Admission to graduate school.

EDC 651. Innovative Practices in Instruction. 3 Hours.
Current issues and special topics in instructional practice; topics vary. May be repeated with different subject areas.

EDC 655. Curriculum Principles and Practices. 3 Hours.
Current curriculum practices; concepts and principles underlying their development.

EDC 656. Developmental Prob and Issues in Curriculum Construc. 3 Hours.
Developmental Prob and Issues in Curriculum Construction includes field study of curriculum in teachers' own schools.

EDC 694. Curriculum Seminar. 1-3 Hour.
Prerequisite: EDC 655 or permission of instructor.
Prerequisites: EDC 655 [Min Grade: C]

EDC 695. Coaching for Effective Instruction. 3 Hours.
This course provides research based and standards based practices to effect instructional change in schools, working collaboratively with children, teachers, and administration.

EDC 707. Introduction to Teacher Leadership. 3 Hours.
This course is intended to be the first course in the Ed.S. program where students will begin their teacher leadership project.

EDC 711. Analysis and Evaluation of Teaching. 3 Hours.
Strategies and models for analysis of teaching. Use of data in evaluating teacher effectiveness. Prerequisite: Master's degree.

EDC 712. Seminar in Curriculum and Instruction. 3 Hours.
Critical issues and research. Development and discussion of individual research. Prerequisite: Master's degree.

EDC 713. Educational Issues and Human Diversity. 3 Hours.
Social, economic, and cultural forces contributing to deprivation; implications for teachers, administrators, and educational staff. Prerequisite: Master's degree.

EDC 720. Problems and Issues in Education. 3 Hours.
An ecological systems approach is used to assist students in focusing on the microsystem, mesosystem, exosystem, and macrosystem as each relates to current problems and issues in education related meeting the needs of diverse populations. Further emphases are placed on transformational teaching and learning, service learning, social justice, and citizenship.

EDC 725. Advanced Study in Social Studies Curriculum. 3 Hours.
Major problems and issues associated with social studies curriculum and instructional practices. Prerequisites: Completion of graduate course in teaching social studies and experience in teaching social studies.

EDC 728. EDS Research Project I. 3 Hours.
Development of research proposal. Proposal must be accepted and approved by appointed faculty committee.
Prerequisites: EPR 596 [Min Grade: C]

EDC 729. EDS Research Project II. 3 Hours.
Development and implementation of research proposal. Proposal must be accepted and approved by appointed faculty committee.
Prerequisites: EDC 728 [Min Grade: C] and EPR 594 [Min Grade: C]

EDC 731. Curricular Design & Implementation. 3 Hours.
Recognizing, assessing, and supporting quality instructional practices; program evaluation. School-based problem research project and field experience.

EDC 732. Culturally and Linguistically Responsive Instruction. 3 Hours.
Culturally responsive instruction, effective instruction of culturally and linguistically diverse (CLD) students, strategies to support academic and linguistic growth of English Learners, outreach to CLD parents and families, and professional learning communities.

EDC 740. Teaching All Learners. 3 Hours.
This course explores Universal Design for Learning to meet the educational needs of diverse populations.

EDC 750. Critical Pedagogy for Diverse Populations. 3 Hours.
In this course, students will embark on an intellectual exploration of the nuanced realms of equity and social justice in education, leveraging critical, postmodern, and feminist perspectives. They will analyze how racism, sexism, SES, and other forms of historical marginalization define and shape educational landscapes. Through this exploration, students will demonstrate understanding of critical theories by crafting strategies to foster inclusive learning environments, addressing personal biases in the process. Additionally, the course encourages engagement in transformative projects inspired by critical pedagogues and theorists, facilitating a journey marked by autonomy and scholarly rigor.

EDC 760. Engaging Glocal Communities. 3 Hours.
Engagement of local and global, (glocal)communities through the identification, development, and implementation of grant projects, especially for promoting a targeted area of specialization.

EDC 770. Professional Preparation of College Educators. 3 Hours.
The professional preparation of college educators for area of specialization in teaching K-12. Registration for this course requires admission to Pedagogical Studies Concentration or instructor permission.

EDC 780. Expanding Literature on Responsive Methodologies. 3 Hours.
The expansion of literature on responsive methodologies in a targeted area of specialization.

EDC 791. Field Studies. 1-6 Hour.
Participation in field studies related to a targeted area of specialization.

EDC 793. Directed Reading. 1-6 Hour.
Review of literature to expand understanding of conceptual and methodological basis in a targeted area of specialization.

EDC 795. Selected Topics. 1-6 Hour.
Recent studies in the education of diverse populations; systematic solutions to problems in a targeted area of specialization.

EDC 797. Dissertation Seminar. 1-9 Hour.
Doctoral Seminar.

EDC 799. Dissertation Research. 1-12 Hour.
Doctoral dissertation.
Prerequisites: GAC Z

EDR-Reading Education Courses

EDR 521. Reading in Content Areas. 1 Hour.
Application of principles of reading process to content-area materials and instruction. Designed for pre-service teachers. Field experience required concurrently with the field experience in a teaching methods course. Supervision fee $100.

EDR 540. Developmental Reading I. 1-4 Hour.
Materials and methods. Emphasis on planning balanced program and understanding reading process. Includes field experiences. Prerequisite: Admission to 5th-Year Program.

EDR 541. Literature for Adolescents. 3 Hours.
In this course, students will explore literary works crafted for and centered on adolescents, with a focus on narratives that represent the rich diversity of human experiences. This course invites students to engage with stories and perspectives from a wide range of backgrounds, including but not limited to those of Black, Indigenous, people of color, and individuals with varying abilities. Emphasis will be placed on exploring and understanding the unique cultural and personal contexts embedded in multicultural literature for adolescents. Additionally, students will be invited to critically explore, examine, and reflect upon their own identities, perspectives, and worldviews in the context of the narratives encountered throughout the course.

EDR 543. Developmental Reading II. 1-4 Hour.
Reading process as it relates to content area materials. Includes field experience. Prerequisite: Admission to 5th-Year Program.
Prerequisites: EEC 612 [Min Grade: C]

EDR 551. Reading in Content Areas. 3 Hours.
The aim of this course is to provide secondary preservice teachers with the knowledge, tools, and strategies to design and implement literacy instruction within and across content areas. This will cultivate students' existing literacies while strengthening their discipline-specific literacy. Through a combination of actively engaging in readings, discussions to construct and solidify learning, and creating multi-modal products of their learning, pre-service teachers will explore various literacy methods and strategies, synthesize new learning with prior knowledge, and develop the ability to assess their own progress. Additionally, students will collaborate with peers in content-specific discussions, culminating in the creation of a three-lesson plan learning segment that incorporates content-area and discipline-specific literacy instruction and engagement strategies.

EDR 600. Disciplinary Literacy P-12. 3 Hours.
The purpose of this course is to provide candidates with the foundational knowledge to design or implement an integrated, comprehensive, and balanced curriculum. Specifically, candidates will gain an understanding of a how reading and writing relate to the disciplines and to local, state, national, and professional standards. Candidates will develop an understanding of how to implement curriculum based on students' prior knowledge, world experiences, and interests. Additionally, candidates will explore specific instructional strategies for supporting students as agents of their own learning to develop the ability to be critical consumers of the discipline. This knowledge affords teachers the ability to ultimately evaluate curriculum to ensure that instructional goals and objectives meet the reading and writing demands of the content area and/or discipline.

EDR 640. Reading Improvement Workshop. 3-6 Hours.
For inservice teachers of reading. Specific content varies according to needs of teachers.

EDR 650. Teaching Reading P-12. 3 Hours.
Understanding of reading process. Nature of reading programs; readiness motivation, methods, skills, assessment, evaluation, materials, and resources.

EDR 652. Pre and Early Reading Instruction. 3 Hours.
Theoretical bases, procedures, techniques, and materials for prereading and reading instruction. Prerequisite: Developmental reading course.

EDR 653. Literature for Grades P-12. 3 Hours.
Emphasis on needs of children, selection of books, societal issues in children's literature.

EDR 654. Dyslexia Research, Education & Advocacy. 3 Hours.
The purpose of this course is to provide candidates with an understanding of a balanced approach to literacy and research-based best practices for supporting literacy development among a diverse population of students. Additionally, this course provides knowledge of the approaches available to specialize curriculum for meeting the exceptional needs of students.

EDR 655. Reading Assessment and Evaluation. 3 Hours.
Examines evaluation techniques such as observation, standardized oral and silent reading tests and informal reading inventories such as miscue analysis.

EDR 659. Research and Problems in Reading. 3 Hours.
For teachers in elementary and early childhood education.

EDR 690. Internship in Reading. 1-3 Hour.
Supervised experience with children with reading difficulties. Prerequisites: Admission to reading certification program, permission of instructor and department.

EDR 701. Advanced Diagnosis and Remediation of Reading. 3 Hours.
Examination of serious reading disabilities; diagnosis, possible remediation strategies, and development; diagnosis, possible remediation strategies, and development of remediation plan in lab setting. Prerequisites: Master's degree and M.A.-level diagnostic reading course or permission of instructor.

EDR 702. Reading: Theoretical Foundations. 3 Hours.
Relates concepts of learning, development, and linguistics to reading-learning process; emphasis on current theory; implications for program planning and classroom practice. Prerequisites: EDR 650 or permission of instructor, and master's degree.
Prerequisites: EDR 650 [Min Grade: C]

EDR 703. Advanced Research in Reading. 3 Hours.
Research Prerequisites: EDR 650 and master's degree.
Prerequisites: EDR 650 [Min Grade: C]

EDR 704. Field Experience in Reading. 3-6 Hours.
Supervised field experiences under direction of qualified reading consultant or supervisor in school setting. Prerequisites: Admission to Sixth-Year Program for Reading Teacher and permission of instructor.

EDR 705. Reading Instruction Seminar. 3 Hours.
Examination of trends and issues in field of reading. topics determined by each class. Prerequisites: Master's degree and 9 graduate hours in reading or permission of instructor.

EDR 706. Research. 1-3 Hour.
Research Prerequisites: Master's degree and permission of instructor.

EEC-Elem Early Childhood Courses

EEC 502. Primary Math Methods. 3 Hours.
Materials and methods on emergent numeracy. Extensive field experience required.
Prerequisites: TEP 0

EEC 505. Children's Literature in Elem. and Early Childhood. 3 Hours.
Materials and methods. Needs of children, selection of books, societal issues in children s literature, and role of media in children's literature. Field experiences required. Admission to TEP required.
Prerequisites: EDU 500 [Min Grade: C] and EEC 650 [Min Grade: C]

EEC 506. Language Arts in Elementary and Early Childhood Ed.. 1-4 Hour.
Materials and methods. Communication-based approach in developing effective language arts program. All aspects of language arts program addressed. Field experience required. Admission to TEP required.
Prerequisites: EEC 600 [Min Grade: C] and EEC 612 [Min Grade: C] and EEC 650 [Min Grade: C]

EEC 512. Math in EC and Elementary Educ. 3 Hours.
Material and methods of teaching mathematics. Emphasizes scope, sequence, and content of the mathematics program. Computation skills and problem solving are stressed. Extensive field experience required. Admission to TEP required.

EEC 513. Science in EC and Elem Edu. 3 Hours.
Scope, sequence, materials, and methods. Emphasis on teaching and the development of content and process skills. Extensive field experience required. Admission to TEP required.

EEC 514. Soc Studies in EC and Elem Edu. 3 Hours.
Scope, sequence, and content of elementary school social studies curriculum. Teaching strategies, program articulation, and instructional planning. Extensive field experience required. Admission to TEP required.

Prerequisites: EEC 612 [Min Grade: C]

EEC 515. Learning Environments through Positive Behavior Support. 3 Hours.
Theoretical approaches that focus on child centered curriculum, classroom management, discipline strategies and cultural, linguistic, and developmentally appropriate instruction. Extensive field experience required. Admission to TEP required.

EEC 521. Methods of Teaching Foundations of Reading Development. 3 Hours.
This 3-hour foundations of reading methods course will prepare educators with content knowledge of scientific and evidence-based foundations of the cognitive, linguistic, socio-cultural, and motivational influences for early language and literacy development. The course presents scientifically proven instructional methods, strategies, techniques, and materials, with focused considerations for brain processes of reading, that are needed to successfully teach reading to P-6 students. Specific topics will include the teaching oral language development (expressive and receptive), concepts about print, early orthography, and beginning reading skills (phonemic awareness, alphabet knowledge, high frequency words, phonics, decoding, and encoding/spelling). Extensive field experience required.

EEC 522. Methods of Teaching the Development of Reading Comprehension. 3 Hours.
This three-hour course will prepare educators to teach foundations of reading development using evidence-based instructional practices. Specific topics include promoting academic language development, including vocabulary development; promoting comprehension and analysis of literacy and informational texts; and developing the reading-writing connection. Extensive field experience required.

EEC 523. Methods of Reading Assessment, Instruction, & Intervention. 3 Hours.
This course will address the use of formal and informal assessment procedures used to design and evaluate robust reading instruction and intervention for children in preschool through high school. The focus of the course includes the knowledge and skills needed to choose and administer appropriate reading assessments for a variety of purposes, data-based decision making to guide instructional planning and intervention design, and understanding struggling readers, including those with reading disabilities. Instruction will be delivered within a context of an ecological, collaborative, problem solving model. Students will be guided to apply both formal and informal assessment in a problem-solving model aimed at the design of robust reading instruction. An emphasis will be placed on creating multi-tiered systems of support (MTSS) for increasing reading achievement among all students. Extensive field experience required. Admission to TEP required.

EEC 540. Advanced Workshop in Education: Methods to Support English Learners. 3 Hours.
Strengthen proficiency in teaching English Learners in the mainstream classroom. Develop understanding of second language acquisition, culturally responsive teaching, accommodations for varying language levels, and appropriate assessments for English Learners. Practice planning, implementing, and managing sheltered instruction. Extensive field experience required. Admission to TEP required.

EEC 593. Individual Readings. 1-3 Hour.
Individualized readings on special topics.

EEC 594. Field Work in Education. 1 Hour.
Observation and teaching experiences with children. Admission to TEP required.

EEC 600. Transition into P-6 Teaching. 3 Hours.
Introduction to the teaching profession (Alternative Master's Program, Elementary/Early Childhood Education).

EEC 610. Curriculum Development in Teaching. 3 Hours.
Curriculum decisions, planning and implementation.

EEC 612. Models of Teaching. 3 Hours.
Developing knowledge of curriculum and instruction. Selecting and applying specific teaching strategies. Field experience required.

EEC 615. Collaborative Learning Spaces - Designing and Developing. 3 Hours.
Introduction to the maker movement in P-6 STEM education. Explorations of the history of the maker movement in K-12 education, collaborative learning spaces, interdisciplinary connections, maker projects, curriculum, instructional strategies, assessment tools, and learning theories that support student-driven projects.

EEC 617. Engineering for P-6 Students. 3 Hours.
Introduction and exploration of the different fields of engineering, concepts, and content related to each field, engineering design process, and practices, the Next Generation Science Standards, curricular materials and resources, the latest research on engineering in P-12 schools, and assessments necessary to design and develop research-based interdisciplinary curricula for students in grades P-6.

EEC 620. Teaching Mathematics K-6. 3 Hours.
Issues and approaches in early childhood and elementary mathematics; research and implementation for instruction.
Prerequisites: EEC 660 [Min Grade: C]

EEC 621. Teaching Language Arts P-12. 3 Hours.
Issues and approaches in teaching early childhood and elementary school language arts. Implications of research for instruction.

EEC 625. Critical Pedagogy Advocacy Collaboration. 3 Hours.
Encompasses current issues in education from critical, postmodern, and feminist perspectives. Issues of advocacy, collaboration, equity, social justice, racism, sexism, and the marginalization of minorities in education will be explored.

EEC 626. Mathematics Coaching Grades K-2. 3 Hours.
Provides content knowledge and pedagogical strategies to empower instructional coaches to improve classroom teacher and instructional coach effectiveness and student achievement in mathematics. Includes authentic assessments requiring utilization of of data and current research to provide intervention to effectively respond to mathematics difficulties. Includes facilitating coaching cycles with initial certification candidates and mentoring novice teachers.

EEC 627. Mathematics Coaching Grades 3-5. 3 Hours.
Content knowledge and pedagogical strategies to empower instructional coaches to improve classroom instruction and student achievement in mathematics. Includes authentic assessment requiring utilization of data and current research to provide intervention to effectively respond to mathematics difficulties. Includes facilitating coaching cycles with colleagues and novice educators.

EEC 633. Classroom Applications of Constructivist Theory. 3 Hours.
This course provides practical classroom applications of constructivist principles in teaching and learning.

EEC 650. Systematic Reflections About Teaching. 3 Hours.
Theory and practice of reflective inquiry in the elementary classroom which includes observations, data collection, analysis, and narrative reporting.Prerequisite: Admission into Graduate School.

EEC 660. Reading in Teaching and Learning. 3 Hours.
Introductory course is designed to assist the student in locating, analyzing, and synthesizing current research in early childhood and elementary education.

EEC 670. Studying the Child in School. 3 Hours.
Analysis of child study in school; values and limitations of assessment. Extensive field experience required.

EEC 671. Creative and Affective Experiences. 1 Hour.
Nature and nurture of creativity through creative learning experiences. Maintaining and preserving creative expression throughout curriculum.

EEC 672. Piaget and Perspectives in Learning. 3 Hours.
Piaget's theory of intellectual or cognitive development; applications to elementary and early childhood education. Field experience required.

EEC 673. Teaching in Diverse Society. 3 Hours.
Examination of effective strategies for working with diverse populations.

EEC 674. Language Development. 3 Hours.
Developmental processes involved in language, relationship to education programs. Field experience required.

EEC 675. Teaching in the Urban School. 3 Hours.
Methods and materials; evaluation of school and school-related programs for equalizing educational opportunity.

EEC 677. Readinesss for Learning. 3 Hours.
Preschool and primary level language development and literacy development; assessment techniques. Field experience required.

EEC 690. Internship in P-3/3-6. 6 Hours.
Supervised teaching in an early childhood (P–3) and/or an elementary (3–6) program. The student gradually assumes responsibility for planning and teaching for the entire class (minimum of 15 weeks). The internship experience includes supervision in working with professional resource professionals and parents. Approval of application for Internship in P–3/3–6 required. All program courses must be completed.
Prerequisites: EDR 540 [Min Grade: C] and EEC 502 [Min Grade: C] and EEC 540 [Min Grade: C] and EEC 506 [Min Grade: C] and EEC 512 [Min Grade: C] and EEC 513 [Min Grade: C] and EDR 543 [Min Grade: C] and EEC 514 [Min Grade: C]

EEC 691. Practicum in ECE/ELEM. 1 Hour.
Practicum in Early Childhood Education and Elementary Education.
Prerequisites: EPR 594 [Min Grade: C](Can be taken Concurrently)

EEC 692. Curriculum Projects. 1-6 Hour.
Field projects in curriculum modifications and improvement of classroom practice.

EEC 693. Independent Studies. 1-3 Hour.
Independent Study in Elementary and Early Childhood Education.

EEC 694. Field Study. 1-6 Hour.
Field study.

EEC 695. Practicum Supervision in ECE/ELE. 2-6 Hours.
Supervision of practicum students.

EEC 696. Internship Seminar. 1-3 Hour.
Course will accompany the 9 semester hour internship (EEC 690) to support and extend the efforts of student teaching. The course will focus on problem-solving related to classroom situations such as classroom management, grading, professionalism and ethics, legal issues, teacher rights, and others that occur during the internship.

EEC 702. Administration and Supervision Prog Young Children. 3 Hours.
Evaluation, decision making, supportive services, staff development, community interaction strategies.

EESL-English as Second Languag Courses

EESL 510. Second Language Acquisition. 3 Hours.
An in-depth look at major theories of second language acquisition. Exploration of learning environments, programs, home language, culture, and other factors that influence second language acquisition. This course entails 30 hours of field experiences. Required for the Alternative Master's.

EESL 512. Curriculum, Program, Policies. 3 Hours.
Introduction to the curriculum, programs, policies, and laws that support new language learners with respect to legal issues, instructional strategies, accommodations, assessments, and support networks and that are grounded in second language acquisition theory. This course entails 5 days of field experiences in an English learner summer program. Required for the Alternative Master's in ESL.

EESL 513. Teaching ESL in a Multicultural Society. 3 Hours.
Designed to introduce students to the goals, principles, and practices of multicultural education and to sensitize students to cultural pluralism in the United States. Required for the Alternative Master's.

EESL 515. Grammar and Linguistics for ESL Teachers. 3 Hours.
A critical study of aspects of Modern English grammar and linguistics that are important for the teaching of English as a Second or Foreign Language. Students will gain an understanding of the major syntactic and semantic phenomena important for teaching ESL/EFL, become familiar with the practical and theoretical literature on teaching English grammar, participate in practical exercises, and develop instructional activities that embed grammar skills into content-driven lessons. Required for the Alternative Master's.

EESL 525. Phonology for Second Language Teachers. 3 Hours.
An introduction to phonology and its application to the teaching of a second or foreign language. Students learn the phonological structure of the English language, analyze examples from language learner data, diagnose pronunciation difficulties experienced by language learners from different first languages, and identify instructional strategies for assisting language learners to perceive and produce challenging sounds. Required for the Alternative Master's.

EESL 530. Methods and Materials of Teaching ESL. 3 Hours.
Examines traditional and current approaches for teaching English to speakers of other languages and curriculum materials, texts, and other resources. This course entails 30 hours of field experiences. Required for the Alternative Master's.

EESL 540. Teaching New Languages Through Reading and Writing. 3 Hours.
Theory, research and practice in reading and writing for second language learners. Implications for teaching reading and writing skills that allow second language learners to participate in the full range of academic situations. This course entails 30 hours of field experiences. Required for the Alternative Master's.

EESL 560. Effective Teaching and Learning. 3 Hours.
This course prepares candidates to plan, teach, and assess second and foreign languages in school settings: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment. This course entails 30 hours of field experience. Required for the Alternative Master's in ESL, French, and Spanish.

EESL 570. Engaging Families and Communities. 3 Hours.
This course prepares professional educators to engage families and communities with the overarching idea of shared responsibility for the English learner's academic success. In this course, UAB candidates will determine what family engagement could look like over time and through multiple levels, starting with individual engagement, the engagement of a school, and of a school system.

EESL 589. Internship Seminar in ESL. 1 Hour.
Provides an opportunity to explore in-depth effective ways to deliver instruction during the internship experience.

EESL 590. Internship in Second and Foreign Languages, N-12. 6 Hours.
Meets the internship requirements of the state code. Interns are engaged in the full scope of teaching activities including planning and delivering lessons, evaluating students, and conducting managerial tasks and other appropriate duties.

EESL 600. TESOL Residency. 0 Hours.
Students in the EdS program's non-certification track must enroll in EESL 008 during the summer term. During their two-week residency at UAB, they will participate in a TESOL institute on campus and also visit TESOL sites off-campus.

EESL 601L. Community English Teaching. 0-1 Hours.
Students co-teach weekly Community English Classes.

EESL 610. Second Language Acquisition. 3 Hours.
An in-depth look at major theories of second language acquisition. Exploration of learning environments, home language, culture, and other factors that influence second language acquisition. This course entails 30 hours of working with English learners in one's own educational context.

EESL 612. Curriculum, Programs and Policies. 3 Hours.
Introduction to the curriculum, programs, policies, and laws that support new language learners with respect to legal issues, support networks, instructional strategies, assessments, and accommodations and that are grounded in second language acquisition theory. This course entails 3 days of field experiences in an English learner summer program.

EESL 613. Teaching ESL in a Multicultural Society. 3 Hours.
Designed to introduce students to the goals, principles, and practices of multicultural education and to sensitize students to cultural pluralism in the United States.

EESL 615. Grammar and Linguistics for ESL Teachers. 3 Hours.
A critical study of aspects of Modern English grammar and linguistics that are important for the teaching of English as a Second or Foreign Language. Students will gain an understanding of the major syntactic and semantic phenomena important for teaching ESL/EFL, become familiar with the practical and theoretical literature on teaching English grammar, participate in practical exercises, and develop instructional activities that embed grammar skills into content-driven lessons.

EESL 617. Teaching English in a Global Context. 3 Hours.
Provides a sociolinguistic perspective on the globalization of English and on the emergence and teaching of English as an International Language. Students explore dialectology, language change, language diversity, language ideology and power, national language policies, World Englishes, the growing number of non-native English speakers, and attitudes of native and non-native English speakers toward the domination of English.

EESL 620. Special Topics in ESL. 3 Hours.
Topics will vary from year to year.

EESL 625. Phonology for Second Language Teachers. 3 Hours.
An introduction to phonology and its application to the teaching of a second or foreign language. Students learn the phonological structure of the English language, analyze examples from language learner data, diagnose pronunciation difficulties experienced by language learners from different first languages, and identify instructional strategies for assisting language learners to perceive and produce challenging sounds.

EESL 627. Teaching Adult Language Learners. 3 Hours.
Introduces goals, principles, and practices for teaching English to adult learners, addresses the influence of varying backgrounds on adult language learning, and examines ways to evaluate adults' second language development. After learning to recognize quality components in distinct program models, as outlined by TESOL Standards for Adult Education ESL Programs, students do a critical study of community-based or other English language programs.

EESL 630. Methods and Materials of Teaching ESL. 3 Hours.
Examines traditional and current approaches to teaching English to speakers of other languages and curriculum materials, texts, and other resources, specifically within PK-12 settings. This course entails 40 hours of field experience working with English learners in one's own school.

EESL 637. Methods Teaching English as an International Language. 3 Hours.
Prepares students to teach English as an International Language by using methods, strategies, and techniques appropriate for adults in ESL contexts and for all learners in EFL contexts both for in-person and online instruction. Engaged with approaches aligned with TESOL Standards for ESL/EFL Teachers of Adults, students review language learning needs for 5 program settings: adult/community, workplace, college/university, intensive English, and English as a Foreign Language. During the semester, students design and implement a curriculum for instruction and assessment of language learning outcomes. This course entails 30 hours of field experiences.

EESL 640. Teaching New Languages Through Reading and Writing. 3 Hours.
Theory, research and practice in reading and writing for second language learners. Implications for teaching reading and writing skills that allow second language learners to participate in the full range of academic situations. This course entails 8 hours of field experiences at another school and 32 hours working with English learners in one's own school.

EESL 641. Teaching Emergent Bilingual Learners in the Early Childhood Setting. 3 Hours.
This course prepares candidates to work effectively with emergent bilingual learners in the early childhood setting. Candidates will gain context knowledge needed to design curriculum, including literacy, appropriate for emergent bilingual learners and will learn how culture and home language impacts learning additional languages.

EESL 643. Promoting Global Peace through TESOL. 3 Hours.
This course guides graduate students in understanding and facilitating the promotion of global peace within and out of the TESOL classroom through listening, speaking, reading and writing. The goal of this course is for educators to learn to use the tools of negotiation, arbitration, and mediation with an overarching focus on peacekeeping, peacemaking, and peacebuilding.

EESL 647. Instruction and Assessment: Reading and Writing. 3 Hours.
Addresses linguistic, sociocultural, psychological, and educational factors that affect literacy development of English as an additional language. Grounded in theoretical and practical aspects of teaching second language (L2) reading and writing to adolescents and adults in diverse communities, students learn to implement effective instructional strategies for promoting literacy in English as an additional language. To measure attainment of L2 reading and writing skills, students learn to design and conduct authentic assessments and to administer standardized assessments. This course entails 30 hours of field experiences.

EESL 650. Strategies for Teaching Math and Science to ELLs. 3 Hours.
Provides knowledge and strategies for making math and science accessible to ELLs at all grade levels, K-12. Classroom teachers will learn to make accommodations for teaching ELLs within a sheltered instruction framework.

EESL 657. Instruction and Assessment: Listening and Speaking. 3 Hours.
Examines how spoken communication is structured so that it is socially appropriate and linguistically accurate. Students learn principles and best practices for the contextualized teaching of second language (L2) listening and speaking skills to adolescent and adult learners. After exploring the purposes, types, and availability of formal testing tools to assess the attainment of these skills in English as an additional language, students also learn to generate and conduct their own tests for assessing L2 listening and speaking. This course entails 30 hours of field experiences.

EESL 660. Effective Teaching and Learning. 3 Hours.
This course prepares candidates to plan teach and assess second and foreign languages in school settings: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment. This course entails 30 hours of field experience. Required for the traditional Master's in ESL.

EESL 670. Engaging Families and Communities. 3 Hours.
This course prepares professional educators to engage families and communities with the overarching idea of shared responsibility for the English learner's academic success. In this course, UAB candidates will determine what family engagement could look like over time (in school years) and through multiple levels, starting with individual engagement, the engagement of a school, and of a school system.

EESL 677. Field Studies. 1-3 Hour.
Students participate in field studies related to the teaching of English as a second or foreign language.

EESL 680. Research in ESL. 3 Hours.
Primary types of research conducted in second language teaching and learning and how these methods can be used to inform teaching. Introduction to classroom-based second language research approaches.

EESL 681. National Boards in English as a New Language. 3 Hours.
This course prepares experienced teachers for National Board Candidacy in English as a New Language (ENL). Students enrolled in this course may be either pre-candidates or candidates for National Board Certification.

EESL 687. English for Specific Purposes. 3 Hours.
This inquiry-focused course guides emerging teachers in experiencing the differentiated facets of working in adult ESL and EFL environments. Students explore English for Specific Purposes and related issues in Intensive English Programs, English for Occupational Purposes, Program Administration, and English as an International Language. Students observe classes in regional IEPs, develop an EOP program, receive hands-on experience in administration, apply research to various adult EIL teaching situations, and do an in-depth study of an EFL context.

EESL 689. Seminar in ESL. 1 Hour.
Provides an opportunity to explore in-depth effective ways to deliver instruction during the internship experience. Must be taken concurrently with EESL 690.
Prerequisites: EESL 610 [Min Grade: C]

EESL 690. Internship in Second and Foreign Languages, P-12. 3 Hours.
Meets the internship requirements of the state code. Interns are engaged in the full scope of teaching activities including planning and delivering lessons, evaluating students, and conducting managerial tasks and other appropriate duties. This course entails 2 weeks of internship in an English learner summer program. Approval of internship application for the traditional master's.

EESL 697. ESL Practium. 1-3 Hour.
In this practicum course, prospective ESL/EFL teachers shadow a professional ESL teacher when teaching an Academic English class. As needed, they also provide specialized support for the ESL students in that class. To enhance their professional growth, these prospective teachers share their reflections and newly-acquired competencies with the EESL 697 course instructor.

EESL 698. Teaching Apprenticeship. 2-3 Hours.
This required teaching apprenticeship is housed in a standards-based course that offers practical application of the knowledge and skills learned in other courses for teaching ESL. After having completed one semester of structured observations of professional ESL educators and participated in corresponding debriefings, novice teachers engage in the full scope of ESL teaching activities. They plan and deliver lessons, assess learners and their language development, and conduct managerial tasks and other appropriate duties.
Prerequisites: EESL 697 [Min Grade: C]

EESL 717. Teaching English in Global Context. 3 Hours.
This course provides a sociolinguistic perspective on the globalization of English and on the emergence and teaching of English as an International Language. Students explore dialectology, language change, language diversity, language ideology and power, national language policies, World Englishes, the growing number of non-native English speakers, and attitudes of native and non-native English speakers toward the domination of English.

EESL 737. Teaching English as an International Language. 3 Hours.
The primary purpose of this course is to guide educators in exploring the teaching of English as a second, new, or foreign language to English learners of all ages. With the goal of expanding an educator's repertoire for teaching speakers of languages other than English, this course considers the relevance of historical approaches and methods used in language teaching during the past century and reviews language methods and approaches used in today's ESL and EFL classrooms. Educators analyze selected methods and approaches in differing contexts that include English as a Second Language (ESL), English as a Foreign Language (EFL), and English as an International Language (EIL) or English as Lingua Franca (ELF).

EESL 743. Promoting Global Peace through TESOL. 3 Hours.
This course guides doctoral students in understanding and facilitating the promotion of global peace within their classroom and educational setting as well as in other settings, both locally and globally.

EESL 747. Instruction and Assessment: Reading and Writing. 3 Hours.
This course explores the linguistic, sociocultural, psychological, and educational factors that affect literacy development in English as a second or foreign language (ESL/EFL). Educators will analyze literacy-learning needs of English learners (ELs) in diverse contexts and multiple age groups and will participate in effective and engaging ways to meet those needs.

EESL 757. Instruction and Assessment: Listening and Speaking. 3 Hours.
Based on linguistic perspectives and language acquisition research from earlier in their careers, educators will use research, experience, and reflection to further inform their own teaching practice in TESOL. To that end, they will explore the complexities of linguistic, sociocultural, psychological, and educational factors that affect ELLs' aural and oral development.

EESL 763. Facilitating Intercultural Communicative Competence. 3 Hours.
This course guides doctoral students in understanding and facilitating their students' intercultural communicative competence within and out of the classroom.

EESL 780. Research in ESL/EFL. 3 Hours.
Exploration of research methods conducted in second and foreign language teaching and applications of these methods to inform teaching in the ESL and/or EFL contexts.

EHS-High School Education Courses

EHS 530. Practicum. 1-2 Hour.
Field experience in school-based setting. Admission to Alternative Master's Program required.
Prerequisites: EDU 500 [Min Grade: C](Can be taken Concurrently)

EHS 535. Methods I Mathematics 6-12. 3 Hours.
Introduction to teaching mathematics in secondary school settings. Developing basic skills in planning, instruction, and assessment. Supervision fee.

EHS 536. Methods I: English Language Arts, 6-12. 3 Hours.
In this course, teacher candidates will explore the essentials of teaching English Language Arts in secondary schools, emphasizing planning, instruction, and assessment, alongside field supervision. This course establishes a foundation in content pedagogical skills and a deep connection between ELA research, theory, and practice. Teacher candidates will craft relevant, rigorous, and responsive lesson plans, considering diverse needs, interests, and experiences of students. Because this course is comprehensive, teacher candidates will gain valuable field experience with 40-50+ hours of direct engagement, preparing for the dynamic challenges in English Language Arts instruction. Admission to AMP required.

EHS 537. Methods I: Science, 6-12. 3 Hours.
Introduction to teaching science in secondary school settings. Developing basic skills in planning, instruction, and assessment. Admission to Alternative Master's Program required. Field supervision fee.

EHS 538. Methods I: Social Science, 6-12. 3 Hours.
This course explores theory and best teaching practices with disciplinary literacy and inquiry-based teaching practices for the secondary social studies classroom. This course emphasizes structuring into all components of lesson planning the historical thinking, literacy, and argumentation skills used by historians to analyze historical and contemporary issues and events. Pre-service teachers will apply these best teaching practices into their field placement requirements.

EHS 556. Classroom Mgt in Sec Schools. 3 Hours.
This course places an emphasis on exploring strategies to mitigate classroom management issues in the secondary classroom. Additionally, candidates explore ways to design procedures and develop norms to create and govern an inclusive and safe secondary classroom.

EHS 565. Methods II: Mathematics, 6-12. 3 Hours.
Preparation to plan, teach and assess mathematics in secondary school settings: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment.
Prerequisites: EHS 535 [Min Grade: C]

EHS 566. Methods II: English Language Arts, 6-12. 3 Hours.
In this course, teacher candidates will explore the essentials of teaching English Language Arts in secondary schools, emphasizing planning, instruction, and assessment, alongside field supervision. This course goes beyond basics, focusing on developing content pedagogical skills and a deep connection between ELA research, theory, and practice. Teacher candidates will hone in on the arts and sciences of instruction and designing effective and equitable assessments that include the diverse needs, interests, and experiences of students. Because this course is comprehensive, students will continue growing in their field experience with 50-60+ hours of direct engagement, preparing for the dynamic challenges in English Language Arts instruction.
Prerequisites: EHS 536 [Min Grade: C]

EHS 567. Methods II: Science, 6-12. 3 Hours.
Preparation to plan, teach and assess science in secondary school settings: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment.
Prerequisites: EHS 537 [Min Grade: C]

EHS 568. Methods II: Social Science, 6-12. 3 Hours.
This course focuses on theory and best teaching practices with disciplinary thinking skills and inquiry-based teaching practices for the secondary social studies classroom. This course stresses structuring into all components of lesson planning the civic thinking, literacy, and argumentation skills employed by political scientists to analyze historical and contemporary issues and events. Pre-service teachers will apply these best teaching practices into their field placement requirements.
Prerequisites: EHS 538 [Min Grade: C]

EHS 570. Practicum II. 1 Hour.
Field experience in school-based setting.

EHS 597. Special Problems in Education: Diversity. 3 Hours.
Seminar for graduate students; readings and research projects based on special interests. May be repeated for total of 6 hours. Field Supervision Fee.

EHS 600. Secondary Education Curriculum and Methods I. 3 Hours.
Introductory course in Alternative Masters Program for secondary school education. Developing basic teaching skills and understanding of interdependence among all levels within school and community. Course requires 40 hours of field experiences beyond class meetings.

EHS 612. Advanced Methods: English Language Arts, Grades 6-12. 3 Hours.
Advanced methods for teaching English language arts in grades 6-14. Includes curriculum development, classroom interaction, pedagogical activities, technology applications, source materials, current research, society issues, and cognitive development of students. Current classroom teaching required. Changed to Grades 6-12 (rather than 14) to align with secondary education grade levels.

EHS 614. Advanced Methods: Social Sciences, Grades 6-12. 3 Hours.
Advanced methods for teaching the social sciences in grades 6-14. Includes curriculum development, classroom interaction, pedagogical activities, technology applications, source materials, current research, society issues, and cognitive development of students. Current classroom teaching required.

EHS 615. Advanced Methods: Science, Grades 6-12. 3 Hours.
Advanced methods for teaching science in grades 6-14. Includes curriculum development, classroom interaction, pedagogical activities, technology applications, source materials, current research, society issues, and cognitive development of students. Current classroom teaching required.

EHS 616. Advanced Methods: Mathematics, Grades 6-12. 3 Hours.
Advanced methods for teaching mathematics in grades 6-14. Includes curriculum development, classroom interaction, pedagogical activities, technology applications, source materials, current research, society issues, and cognitive development of students. Current classroom teaching required.
Prerequisites: EHS 565 [Min Grade: C]

EHS 651. Innovative Practices in Teaching in Secondary School. 3 Hours.
Innovative practices in planning, instructing, and evaluating high school area studies. May be repeated if taken in different areas of study.

EHS 680. National Board Seminar for Secondary Education. 3 Hours.
Course involves 18 Saturday seminars during the school year to prepare teachers for National Board Candidacy and to support candidates as they go through the certification process. Students enrolled in this course may be either pre-candidates or candidates for National Board Certification.

EHS 681. Special Topics in Education. 1-6 Hour.
Prerequisite: Permission of instructor.

EHS 690. Intern Seminar in Sec Edu. 1-3 Hour.
Observation and teaching in secondary school (15 weeks minimum). Includes attendance at several seminars on campus. Unconditional acceptance in Alternative Master's Program and approval of application for internship required.

EHS 691. Secondary School Internship. 3-9 Hours.
Observation and teaching in secondary school (15 weeks minimum). Includes attendance at a weekly seminar on campus. Prerequisites: Unconditional acceptance in 5th-Year Program and approval of application for internship.

EHS 692. Field Studies (Selected Educational Settings). 1-3 Hour.
Field Studies.

EHS 693. Advanced Field Experience. 3 Hours.
Field Studies.

EHS 698. Individual Research in Education. 1-6 Hour.
Research Prerequisite: Permission of instructor.

EHS 720. Individual Research in Education. 3-6 Hours.
Research Prerequisites: Master's degree and permission of instructor.

ESP-Edu School Psychometry Courses

ESP 600. Seminar in School Psychometry. 3 Hours.
This course is designed to address the professional roles and services of school psychometrists including the historical foundations, ethical guidelines and standards, legal issues, roles and functions, and contemporary professional issues in the field of school psychometry. Emphasis is placed upon skills to consult, collaborate, and communicate effectively with others to problem solve, plan, and promote accountability systems (such as PowerSchool) and decision-making processes with diverse school personnel, families, community professionals in their work in regards to diverse issues in learning, development, and behavior. Candidates will learn to serve as advocates for students and for the school psychometrist's professional role.

ESP 627. Practicum in Schl Psych. 1 Hour.
The purpose of this one-hour course is to ensure that the candidate has met proficiency criteria in areas related to conducting non-biased psychological and psycho-educational assessment including formal assessment instruments, procedures, and techniques in interviews, observations, behavior evaluations, personal-social adjustment, intelligence, adaptive behavior, language, environmental-cultural factors, and vocational interests. Emphasis is placed upon the context in which assessments take place and their use.

ESP 628. Indiv Assess Child/Youth I. 3 Hours.
This course is designed to prepare candidates to conduct psychological and psycho-educational assessments on children and youth in a school setting. Candidates are prepared to appropriately select, administer, and interpret non-biased formal assessment instruments, procedures, and techniques such as interviews, observations, assessments of personal-social adjustment, cognition, behavior, language, academic achievement, environmental-cultural influences and vocational interests. Emphasis is placed on using assessment data for decision making, accountability, special education eligibility decisions, and intervention planning. Technology is utilized within this course to enhance the assessment and decision-making processes.

ESP 629. Indiv Assess Child/Youth II. 3 Hours.
In this course, candidates are prepared to use assessment data for decision making, accountability, special education eligibility decisions, intervention planning, and the facilitation of the delivery of special education services. Candidates will be taught to develop direct and indirect interventions for individuals, small groups, and whole-class that will enhance cognitive, affective, social, and vocational development. The candidates will prepare an in-service to help parents and teachers implement the developed interventions. Candidates will be taught to apply diversity knowledge (culture, ethnicity, language, disability characteristics, SES, etc.) in development and learning when engaging in databased decision making and intervention and service planning. Technology is integrated and utilized within this course to enhance assessment, decision-making processes, and intervention planning.

ESP 630. Applied Neuropsychology in the School. 3 Hours.
ESP 630 is designed to provide foundational content in organization of the human nervous system and brain behavior relationships to inform functional skills in interpretation of cognitive test performance from neuropsychological perspective and administration of screening tests. This course will also include hands-on practical administration, scoring, and interpretation of the well-known neuropsychological test battery: NEPSY-II. Upon completion of this course, students should be familiar with how such assessments relate to educational diagnoses, special education eligibility, interventions and recommendations. Minimum grade of C required.

ESP 631. Crisis Intervention & Prevention in Schools. 3 Hours.
This 3 hour course will train candidates in the PREPaRE School Crisis Prevention & Intervention Model on how to establish and serve on school safety and crisis response teams. Incorporates (a) prevention (b) protection, (c) mitigation, (d) response, and (e) recovery. It also incorporates the U.S. Department of Education's Readiness and Emergency Management for Schools (REMS) guidance, and the Incident Command System (ICS) as delineated by the National Incident Management System (NIMS) from the Federal Emergency Management Agency (FEMA). Upon completion of this course candidates will receive PREPaRE Certificates of Completion. Minimum grade of C required.

ESP 632. Consultation & Intervention for Learning & Behavior Problems. 3 Hours.
This 3 hour course will provide candidates with the knowledge base needed to design, implement, and evaluate effective academic interventions and prevention programs. The course is designed to build on consultation and assessment skills to work with teachers to develop programs for students in general and special education. Issues pertaining to interventions with students from culturally diverse groups will be presented. Minimum grade of C required.

ESP 689. Internship-School Psychometry. 3-9 Hours.
This culminating course is a daily, 300-hour participatory experience in a school setting supervised by a certified, qualified School Psychometrist. Under the supervision of an appropriately credentialed and trained Internship Site Supervisor, candidates must demonstrate competency in all identified knowledge and ability standards for school psychometrists. Interns are engaged in the full scope of school psychometry activities including individual assessment, data-based decision-making, accountability, special education referral and eligibility meetings, and other appropriate duties. Interns will independently complete all components of 10 special education re-evaluations (case studies) for diverse special education students at the placement site. Interns also participate in a monthly seminar hosted by the University Supervisor, where the candidates evaluate and synthesize a cumulative body of research and its findings as a foundation for service delivery.

IDD-Instructional Design Dev Courses

IDD 600. Trends and Issues in Instructional Design. 3 Hours.
This course defines the field of instructional design and learning design by exploring its history, current trends and future issues in the field. The course provides insights from leaders in the field, case studies on instructional design in different fields, and interactive activities on the systematic approaches to instructional design.

IDD 610. Instructional Design. 3 Hours.
Instructional Design is a project-based course that includes step-by-step strategies to create learning experiences using design models, instructional strategies, and technology applications. Learners will study the processes of analysis, design, development, implementation, and evaluation in order to apply real-world learning experience design solutions to instructional challenges.

IDD 620. Universal Differential Instructional Design and Development. 3 Hours.
This course gives students an experience in research-based learning design methods and alternative assessment strategies designed to meet the varied instructional needs and preferences of all learners in today's educational environments.

IDD 630. Performance System Technology. 3 Hours.
This course provides students with practical methods of analyzing and solving human performance problems with an emphasis on development of both non-instructional and instructional interventions. An overview of concepts and current issues related to the design and development of learning and performance systems at the macro-level is also provided, allowing learners to explore learning and performance from a broad organizational perspective.

IDD 640. Learning, Cognition, and Instructional Design and Development. 3 Hours.
This course surveys the learning sciences literature that is especially relevant for instructional designers. The course covers major theoretical perspectives in the learning sciences and has students read original empirical research. The goal is to prepare IDD students to utilize learning sciences literature in their careers.

IDD 650. Alternate Instructional Design and Development Models. 3 Hours.
This course affords students the opportunity to apply a variety of well-established and emerging learning design and development models.

IDD 660. Assessment and Evaluation in Instructional Design & Development. 3 Hours.
Students will learn how to assess human attitudes, knowledge and performance, analyze practical data, and evaluate learning and human performance programs.

IDD 670. Multimedia Design and Development for Instruction and Training. 3 Hours.
This course will present techniques for the integration of learning design theory and practice with the current and emerging delivery systems. Students will develop skills and explore software necessary to develop and produce an original interactive learning product.

IDD 680. Instructional Design and Development Elective. 3 Hours.
Content will be diversified opportunities to take advantage of specific areas of expertise of faculty, availability of experts in areas not covered in other course work, or original projects that become available.

IDD 690. Research Practicum. 1-3 Hour.
The research practicum is a supervised learning experience in an actual or similar setting to those which instructional designers, learning experience designers, and learning scientists are employed.

LDLS-Learning Dsgn Learning Sc Courses

LDLS 620. Learning Design Research Methods. 3 Hours.
This course surveys research methodologies used in the Learning Sciences and learning design, with an emphasis on design-based research. Students will collect and analyze qualitative data, conduct learning experience network analysis, and use research to drive iterative design improvements.

LDLS 630. Design Thinking for Engaged Learning. 3 Hours.
This course investigates the synergies between design thinking and learning experience design. This course emphasizes the utilization of design thinking methodologies as both a design tool and a subject of instruction to foster deep engagement and intrinsic motivation. In this course, students will explore design thinking processes and mindsets and apply them to create engaging, learner-centered learning experiences.

LDLS 680. Game-Based Learning. 3 Hours.
In this course, students will unpack the intricacies of game-based learning (GBL), differentiating it from gamification and examining its potential for identity exploration. Students will design immersive learning experiences that leverage the intrinsic motivations and affordances provided by both experiential and generative game-based learning.

LDLS 681. Learning Design With and For Augmented Intelligence. 3 Hours.
This course is a foray into the cutting-edge intersection of the Learning Sciences and artificial intelligence (AI), characterized by a framing of AI as augmented intelligence. Students will develop AI literacy and leverage AI tools for designing learning experiences and design experiences that incorporate AI, all within a framework of extended and distributed cognition.

LDLS 682. Complex Systems. 3 Hours.
This course provides a complex systems perspective on learning contexts. Students will engage with various complex systems theories, including complex dynamical systems, complex adaptive systems, and complex conceptual systems. Students will analyze learning as a complex system and design experiences that embrace this complexity.

LDLS 683. Designing for Creativity in Learning. 3 Hours.
This course investigates the nuances of creativity in learning experiences and contexts. It focuses on frameworks, evaluations, and designs to nurture creative mindsets, creative environments, creative processes, and creative cognition. Students will utilize the Creativity Landscape framework to analyze and design learning experiences that are optimized for fostering creative thinking and action.

LDLS 684. Theory Building in the Learning Sciences. 3 Hours.
This course focuses on theory-building methodologies within the Learning Sciences. It explores approaches to developing new theories and building on existing theories to advance learning design and the Learning Sciences. Students will engage with grounded theory and design-based research methodologies to contribute to the body of theoretical knowledge in the field.

LDLS 685. Frontiers in the Learning Sciences. 3 Hours.
This course explores emerging topics, paradigms, methodologies, and debates in the learning sciences through a combination of readings, discussions, and hands-on activities. The specific content evolves each year to reflect the latest research and innovations in the field.

Arts Education

Our UAB Arts Education Program will prepare you for a career as a music teacher or visual arts teacher in the P-12 schools. Our instructors are nationally and internationally renowned teacher educators, scholars, performers, and artists who are active in their respective fields. The UAB Department of Music is accredited and nationally recognized by the National Association of Schools of Music, has the distinction of being Alabama's first All Steinway School, and offers courses such as music theory and basic and advanced conducting. The UAB Department of Art and Art History is accredited and nationally recognized by the National Association of Schools of Art and Design and has studio courses in ceramics, drawing, painting, new media, photography, graphic design, sculpture, and printmaking as well as courses in art history.

Music Education

UAB's Graduate Music Education program consists of a Master of Arts in Education (MAEd) degree in Arts Education for teaching Music (choral and instrumental). This MAEd in Music leads to teacher certification from

the Alabama State Department of Education for teaching choral and instrumental music in grades P-12. It consists of an alternative track for teachers seeking initial teacher certification and a traditional track for certified teachers seeking advanced certification.

The Arts Education program in Music is housed in the Department of Curriculum and Instruction (School of Education) and is implemented in collaboration with the Music Department (College of Arts and Sciences). This program's first purpose is to train educators in meeting the evolving needs of learners in grades P-12 within today's rapidly changing society. Its second purpose is to deliver cutting-edge instruction through a standards-based, inquiry-focused approach that prepares educators to use state-of-the-art instructional strategies in their own classrooms. Its third purpose is to ensure that a quality program is available to pre-service within commuting distance of UAB and to in-service teachers across the state of Alabama.

Prospective students should contact the Program Director, Dr. Susan Spezzini, at spezzini@uab.edu (205-934-8357), or the Chair of the Department of Curriculum and Instruction, Dr. Kathleen Clark, at kclark5@uab.edu (205-996-8786), or the Education Coordinator in the Music Department, Dr. Cara Morantz, at morantz@uab.edu (205-996-5827).

UAB Department of Music

For detailed information regarding admission requirements for the School of Education and Human Sciences graduate programs, please visit the Admissions Requirements website at https://www.uab.edu/education/studentservices/admission-requirements.

Master of Arts in Education: Arts Education - Music Traditional Master's Program

The MA.Ed. requires 30-33 hours for the Arts Education traditional master's program in Music Education with concentrations in Choral Music and Instrumental Music. The minimum GPA required for certification is 3.25.

Requirements		Hours
MU 521	Foundations of Graduate Study in Music	3
MU 629	Music Research	3
Music History		**3**
MU 561	Music Literature Seminar	
MU 564	American Music	
MU 566	Music in World Cultures	
Music Theory		**3**
MU 545	Modal Counterpoint	
MU 548	Orchestration	
MU 555	Form and Analysis	
MU 558	Contemporary Techniques	
Applied Music (student's field)		**3**
MUP 520	Concert Choir	
MUP 521	Chamber Singers	
MUP 535	Wind Symphony	
MUP 536	Jazz Ensemble	
MUP 540	Private Lessons: Voice	
MUP 561	Private Lessons: Flute	
MUP 562	Private Lessons: Oboe	
MUP 563	Private Lessons: Clarinet	
MUP 564	Private Lessons: Saxophone	
MUP 566	Private Lessons: Bassoon	
MUP 571	Private Lessons: Trumpet	
MUP 572	Private Lessons: French Horn	
MUP 573	Private Lessons: Trombone	
MUP 574	Private Lessons: Euphonium	
MUP 575	Private Lessons: Tuba	
MUP 580	Private Lessons: Percussion	
MUP 591	Private Lessons: Violin	
MUP 592	Private Lessons: Viola	
MUP 593	Private Lessons: Cello	
MUP 594	Private Lessons: Bass	
MU 615	Technology in Music Instruction	3
MU 631	Advanced Methods of Teaching Music N-6	3
Choral or Instrumental Music Methods Course		**3**
MU 662	Advanced Methods of Teaching Secondary Choral Music	
MU 663	Advanced Methods for Teaching Secondary Instrumental Music	
ECY 600	Introduction to Exceptional Learner [1]	3
ALSDE-approved Diversity Course		**3**
EDF 600	Urban Education	
EDF 602	Critical Social Issues in American Education	
EDF 606	Social Movements in Education	
EDF 620	Culture and American Education: Race Class and Gender	
ECT 625	Positive Behavioral Supports	
EESL 613	Teaching ESL in a Multicultural Society	
Advisor-approved Elective		**3**
600+ level Education Course		
500+ level Music Couse		
MU 551	Topics in Music Theory	
MU 565	The Evolution of Jazz	
MU 599	Independent Studies	
MUP 550	Private Lessons: Piano	
MUP 595	Private Lessons: Guitar	
Total Hours		**33**

[1] ECY 600 required if Survey of Special Education course not completed previously.

Master of Arts in Education: Arts Education - Music Fifth Year Alternative Master's Program

The M.A.Ed. requires a minimum of 46 hours for the Arts Education Fifth Year Alternative Master's program in Music Education with concentrations in Choral Music and Instrumental Music. A minimum GPA of 3.25 is required.

Requirements		Hours
MU 531	Methods of Teaching Music	3
EHS 597	Special Problems in Education	3
EDR 521	Reading in Context Areas	1
EDU 500	Education as a Profession	1
MU 521	Foundations of Graduate Study in Music	3
EPR 511	Measurement and Evaluation in Education Secondary Ed	3

ECY 600	Introduction to Exceptional Learner [1]	3
EHS 690	Intern Seminar in Sec Edu	1
EMU 690	Internship in Music Education	6
MU 629	Music Research	3
MU 615	Technology in Music Instruction	3
Music Theory (choose 3 hours)		**3**
MU 545	Modal Counterpoint	
MU 548	Orchestration	
MU 555	Form and Analysis	
MU 558	Contemporary Techniques	
Music History (choose 3 hours)		**3**
MU 561	Music Literature Seminar	
MU 564	American Music	
MU 566	Music in World Cultures	
Applied Music (student's field)		**2**
MUP 540	Private Lessons: Voice	
MUP 550	Private Lessons: Piano	
MUP 561	Private Lessons: Flute	
MUP 562	Private Lessons: Oboe	
MUP 563	Private Lessons: Clarinet	
MUP 564	Private Lessons: Saxophone	
MUP 566	Private Lessons: Bassoon	
MUP 571	Private Lessons: Trumpet	
MUP 572	Private Lessons: French Horn	
MUP 573	Private Lessons: Trombone	
MUP 574	Private Lessons: Euphonium	
MUP 575	Private Lessons: Tuba	
MUP 580	Private Lessons: Percussion	
MUP 591	Private Lessons: Violin	
MUP 592	Private Lessons: Viola	
MUP 593	Private Lessons: Cello	
MUP 594	Private Lessons: Bass	
Music Ensemble (student's field) choose 2 hours		**2**
MUP 520	Concert Choir	
MUP 535	Wind Symphony	
MUP 536	Jazz Ensemble	
Total Hours		**40**

A concentration is required

Requirements		Hours
Choral Concentration		
MU 532	Methods I: Choral Music	3
MU 562	Methods II: Choral Music	3
Total Hours		**6**

Requirements		Hours
Instrumental		
MU 533	Methods I: Instrumental Music	3
MU 563	Methods II: Instrumental Music	3
Total Hours		**6**

[1] May not be required if previously completed

EMU-Music Education Courses

EMU 503. Methods Teaching Music N-6 Lab. 1 Hour.
Provides public school observation experiences for music education students. Note: Fees will apply.

EMU 690. Internship in Music Education. 3-9 Hours.
Internship in Music Education. Seminar attendance required.

MU-Music Courses

MU 510. Music Technology Workshop. 1-3 Hour.

MU 521. Foundations of Graduate Study in Music. 3 Hours.
Examines the history and contemporary philosophy of music education in the public schools.

MU 529. Choral Tech and Materials. 3 Hours.
Advanced study of the techniques of choral conducting including appropriate gestures, score study, performance practice, choral diction, voice building for choirs, literature selection, rehearsal techniques and working with various types of instrumental accompaniment.

MU 530. Methods of Instrumental Music. 3 Hours.
A study of the instrumental music environment, with an emphasis on administrative topics, materials and literature.

MU 531. Methods of Teaching Music. 3 Hours.
Teaching music in the elementary school environment. Investigation of critical elements in the teaching and learning process as related to music in grades N-6. Permission of instructor required.

MU 532. Methods I: Choral Music. 3 Hours.
Introduction to teaching choral music to adolescent learners. Developing basic skills in planning, instruction, and assessment.

MU 533. Methods I: Instrumental Music. 3 Hours.
Introduction to teaching instrumental music to adolescent learners. Developing basic skills in planning, instruction, and assessment.

MU 545. Modal Counterpoint. 3 Hours.
Important characteristics of vocal polyphonic writing based on modal scales with emphasis on style of Palestrina and other Renaissance composers.
Prerequisites: MU 322 [Min Grade: C]

MU 548. Orchestration. 3 Hours.
Scoring techniques for orchestra, band, and other instrumental groups.

MU 551. Topics in Music Theory. 3 Hours.
Aspects of music theory and analysis. May be repeated for credit.
Prerequisites: MU 322 [Min Grade: C] and MU 325 [Min Grade: C]

MU 555. Form and Analysis. 3 Hours.
Principles and techniques of organization in tonal music; analytical methods.
Prerequisites: MU 322 [Min Grade: C]

MU 558. Contemporary Techniques. 3 Hours.
Techniques and materials employed in contemporary music, including nonfunctional and nontertian harmony, polyharmony, atonal and serial music, microtones, sound-mass composition, and contemporary notation.

MU 561. Music Literature Seminar. 3 Hours.
Selected topics concerning specific periods, genres, and forms. May be repeated for credit.

MU 562. Methods II: Choral Music. 3 Hours.
Preparation to plan, teach and assess choral music with adolescent learners: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment.
Prerequisites: MU 532 [Min Grade: C]

MU 563. Methods II: Instrumental Music. 3 Hours.
Preparation to plan, teach, and assess instrumental music with adolescent learners: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment.
Prerequisites: MU 533 [Min Grade: C]

MU 564. American Music. 3 Hours.
Music in the United States from colonial times to the present.

MU 565. The Evolution of Jazz. 3 Hours.
Origins and survey of jazz types and styles. Lectures, recordings, and readings.
Prerequisites: MU 165 [Min Grade: C]

MU 566. Music in World Cultures. 3 Hours.
Characteristics of musical styles found in various cultures throughout the world.

MU 599. Independent Studies. 1-3 Hour.
Directed studies in music. Permission of Department Chair based on written proposal submitted to registration.

MU 615. Technology in Music Instruction. 3 Hours.
Explores ongoing innovations in technology as applied to music instruction.

MU 629. Music Research. 3 Hours.
A study of music research, including both qualitative and quantitative techniques.

MU 631. Advanced Methods of Teaching Music N-6. 3 Hours.
This course engages advanced pedagogical methods and practices for teaching elementary school music.

MU 662. Advanced Methods of Teaching Secondary Choral Music. 3 Hours.
The purpose of this course is to engage the experienced music teacher to delve further into the procedures for operating a successful choral music program in the middle or high school level of public and private school teaching.

MU 663. Advanced Methods for Teaching Secondary Instrumental Music. 3 Hours.
This class is an advanced instrumental methods course focusing on application of the elements of the Education Teacher Performance Assessment (EdTPA), a portfolio-based teacher performance assessment created by the Stanford Center for Assessment Learning and Equity. The course will include advanced content relevant to current best practices and standards for teaching instrumental music.

MUP-Music Courses

MUP 520. Concert Choir. 1 Hour.
Performs choral music representing a variety of periods and styles.

MUP 520L. Concert Choir Learning Lab. 0 Hours.

MUP 521. Chamber Singers. 1 Hour.
Advanced choral group. Performs variety of choral music representing different periods and styles. By audition only. Advanced music-reading skills required. May be repeated for credit.

MUP 535. Wind Symphony. 1-2 Hour.
Performs finest concert band literature. Open to students of all majors. May be repeated for credit.

MUP 535L. Wind Symphony Learning Lab. 0 Hours.
Required Learning Lab for MUP 535 Wind Symphony. Performs finest concert band literature. Open to students of all majors.

MUP 536. Jazz Ensemble. 1 Hour.
Performs classic and contemporary jazz, swing, and rhythm and blues. May be repeated for credit.

MUP 540. Private Lessons: Voice. 1-2 Hour.
Private instruction in voice.

MUP 550. Private Lessons: Piano. 1-2 Hour.
Private instruction in piano.

MUP 561. Private Lessons: Flute. 1-2 Hour.
Private instruction in flute.

MUP 562. Private Lessons: Oboe. 1-2 Hour.
Private instruction in oboe.

MUP 563. Private Lessons: Clarinet. 1-2 Hour.
Private instruction in clarinet.

MUP 564. Private Lessons: Saxophone. 1-2 Hour.
Private instruction in saxophone.

MUP 566. Private Lessons: Bassoon. 1-2 Hour.
Private instruction in bassoon.

MUP 571. Private Lessons: Trumpet. 1-2 Hour.
Private instruction in trumpet.

MUP 572. Private Lessons: French Horn. 1-2 Hour.
Private instruction in french horn.

MUP 573. Private Lessons: Trombone. 1-2 Hour.
Private instruction in trombone.

MUP 574. Private Lessons: Euphonium. 1-2 Hour.
Private instruction in euphonium.

MUP 575. Private Lessons: Tuba. 1-2 Hour.
Private instruction in tuba.

MUP 580. Private Lessons: Percussion. 1-2 Hour.
Private instruction in percussion.

MUP 591. Private Lessons: Violin. 1-2 Hour.
Private instruction in violin.

MUP 592. Private Lessons: Viola. 1-2 Hour.
Private instruction in viola.

MUP 593. Private Lessons: Cello. 1-2 Hour.
Private instruction in cello.

MUP 594. Private Lessons: Bass. 1-2 Hour.
Private instruction in bass.

MUP 595. Private Lessons: Guitar. 1-2 Hour.
Private instruction in guitar.

Arts Education - Visual Arts

UAB's Visual Arts Education program is housed within the Department of Curriculum and Instruction (School of Education) and is implemented in collaboration with the Department of Art and Art History (College of Arts and Sciences). This Visual Arts Education program consists of a Master of Arts in Education (MAEd) degree in Arts Education. Also called the Alternative Master's program, this MAEd in Arts Education provides initial

teacher certification from the Alabama State Department of Education for teaching the visual arts in grades P-12.

The first purpose of this Visual Arts Education program is to provide a quality program to pre-service teachers across the state of Alabama by making online instruction available for all education courses and several art courses. Its second purpose is to prepare art teachers in meeting the evolving needs of learners in grades P-12 within today's rapidly changing society. Its third purpose is to deliver cutting-edge instruction through a standards-based, inquiry-focused approach that prepares educators to use state-of-the-art instructional strategies in their own classrooms.

Prospective students should contact the Program Director, Dr. Susan Spezzini, at spezzini@uab.edu (205-934-8357), or the Chair of the Department of Curriculum and Instruction, Dr. Kathleen Clark, at kclark5@uab.edu (205-996-8786), or the Chair of the Department of Art and Art History, Dr. Rich Gere, at rgere@uab.edu (205-975-3492).

For detailed information regarding admission requirements for the School of Education and Human Sciences graduate programs, please visit the Admissions Requirements website at https://www.uab.edu/education/studentservices/admission-requirements.

Master of Arts in Education: Arts Education - Visual Arts Fifth Year Alternative Master's Program

The M.A.Ed. requires a minimum of 35-38 hours for the Arts Education Alternative Masters program with a concentration in Visual Arts.

Requirements		Hours
ECY 600	Introduction to Exceptional Learner [1]	3
EDA 534	Methods I: Visual Arts	3
EDA 564	Methods II: Visual Arts	3
EHS 597	Special Problems in Education: Diversity [2]	3
EHS 556	Classroom Mgt in Sec Schools	3
EDR 521	Reading in Content Areas	1
EPR 511	Measurement and Evaluation in Education Secondary Ed (OR)	3
EPR 510	Measurement and Evaluation in Education ECE	
EDA 690	Internship in Art Education N-12	6
EHS 690	Intern Seminar in Sec Edu	1
Advisor-approved 500+ level visual art courses		**12**
1 Required if not completed previously. If course was completed prior to unconditional admission to Alt-A program, another approved diversity course is required.		
2 EHS 597 meets the ALSDE diversity course requirement, and this course is required in this program.		
Total Hours		**38**

Master of Arts in Education: Arts Education - Visual Arts Traditional Master's Program

The M.A.Ed. requires a minimum of 30 hours for the Arts Education program with a concentration in Visual Arts. A GPA of 3.25 is required.

Requirements		Hours
Advisor-approved Visual Arts Courses at the 500+ level		**12**
EDA 680	Advanced Methods: Visual Arts	3
EDC 606	The Dynamics of Educational Change	3
EDC 651	Innovative Practices in Instruction	3
EDC 655	Curriculum Principles and Practices	3
ECY 600	Introduction to Exceptional Learner [1]	3
ALSDE-approved Course in Diversity		**3**
EDF 600	Urban Education	
EDF 602	Critical Social Issues in American Education	
EDF 606	Social Movements in Education	
EDF 620	Culture and American Education: Race Class and Gender	
ECT 625	Positive Behavioral Supports	
EESL 613	Teaching ESL in a Multicultural Society	
Research course		**3**
EPR 594	Introduction to Educational Research Design	
Total Hours		**33**

[1] Not required if previously completed

Courses

EDA 534. Methods I: Visual Arts. 3 Hours.
Introduction to teaching visual arts in school settings. Developing basic skills in planning, instruction, and assessment. Admission to Alternative Master's Program required.

EDA 564. Methods II: Visual Arts. 3 Hours.
Preparation to plan, teach and assess the visual arts in school settings: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment.

EDA 584. Methods of Teaching Art Lab. 1 Hour.
Methods of Teaching Art Lab required.

EDA 680. Advanced Methods: Visual Arts. 3 Hours.
Advanced methods for teaching the visual arts in grades 6-14. Includes curriculum development, classroom interaction, pedagogical activities, technology applications, source materials, current research, society issues, and cognitive development of students. Current classroom teaching required.
Prerequisites: GAC M

EDA 690. Internship in Art Education N-12. 3-9 Hours.
For Alternative Master's Program students. Observation and student teaching in elementary and secondary schools (15 full weeks in school setting). Approval of internship application required.

Early Childhood Education

UAB's Early Childhood Education program (M.A.Ed., Ed.S., Ph.D.) embodies a three-fold purpose. Its first purpose is to prepare educators in meeting the evolving needs of learners, primarily in grades P-6, within today's rapidly changing society. Its second purpose is to deliver cutting-edge instruction through a standards-based, inquiry-focused approach. Based on constructivism, this approach prepares prospective and experienced educators to use state-of-the-art instructional strategies in their own classrooms. Its third purpose is to ensure that a quality program is available to pre-service and in-service teachers who may be unable to attend class during traditional class hours. This program is unique in how it combines online support from the learning management system (i.e. Canvas)with a variety of delivery formats:

- blended courses (online alternating with face-to-face)
- professional learning communities
- flexible summer programming

- internships and practicums
- totally online platforms
- Saturday classes

These purposes are expanded through the Ed.S. program. This advanced degree program infuses an inquiry-focused approach that prepares teachers for assuming leadership roles in curriculum development and instructional delivery. It also provides experienced teachers with collaborative skills and mentoring techniques for serving as reflective practitioners to guide change and positively impact student achievement and school improvement. Teachers with Class A certification can pursue Ed.S. level certification in elementary education or early childhood education. By then pursuing the Ph.D. program in early childhood education, they can then explore relevant issues, theories, and practice at an even higher level.

For detailed information regarding admission requirements for the graduate programs, please visit the Admissions Requirements website at https://www.uab.edu/education/studentservices/admission-requirements.

Master of Arts in Education in Early Childhood Education

The Early Childhood Education Master of Arts in Education program requires a minimum of 30 hours. A minimum GPA of 3.25 is required.

Requirements		Hours
ECE 620	Introduction to Curriculum and Teaching in Cultural & Familial Contexts	3
ECE 630	Cognitive Curriculum ECE	3
EEC 670	Studying the Child in School	3
EEC 677	Readinesss for Learning	3
EESL 641	Teaching Emergent Bilingual Learners in the Early Childhood Setting [1]	3
Teaching Field Focus - Select One Area [2]		**9**
Choice 1 - Teaching Multilingual Learners		
EESL 610	Second Language Acquisition	
EESL 630	Methods and Materials of Teaching ESL	
EESL 640	Teaching New Languages Through Reading and Writing	
Choice 2 - Literacy for Diverse Populations		
EDR 652	Pre and Early Reading Instruction	
EDR 654	Dyslexia Research, Education & Advocacy	
ECE 632	Young Children and Their Literature	
Choice 3 - Early Childhood Program Leadership		
ECE 631	Programs for Young Children	
EDC 695	Coaching for Effective Instruction	
EDL 657	Law & Ethics for School Leaders	
Choice 4 - Education, Environment & Services for Infants & Toddlers		
ECE 548	Infant/Toddler Development	
ECE 549	Edu Environment: Inf/Todd/Par	
ECE 694	Practicum in Play-based Education for the Young Child	
Survey of Special Education Course (required if not completed previously)		**0-3**
ECY 600	Introduction to Exceptional Learner [3]	
Research		
EPR 594	Introduction to Educational Research Design	3
Practicum [4]		**3**
ECE 690	Infant-Toddler Practicum	
ECE 692	Practicum in Primary Education	
Total Hours		**30-33**

1 Approved diversity course
2 Advisor approved substitutions allowed at the 600 or 700 level within the four areas.
3 May not be required if previously completed
4 Offered as three, one-hour courses. Two hours from age range taught during academic year and one hour in summer outside typical age range.

Master of Arts in Education in Early Childhood Alternative Master's (Fifth Year)

Requirements		Hours
Curruiculum		
ECE 620	Introduction to Curriculum and Teaching in Cultural & Familial Contexts	3
Diverse Populations		
EESL 641	Teaching Emergent Bilingual Learners in the Early Childhood Setting	3
Literacy		
EDR 540	Developmental Reading I	1-4
Professionalism		
EDU 500	Education as a Profession	1-3
EEC 650	Systematic Reflections About Teaching	3
Using Assessment Data to Improve Student Learning		
EPR 510	Measurement and Evaluation in Education ECE	3
Survey of Special Education Coursework [1]		
ECY 600	Introduction to Exceptional Learner	3
Internship		
ECE 693	Internship in Early Childhood Education	3-9
Teaching Field Courses		
At least 1/3 of the program shall be in teaching field courses:		
ECE 633	Social and Emotional Development of the Young Child	3
ECE 670	Studying the Young Child in School	3
EEC 671	Creative and Affective Experiences	3
ECE 631	Programs for Young Children	3
EEC 502	Primary Math Methods	1-4
ECE 632	Young Children and Their Literature	3
ECE 546	Comm Arts/Reading Young Child	3-6
ECE 545	Curriculum for Young Children: Math Science and SS	3-6
EEC 594	Field Work in Elementary and Early Childhood Education	1-6

Master of Arts in Education in Early Childhood/Elementary Educational Alternative Master's (Fifth Year)

The M.A.ED. degree requires a minimum GPA of 3.25 for the Early Childhood/Elementary Education Alternative Master's (Fifth Year).

Requirements		Hours
ECY 600	Introduction to Exceptional Learner [1]	3
EEC 502	Primary Math Methods	3
EEC 505	Children's Literature in Elem. and Early Childhood	3
EEC 506	Language Arts in Elementary and Early Childhood Ed.	3

EEC 512	Math in EC and Elementary Educ	3
EEC 513	Science in EC and Elem Edu	3
EEC 514	Soc Studies in EC and Elem Edu	3
EEC 515	Learning Environments through Positive Behavior Support	3
EEC 540	Workshop in Education: Strategies for English Learners	1
Field Work [2]		**2-8**
EEC 594	Field Work in Elementary and Early Childhood Education [1]	
EEC 600	Transition into P-6 Teaching	3
EEC 612	Models of Teaching	3
EEC 650	Systematic Reflections About Teaching	3
EEC 690	Internship in P-3/3-6	6
EDR 540	Developmental Reading I	3
EDR 543	Developmental Reading II	3
EDU 500	Education as a Profession	1
EPR 510	Measurement and Evaluation in Education ECE	3
Total Hours		**52-58**

1 May not be required if previously completed

2 Each semester a student enrolls in a pedagogy course (i.e., EDR 540, EDR 543, EEC 502, EEC 506, EEC 512, EEC 513, or EEC 514, EEC 540), he or she must also enroll for one hour of EEC 594

Doctor of Philosophy in Early Childhood Education

As candidates may enter the Ph.D. program from a variety of early childhood related fields, there are a number of basic prerequisites required for all applicants. If a Ph.D. applicant has completed most / all of the following coursework, they may enter the program and start their Ph.D. coursework the first semester. If Ph.D. applicants have not taken courses similar to the ones listed below, then the applicant can be accepted into the program and is expected to complete the majority of the prerequisite coursework prior to taking doctoral level classes. Determination of whether the following coursework has been completed will be made by the Program Director from a review of transcripts. Applicants may be asked to identify and submit additional documentation (course syllabi) to substantiate course credit toward prerequisite.

Requirements		Hours
Prior Studies and prerequisite requirements- up to 27 credit hours		
EEC 300	Child Development/Family Relationships	3
EPR 594	Introduction to Educational Research Design	3
EPR 596	Introduction to Qualitative Methods in Educational Research	3
EPR 608	Introduction to Statistical Methods in Educational Research	3
EPR 609	Statistical Methods and Research in Education: Intermediate	3
EEC 610	Curriculum Development in Teaching	3
or ECE 620	Introduction to Curriculum and Teaching in Cultural & Familial Contexts	
or EEC 612	Models of Teaching	
ECE 630	Cognitive Curriculum ECE	3
or EEC 672	Piaget and Perspectives in Learning	
or EEC 633	Classroom Applications of Constructivist Theory	
EEC 660	Reading in Teaching and Learning	3
ECE 791	Field Studies in Early Childhood Education	3

PhD Coursework - Minimum of 57 hours

If all prerequisites are met, the Ph.D. is a minimum of 57 hours made up of core, specialty, research, and dissertation hours. Students may apply for candidacy after 36 hours, with up to 6 hours being non-dissertation research credits.

Requirements		Hours
Core courses - 15 credit hours		
ECE 730	Doctoral Seminar I: Issues in Development Theory	3
ECE 731	Doctoral Seminar II: Children and Society	3
ECE 732	Doctoral Seminar III: History of Early Childhood Education	3
ECE 749	Advanced Early Childhood Curriculum	3
ECE 790	Internship in Early Childhood Education and Development	3
Interest Area - 9+ hours at the doctoral 730+ level. Other coursework at the discretion of the Program Director.		
Select one of the following:		**3**
ECE 740	Research Apprenticeship	
or ECE 792	Directed Readings in Research	
Select two of the following:		**6**
ECE 735	Meaning and Development of Play (Select two of the following:)	
ECE 738	The Consultation Process and the Young Child	
ECE 748	Research in Infancy	
ECE 750	Literacy Before School	
ECE 752	Theory Research Literacy Developement Instruction	
*Advisor and Program Director approved interest area course at 600 or 700 level		
Research Methodology		**12**
EPR 696	Qualitative Research: Inquiry and Analysis	
EPR 710	Computer Applications and Advanced Statistical Methods	
EPR 792	Mixed Methods Approaches to Educational Research	
Select one of the following:		
EPR 695	Survey Methods in Educational Research	3
or EPR 792	Mixed Methods Approaches to Educational Research	
or ECE 740	Research Apprenticeship	
*Advisor and Program Director approved research course at the 600 or 700 level (not including listed prerequisite)		
Principles of Scientific Integrity		
GRD 717	Principles of Scientific Integrity	
Research Internship		**6**
ECE 798	Non-Dissertation Research (Semester prior to application to candidacy)	
Dissertation		**12**
ECE 799	Dissertation Research (Prerequisite: Admission to candidacy. Two consecutive semesters of at least 6 credit hours each.)	
Total Hours		**57**

ECE-Early Childhood Educ Courses

ECE 545. Curriculum for Young Children: Math Science and SS. 3 Hours.
Basic knowledge of curriculum and concepts of mathematics, science, and social studies for young children. Child growth and development as basis for planning and teaching mathematics, science, and social studies to young children. Teaching methods and use of instructional media. Extensive field experience required. Admission to TEP required.

ECE 546. Comm Arts/Reading Young Child. 3-6 Hours.
Nature of reading and language arts experiences for children grades Pre-K-3. Media, materials, experiences, programs, and strategies to facilitate development of communicative abilities with emphasis on preserving and maintaining creative expression. Integration of learning in areas of listening, speaking, reading, composition, literature, handwriting, spelling, and other communication arts. Laboratory experiences required.

ECE 548. Infant/Toddler Development. 3 Hours.
Study of human development within an ecological context from before birth to three years of age. Course covers social-emotional, physical, cognitive, language, and creative development of the infant and toddler in the home and also in programs for very young children.

ECE 549. Edu Environment: Inf/Todd/Par. 3 Hours.
Study of infant (or toddler) development as it relates to the organization of a parent/infant (or toddler) educational program. Information concerning program management, observation of parent/infant (or toddler) interaction, development and sequencing of activities, creation and evaluation of materials, and an examination of techniques and procedures for parent involvement and education. Actual experience in working with a parent/infant (or toddler) program will be an integral part of the course.
Prerequisites: ECE 548 [Min Grade: C]

ECE 620. Introduction to Curriculum and Teaching in Cultural & Familial Contexts. 3 Hours.
Developing knowledge of early childhood curricula for young children and their families in a variety of cultural contexts. Relationship of child growth and development and family empowerment in planning and implementation of curriculum. Field experience required.

ECE 630. Cognitive Curriculum ECE. 3 Hours.
Mathematics and science for young children based on constructivism. Topics include children's thinking, particularly in physical-knowledge, group games, and situations in daily living. Development of moral autonomy is also included. Field experiences required.
Prerequisites: EPR 594 [Min Grade: C](Can be taken Concurrently)

ECE 631. Programs for Young Children. 3 Hours.
Basic knowledge of organizing and administering early childhood programs, infancy through third grade, in a variety settings. Provides an overview of functions of program administration including pedagogy, accreditation, organizational development and systems, human resources, collaboration, and advocacy. Field experiences required.

ECE 632. Young Children and Their Literature. 3 Hours.
Literature for children infancy through third grade; selection, use, and integration of literature in total curriculum. Using literature for reading and writing instruction. Field experiences required.

ECE 633. Social and Emotional Development of the Young Child. 3 Hours.
Topics include the study of social and emotional development, the child's ability to react to and interact with the social environment, temperament, attachment, emotional regulation, and social competence. Field experiences required.

ECE 670. Studying the Young Child in School. 3 Hours.
This course provides an overview of key issues related to analysis of child study in school and the values and limitations of assessment. Candidates will engage in in-depth experiences in evaluating the growth and development of children. Field experience required.

ECE 690. Infant-Toddler Practicum. 1 Hour.
Early Childhood Practicum in birth to age 3 settings.

ECE 691. Practicum Supervision in ECE. 1-3 Hour.
Supervision of practicum students.

ECE 692. Practicum in Primary Education. 1 Hour.
Early childhood practicum in Kindergarten to third grade settings.

ECE 693. Internship in Early Childhood Education. 6 Hours.
Supervised teaching in an early childhood (P–3) program. The student gradually assumes responsibility for planning and teaching for the entire class (minimum of 15 weeks). The internship experience includes supervision in working with resource professionals and parents. Approval of application for Internship in ECE required. All program courses must be completed. Admission to TEP required.

ECE 694. Practicum in Play-based Education for the Young Child. 3 Hours.
Investigate the intrinsic nature of play in the lives of young children; engage in play observations, analyze contemporary theories of play & development, and plan and implement a play-based curriculum inclusive of creativity, curiosity, play, social negotiation, and problem-solving.

ECE 730. Doctoral Seminar I: Issues in Development Theory. 3 Hours.
Special Topics in Early Childhood and Development Studies. Specific topic announced in class schedule. Admission to ECE Doctoral Program required.
Prerequisites: GAC Z

ECE 731. Doctoral Seminar II: Children and Society. 3 Hours.
Special Topics in Early Childhood and Development Studies. Specific topic announced in class schedule. Admission to ECE Doctoral Program required.

ECE 732. Doctoral Seminar III: History of Early Childhood Education. 3 Hours.
Survey of historical, philosophical, and sociocultural foundation of early childhood programs and policies. Admission to ECE Doctoral Program required.

ECE 734. Logic and Scientific Inquiry. 3 Hours.
Scientific investigation as applied in education. Conceptual issues in research process. Methods of analysis and presentation.

ECE 735. Meaning and Development of Play. 3 Hours.
Nature of play, its importance and how it is nurtured.

ECE 737. Parent Child and School Interface. 3 Hours.
Historical development of parent involvement. Theoretical bases of family-school interactions.

ECE 738. The Consultation Process and the Young Child. 3 Hours.
Skills for working with families, teachers, and professionals in community agencies that serve infants, toddlers, and young children.

ECE 740. Research Apprenticeship. 3-6 Hours.
Planning, implementation, analysis, and presentation of research.

ECE 746. Contemporary Issues in Science Education. 3 Hours.
Crisis atmosphere surrounding science education in American classroom.

ECE 748. Research in Infancy. 3 Hours.
Theoretical and empirical evidence relating to developmental domains for young children.

ECE 749. Advanced Early Childhood Curriculum. 3 Hours.
Historical, philosophical, psychological, and social thought influencing curriculum in early childhood education.

ECE 750. Literacy Before School. 3 Hours.
Written language development of preschool children.

ECE 751. School and Literacy Instruction. 3 Hours.
Primary-level literacy instruction and children's literacy development. Prerequisites: Admission to doctoral program in early childhood education and two courses in language development.

ECE 752. Theory Research Literacy Developement Instruction. 3 Hours.
Philosophical and psychological beliefs regarding literacy development.

ECE 760. Current Issues in Education. 2-3 Hours.
Current Issues in Early Childhood Education and Advocacy.

ECE 774. Advanced Seminar in Language Development. 3 Hours.
Relationship of thinking and knowing to language development; strategies for analysis; strengths and weaknesses of techniques of examining language development.

ECE 790. Internship in Early Childhood Education and Development. 3-9 Hours.
Internship.

ECE 791. Field Studies in Early Childhood Education. 1-6 Hour.
Individual Field Projects.

ECE 792. Directed Readings in Research. 3 Hours.
Review of research in early childhood education to gain understanding of conceptual and methodological basis.

ECE 793. Individual Research in Early Childhood Education. 3 Hours.
Recent research in early childhood education; systematic solutions to problems in education.

ECE 794. Current Research Topics in Early Childhood Education. 1-3 Hour.
Philosophical aspects of scientific methods in education; functions of paradigms, theories, and models in inquiry; theory development and validation; major types of experimental and nonexperimental inquiry appropriate to study of educational phenomena.

ECE 798. Non-Dissertation Research. 1-12 Hour.
The course provides for supervised research experience under the direction of a graduate faculty member within the School of Education. The topic for an ECE 798 course must relate to the discipline or specializations within early childhood education and child development.

ECE 799. Dissertation Research. 1-12 Hour.
Doctoral research. Admission to candidacy and IRB approval for dissertation research required.
Prerequisites: GAC Z

EEC-Elem Early Childhood Courses

EEC 502. Primary Math Methods. 3 Hours.
Materials and methods on emergent numeracy. Extensive field experience required.
Prerequisites: TEP 0

EEC 505. Children's Literature in Elem. and Early Childhood. 3 Hours.
Materials and methods. Needs of children, selection of books, societal issues in children s literature, and role of media in children's literature. Field experiences required. Admission to TEP required.
Prerequisites: EDU 500 [Min Grade: C] and EEC 650 [Min Grade: C]

EEC 506. Language Arts in Elementary and Early Childhood Ed.. 1-4 Hour.
Materials and methods. Communication-based approach in developing effective language arts program. All aspects of language arts program addressed. Field experience required. Admission to TEP required.
Prerequisites: EEC 600 [Min Grade: C] and EEC 612 [Min Grade: C] and EEC 650 [Min Grade: C]

EEC 512. Math in EC and Elementary Educ. 3 Hours.
Material and methods of teaching mathematics. Emphasizes scope, sequence, and content of the mathematics program. Computation skills and problem solving are stressed. Extensive field experience required. Admission to TEP required.

EEC 513. Science in EC and Elem Edu. 3 Hours.
Scope, sequence, materials, and methods. Emphasis on teaching and the development of content and process skills. Extensive field experience required. Admission to TEP required.

EEC 514. Soc Studies in EC and Elem Edu. 3 Hours.
Scope, sequence, and content of elementary school social studies curriculum. Teaching strategies, program articulation, and instructional planning. Extensive field experience required. Admission to TEP required.

Prerequisites: EEC 612 [Min Grade: C]

EEC 515. Learning Environments through Positive Behavior Support. 3 Hours.
Theoretical approaches that focus on child centered curriculum, classroom management, discipline strategies and cultural, linguistic, and developmentally appropriate instruction. Extensive field experience required. Admission to TEP required.

EEC 521. Methods of Teaching Foundations of Reading Development. 3 Hours.
This 3-hour foundations of reading methods course will prepare educators with content knowledge of scientific and evidence-based foundations of the cognitive, linguistic, socio-cultural, and motivational influences for early language and literacy development. The course presents scientifically proven instructional methods, strategies, techniques, and materials, with focused considerations for brain processes of reading, that are needed to successfully teach reading to P-6 students. Specific topics will include the teaching oral language development (expressive and receptive), concepts about print, early orthography, and beginning reading skills (phonemic awareness, alphabet knowledge, high frequency words, phonics, decoding, and encoding/spelling). Extensive field experience required.

EEC 522. Methods of Teaching the Development of Reading Comprehension. 3 Hours.
This three-hour course will prepare educators to teach foundations of reading development using evidence-based instructional practices. Specific topics include promoting academic language development, including vocabulary development; promoting comprehension and analysis of literacy and informational texts; and developing the reading-writing connection. Extensive field experience required.

EEC 523. Methods of Reading Assessment, Instruction, & Intervention. 3 Hours.
This course will address the use of formal and informal assessment procedures used to design and evaluate robust reading instruction and intervention for children in preschool through high school. The focus of the course includes the knowledge and skills needed to choose and administer appropriate reading assessments for a variety of purposes, data-based decision making to guide instructional planning and intervention design, and understanding struggling readers, including those with reading disabilities. Instruction will be delivered within a context of an ecological, collaborative, problem solving model. Students will be guided to apply both formal and informal assessment in a problem-solving model aimed at the design of robust reading instruction. An emphasis will be placed on creating multi-tiered systems of support (MTSS) for increasing reading achievement among all students. Extensive field experience required. Admission to TEP required.

EEC 540. Advanced Workshop in Education: Methods to Support English Learners. 3 Hours.
Strengthen proficiency in teaching English Learners in the mainstream classroom. Develop understanding of second language acquisition, culturally responsive teaching, accommodations for varying language levels, and appropriate assessments for English Learners. Practice planning, implementing, and managing sheltered instruction. Extensive field experience required. Admission to TEP required.

EEC 593. Individual Readings. 1-3 Hour.
Individualized readings on special topics.

EEC 594. Field Work in Education. 1 Hour.
Observation and teaching experiences with children. Admission to TEP required.

EEC 600. Transition into P-6 Teaching. 3 Hours.
Introduction to the teaching profession (Alternative Master's Program, Elementary/Early Childhood Education).

EEC 610. Curriculum Development in Teaching. 3 Hours.
Curriculum decisions, planning and implementation.

EEC 612. Models of Teaching. 3 Hours.
Developing knowledge of curriculum and instruction. Selecting and applying specific teaching strategies. Field experience required.

EEC 615. Collaborative Learning Spaces - Designing and Developing. 3 Hours.
Introduction to the maker movement in P-6 STEM education. Explorations of the history of the maker movement in K-12 education, collaborative learning spaces, interdisciplinary connections, maker projects, curriculum, instructional strategies, assessment tools, and learning theories that support student-driven projects.

EEC 617. Engineering for P-6 Students. 3 Hours.
Introduction and exploration of the different fields of engineering, concepts, and content related to each field, engineering design process, and practices, the Next Generation Science Standards, curricular materials and resources, the latest research on engineering in P-12 schools, and assessments necessary to design and develop research-based interdisciplinary curricula for students in grades P-6.

EEC 620. Teaching Mathematics K-6. 3 Hours.
Issues and approaches in early childhood and elementary mathematics; research and implementation for instruction.
Prerequisites: EEC 660 [Min Grade: C]

EEC 621. Teaching Language Arts P-12. 3 Hours.
Issues and approaches in teaching early childhood and elementary school language arts. Implications of research for instruction.

EEC 625. Critical Pedagogy Advocacy Collaboration. 3 Hours.
Encompasses current issues in education from critical, postmodern, and feminist perspectives. Issues of advocacy, collaboration, equity, social justice, racism, sexism, and the marginalization of minorities in education will be explored.

EEC 626. Mathematics Coaching Grades K-2. 3 Hours.
Provides content knowledge and pedagogical strategies to empower instructional coaches to improve classroom teacher and instructional coach effectiveness and student achievement in mathematics. Includes authentic assessments requiring utilization of of data and current research to provide intervention to effectively respond to mathematics difficulties. Includes facilitating coaching cycles with initial certification candidates and mentoring novice teachers.

EEC 627. Mathematics Coaching Grades 3-5. 3 Hours.
Content knowledge and pedagogical strategies to empower instructional coaches to improve classroom instruction and student achievement in mathematics. Includes authentic assessment requiring utilization of data and current research to provide intervention to effectively respond to mathematics difficulties. Includes facilitating coaching cycles with colleagues and novice educators.

EEC 633. Classroom Applications of Constructivist Theory. 3 Hours.
This course provides practical classroom applications of constructivist principles in teaching and learning.

EEC 650. Systematic Reflections About Teaching. 3 Hours.
Theory and practice of reflective inquiry in the elementary classroom which includes observations, data collection, analysis, and narrative reporting.Prerequisite: Admission into Graduate School.

EEC 660. Reading in Teaching and Learning. 3 Hours.
Introductory course is designed to assist the student in locating, analyzing, and synthesizing current research in early childhood and elementary education.

EEC 670. Studying the Child in School. 3 Hours.
Analysis of child study in school; values and limitations of assessment. Extensive field experience required.

EEC 671. Creative and Affective Experiences. 1 Hour.
Nature and nurture of creativity through creative learning experiences. Maintaining and preserving creative expression throughout curriculum.

EEC 672. Piaget and Perspectives in Learning. 3 Hours.
Piaget's theory of intellectual or cognitive development; applications to elementary and early childhood education. Field experience required.

EEC 673. Teaching in Diverse Society. 3 Hours.
Examination of effective strategies for working with diverse populations.

EEC 674. Language Development. 3 Hours.
Developmental processes involved in language, relationship to education programs. Field experience required.

EEC 675. Teaching in the Urban School. 3 Hours.
Methods and materials; evaluation of school and school-related programs for equalizing educational opportunity.

EEC 677. Readinesss for Learning. 3 Hours.
Preschool and primary level language development and literacy development; assessment techniques. Field experience required.

EEC 690. Internship in P-3/3-6. 6 Hours.
Supervised teaching in an early childhood (P–3) and/or an elementary (3–6) program. The student gradually assumes responsibility for planning and teaching for the entire class (minimum of 15 weeks). The internship experience includes supervision in working with professional resource professionals and parents. Approval of application for Internship in P–3/3–6 required. All program courses must be completed.
Prerequisites: EDR 540 [Min Grade: C] and EEC 502 [Min Grade: C] and EEC 540 [Min Grade: C] and EEC 506 [Min Grade: C] and EEC 512 [Min Grade: C] and EEC 513 [Min Grade: C] and EDR 543 [Min Grade: C] and EEC 514 [Min Grade: C]

EEC 691. Practicum in ECE/ELEM. 1 Hour.
Practicum in Early Childhood Education and Elementary Education.
Prerequisites: EPR 594 [Min Grade: C](Can be taken Concurrently)

EEC 692. Curriculum Projects. 1-6 Hour.
Field projects in curriculum modifications and improvement of classroom practice.

EEC 693. Independent Studies. 1-3 Hour.
Independent Study in Elementary and Early Childhood Education.

EEC 694. Field Study. 1-6 Hour.
Field study.

EEC 695. Practicum Supervision in ECE/ELE. 2-6 Hours.
Supervision of practicum students.

EEC 696. Internship Seminar. 1-3 Hour.
Course will accompany the 9 semester hour internship (EEC 690) to support and extend the efforts of student teaching. The course will focus on problem-solving related to classroom situations such as classroom management, grading, professionalism and ethics, legal issues, teacher rights, and others that occur during the internship.

EEC 702. Administration and Supervision Prog Young Children. 3 Hours.
Evaluation, decision making, supportive services, staff development, community interaction strategies.

Educational Studies (Non-Certification)

The Master of Arts in Education (MAEd) in Educational Studies is an MAEd without state-issued teacher certification for education-related employment that does not require certification. This MAEd promotes UAB's mission by providing support for the teaching and application of knowledge at the campus, state, regional, and global levels.

Through this MAEd, current and future educators who have a completed undergraduate degree, but no need for state-issued educator certification, can prepare for seeking meaningful employment within the field of education, mainly as teachers or coordinators in private schools or other types of educational entities. Overseas employment opportunities are available to international students who, as current or future educators, pursue this Educational Studies MAEd for career advancement in their own countries. This master's is not associated with state certification.

This Educational Studies MAEd consists of a 15-hour core with one course from each of these five areas:

1) Curriculum Design, Program Implementation, and Methods (3 credit hours)

2) Assessment and Measurement (3 credit hours)

3) Diverse Populations (3 credit hours)

4) Special Education (3 credit hours), and

5) Core/Practicum/Capstone (3 credit hours).

This MAEd program consists of a concentration (12 credit hours), which includes these five concentration options: Early Childhood Education, Elementary Education, Secondary Education, Special Education, and Physical Education. Finally, this MAEd also requires one elective course (3 credit hours).

This MAEd degree program facilitates the type of flexibility needed by graduate students to focus their coursework in a way that is most beneficial to them professionally and to their respective constituencies. These concentrations prepare educators for designing educational programs and delivering instruction in diverse settings that do not require state-issued educator certification.

Students in the Educational Studies MAEd are expected to demonstrate competencies in the following areas:

1. Knowledge in curriculum design and implementation, assessment and measurement, diverse populations, and special education,
2. Knowledge for designing and implementing instruction in the selected concentration.
3. Skills for delivering instruction.
4. Knowledge and skills to be competitive when seeking admission to advanced degree programs.

Master of Arts in Education in Educational Studies Non-Certification

Requirements		Hours
Curriculum Design/Program Implementation/Methods		**3**
Select one from the following:		
ECT 521	IEP Programming and Lesson Planning	
EDC 651	Innovative Practices in Instruction	
EDR 551	Reading in Content Areas	
EEC 612	Models of Teaching	
ECE 620	Introduction to Curriculum and Teaching in Cultural & Familial Contexts	
EESL 512	Curriculum, Program, Policies	
or EESL 6	Curriculum, Programs and Policies	
EESL 637	Methods Teaching English as an International Language	
KIN 511	Elementary School Physical Education	
Assessment and Measurement		**3**
Select one from the following:		
ECT 520	Formative and Summative Assessment	
EESL 657	Instruction and Assessment: Listening and Speaking	
EPR 510	Measurement and Evaluation in Education ECE	
or EPR 511	Measurement and Evaluation in Education Secondary Ed	
EPR 594	Introduction to Educational Research Design	
KIN 509	Assessment in Physical Education	
Diverse Populations		**3**
Select one of the following:		
ECT 523	Instructional Methods	
ECT 527	Collaborative Processes	
EDF 600	Urban Education	

EDF 602	Critical Social Issues in American Education	
EDF 606	Social Movements in Education	
EDF 616	Comparative Education	
EDF 620	Culture and American Education: Race Class and Gender	
EEC 540	Advanced Workshop in Education: Methods to Support English Learners	
EESL 513	Teaching ESL in a Multicultural Society	
or EESL 6	Teaching ESL in a Multicultural Society	
EESL 617	Teaching English in a Global Context	
EHS 597	Special Problems in Education: Diversity	
KIN 649	Advanced Adapted Physical Education	
Special Education		
ECY 600	Introduction to Exceptional Learner	3
Core/Practicum/Capstone		**3**
Select one from the following:		
ECT 625	Positive Behavioral Supports	
EEC 674	Language Development	
EESL 510	Second Language Acquisition	
or EESL 6	Second Language Acquisition	
EESL 525	Phonology for Second Language Teachers	
or EESL 625	Phonology for Second Language Teachers	
EHS 556	Classroom Mgt in Sec Schools	
KIN 520	Fitness and Motor Skill Acquisition	
Concentration		**12**
Early Childhood Education [1]		
Elementary Education [2]		
Secondary Education [3]		
Special Education [4]		
Physical Education [5]		
Major Elective [6]		**3**
Total Hours		**30**

1. **Early Childhood Courses:** Advisor approved selections from ECE 500:697, ECT 500:697 ECY 500:697, EDC 500:697, EDF 500:697, EDR 500:697, EDT 500:697, EDU 500:697, EEC 500:697, EESL 500:697, ELE 500:697, EPR 500:697.
2. **Elementary Education Courses:** Advisor approved selected from ECE 500:697, ECT 500:697, ECY 500:697, EDC 500:697, EDF 500:697, EDR 500:697, EDT 500:697, EDU 500:697, EEC 500:697, EESL 500:697, ELE 500:697, EPR 500:697.
3. **Secondary Education Courses**: Advisor approved courses selected from **Education** ECT 500:697, ECY 500:697, EDA 500:697, EDC 500:697, EDF 500:697, EDR 500:697, EDT 500:697, EDU 500:697, EESL 500:699, EHS 500:697, IDD 600:699; EMS 500:697, EPR 500:697, GEO 500:697; **Arts & Sciences** ANTH 500:697, ARH 500:697, ARS 500:697, BY 500:697, CH 500:697, CJ 500:697, CM 500:697, EH 500:697, ES 500:697, FR 500:697, HY 500:697, MA 500:697, MPA 500:697, PH 500:697, PSC 500:697, PY 500:697, SOC 500:697, SPA 500:697, THR 500:697) and **Business** EC500:697.
4. **Special Education Courses:** Advisor approved courses selected from: ECT 500:697, ECY 500:697, EDF 500:697, EDR 500:697, EDU 500:697, EPR 500:697, ESP 500:697.
5. **Physical Education Courses:** Advisor approved courses selected from: EDF 500:697, EDR 500:697, EPR 500:697, KIN 500:697.
6. **Major Elective Courses:** Advisor approved course selected from ECE 500:697, ECT 500:697, ECY 500:697, EDC 500:697, EDF 500:697, EDR 500:697, EDT 500:697, EDU 500:697, EEC 500:697, EESL 500:698, ELE 500:697, EHS 500:697, ESP 500-699, IDD 600:699, EMS 500:697, EPR 500:697, KIN 500:697.

Elementary Education

UAB's Elementary Education graduate programs embody a three-fold purpose. Its first purpose is to train educators in meeting the evolving needs of learners, primarily in grades K-6, within today's rapidly changing society. Its second purpose is to deliver cutting-edge instruction through a standards-based, inquiry-focused approach. Based on constructivist theory, the master's and educational specialist programs prepare prospective and experienced educators to use effective instructional strategies in their own classrooms. Its third purpose is to ensure that a quality program is available to pre-service and in-service teachers who may be unable to attend class during traditional class hours. This program is unique in how it combines online support from the learning management system (i.e., Canvas) with a variety of delivery formats:

- blended courses (online alternating with face-to-face)
- professional learning communities
- flexible summer programming
- internships and practicums
- totally online platforms

The three-fold purposes are expanded through the education specialist (EdS) program. The advanced degree EdS infuses an inquiry-focused approach that prepares teachers for assuming leadership roles in curriculum development and instructional delivery. It also provides experienced teachers with collaborative skills and mentoring techniques for serving as reflective practitioners to guide change and positively impact student achievement and school improvement. Teachers with Class A (master's degree level) certification can pursue EdS-level certification in elementary education.

For detailed information regarding admission requirements for the School of Education and Human Sciences graduate programs, please visit the Admissions Requirements website at https://www.uab.edu/education/studentservices/admission-requirements.

Master of Arts in Education in Elementary Education

The MAEd degree in Elementary Education requires a minimum of 30 hours.

Requirements		Hours
Teaching Field		
EEC 612	Models of Teaching	3
EEC 672	Piaget and Perspectives in Learning	3
EEC 670	Studying the Child in School	3
EEC 674	Language Development	3
EESL 620	Special Topics in ESL [1]	3
Teaching Field Focus - Select One Area [2]		**9**
Choice 1 - Teaching Multilingual Learners		
EESL 610	Second Language Acquisition	
EESL 630	Methods and Materials of Teaching ESL	
EESL 640	Teaching New Languages Through Reading and Writing	
Choice 2 - Literacy for Diverse Populations		
EDR 652	Pre and Early Reading Instruction	
EDR 654	Dyslexia Research, Education & Advocacy	

EESL 640	Teaching New Languages Through Reading and Writing	
Choice 3 - Teacher Leadership		
EEC 675	Teaching in the Urban School	
EDC 695	Coaching for Effective Instruction	
Advisor Approved Elective		
Choice 4 - STEM Teaching		
EEC 615	Collaborative Learning Spaces - Designing and Developing	
EEC 617	Engineering for P-6 Students	
EEC 620	Teaching Mathematics K-6	
Choice 4 - Supporting Individuals with Exceptionalities		
ECT Elective Course		
ECT Elective Course		
ECT Elective Course		
Additional Courses		
EPR 594	Introduction to Educational Research Design	3
Practicum		
EEC 691	Practicum in ECE/ELEM [3]	3
Survey of Special Education Course (required if not completed previously)		
ECY 600	Introduction to Exceptional Learner [4]	3
Total Hours		**33**

[1] Approved diversity course
[2] Advisor approved substitutions allowed at the 600 or 700 level within the four areas.
[3] Offered as three, one-hour courses. Two hours from age range taught during academic year and one hour is summer outside typical age range, K-2 or 3-6.
[4] Not required if previously completed

Courses

EEC 502. Primary Math Methods. 3 Hours.
Materials and methods on emergent numeracy. Extensive field experience required.
Prerequisites: TEP 0

EEC 505. Children's Literature in Elem. and Early Childhood. 3 Hours.
Materials and methods. Needs of children, selection of books, societal issues in children s literature, and role of media in children's literature. Field experiences required. Admission to TEP required.
Prerequisites: EDU 500 [Min Grade: C] and EEC 650 [Min Grade: C]

EEC 506. Language Arts in Elementary and Early Childhood Ed.. 1-4 Hour.
Materials and methods. Communication-based approach in developing effective language arts program. All aspects of language arts program addressed. Field experience required. Admission to TEP required.
Prerequisites: EEC 600 [Min Grade: C] and EEC 612 [Min Grade: C] and EEC 650 [Min Grade: C]

EEC 512. Math in EC and Elementary Educ. 3 Hours.
Material and methods of teaching mathematics. Emphasizes scope, sequence, and content of the mathematics program. Computation skills and problem solving are stressed. Extensive field experience required. Admission to TEP required.

EEC 513. Science in EC and Elem Edu. 3 Hours.
Scope, sequence, materials, and methods. Emphasis on teaching and the development of content and process skills. Extensive field experience required. Admission to TEP required.

EEC 514. Soc Studies in EC and Elem Edu. 3 Hours.
Scope, sequence, and content of elementary school social studies curriculum. Teaching strategies, program articulation, and instructional planning. Extensive field experience required. Admission to TEP required.

Prerequisites: EEC 612 [Min Grade: C]

EEC 515. Learning Environments through Positive Behavior Support. 3 Hours.
Theoretical approaches that focus on child centered curriculum, classroom management, discipline strategies and cultural, linguistic, and developmentally appropriate instruction. Extensive field experience required. Admission to TEP required.

EEC 521. Methods of Teaching Foundations of Reading Development. 3 Hours.
This 3-hour foundations of reading methods course will prepare educators with content knowledge of scientific and evidence-based foundations of the cognitive, linguistic, socio-cultural, and motivational influences for early language and literacy development. The course presents scientifically proven instructional methods, strategies, techniques, and materials, with focused considerations for brain processes of reading, that are needed to successfully teach reading to P-6 students. Specific topics will include the teaching oral language development (expressive and receptive), concepts about print, early orthography, and beginning reading skills (phonemic awareness, alphabet knowledge, high frequency words, phonics, decoding, and encoding/spelling). Extensive field experience required.

EEC 522. Methods of Teaching the Development of Reading Comprehension. 3 Hours.
This three-hour course will prepare educators to teach foundations of reading development using evidence-based instructional practices. Specific topics include promoting academic language development, including vocabulary development; promoting comprehension and analysis of literacy and informational texts; and developing the reading-writing connection. Extensive field experience required.

EEC 523. Methods of Reading Assessment, Instruction, & Intervention. 3 Hours.
This course will address the use of formal and informal assessment procedures used to design and evaluate robust reading instruction and intervention for children in preschool through high school. The focus of the course includes the knowledge and skills needed to choose and administer appropriate reading assessments for a variety of purposes, data-based decision making to guide instructional planning and intervention design, and understanding struggling readers, including those with reading disabilities. Instruction will be delivered within a context of an ecological, collaborative, problem solving model. Students will be guided to apply both formal and informal assessment in a problem-solving model aimed at the design of robust reading instruction. An emphasis will be placed on creating multi-tiered systems of support (MTSS) for increasing reading achievement among all students. Extensive field experience required. Admission to TEP required.

EEC 540. Advanced Workshop in Education: Methods to Support English Learners. 3 Hours.
Strengthen proficiency in teaching English Learners in the mainstream classroom. Develop understanding of second language acquisition, culturally responsive teaching, accommodations for varying language levels, and appropriate assessments for English Learners. Practice planning, implementing, and managing sheltered instruction. Extensive field experience required. Admission to TEP required.

EEC 593. Individual Readings. 1-3 Hour.
Individualized readings on special topics.

EEC 594. Field Work in Education. 1 Hour.
Observation and teaching experiences with children. Admission to TEP required.

EEC 600. Transition into P-6 Teaching. 3 Hours.
Introduction to the teaching profession (Alternative Master's Program, Elementary/Early Childhood Education).

EEC 610. Curriculum Development in Teaching. 3 Hours.
Curriculum decisions, planning and implementation.

EEC 612. Models of Teaching. 3 Hours.
Developing knowledge of curriculum and instruction. Selecting and applying specific teaching strategies. Field experience required.

EEC 615. Collaborative Learning Spaces - Designing and Developing. 3 Hours.
Introduction to the maker movement in P-6 STEM education. Explorations of the history of the maker movement in K-12 education, collaborative learning spaces, interdisciplinary connections, maker projects, curriculum, instructional strategies, assessment tools, and learning theories that support student-driven projects.

EEC 617. Engineering for P-6 Students. 3 Hours.
Introduction and exploration of the different fields of engineering, concepts, and content related to each field, engineering design process, and practices, the Next Generation Science Standards, curricular materials and resources, the latest research on engineering in P-12 schools, and assessments necessary to design and develop research-based interdisciplinary curricula for students in grades P-6.

EEC 620. Teaching Mathematics K-6. 3 Hours.
Issues and approaches in early childhood and elementary mathematics; research and implementation for instruction.
Prerequisites: EEC 660 [Min Grade: C]

EEC 621. Teaching Language Arts P-12. 3 Hours.
Issues and approaches in teaching early childhood and elementary school language arts. Implications of research for instruction.

EEC 625. Critical Pedagogy Advocacy Collaboration. 3 Hours.
Encompasses current issues in education from critical, postmodern, and feminist perspectives. Issues of advocacy, collaboration, equity, social justice, racism, sexism, and the marginalization of minorities in education will be explored.

EEC 626. Mathematics Coaching Grades K-2. 3 Hours.
Provides content knowledge and pedagogical strategies to empower instructional coaches to improve classroom teacher and instructional coach effectiveness and student achievement in mathematics. Includes authentic assessments requiring utilization of of data and current research to provide intervention to effectively respond to mathematics difficulties. Includes facilitating coaching cycles with initial certification candidates and mentoring novice teachers.

EEC 627. Mathematics Coaching Grades 3-5. 3 Hours.
Content knowledge and pedagogical strategies to empower instructional coaches to improve classroom instruction and student achievement in mathematics. Includes authentic assessment requiring utilization of data and current research to provide intervention to effectively respond to mathematics difficulties. Includes facilitating coaching cycles with colleagues and novice educators.

EEC 633. Classroom Applications of Constructivist Theory. 3 Hours.
This course provides practical classroom applications of constructivist principles in teaching and learning.

EEC 650. Systematic Reflections About Teaching. 3 Hours.
Theory and practice of reflective inquiry in the elementary classroom which includes observations, data collection, analysis, and narrative reporting.Prerequisite: Admission into Graduate School.

EEC 660. Reading in Teaching and Learning. 3 Hours.
Introductory course is designed to assist the student in locating, analyzing, and synthesizing current research in early childhood and elementary education.

EEC 670. Studying the Child in School. 3 Hours.
Analysis of child study in school; values and limitations of assessment. Extensive field experience required.

EEC 671. Creative and Affective Experiences. 1 Hour.
Nature and nurture of creativity through creative learning experiences. Maintaining and preserving creative expression throughout curriculum.

EEC 672. Piaget and Perspectives in Learning. 3 Hours.
Piaget's theory of intellectual or cognitive development; applications to elementary and early childhood education. Field experience required.

EEC 673. Teaching in Diverse Society. 3 Hours.
Examination of effective strategies for working with diverse populations.

EEC 674. Language Development. 3 Hours.
Developmental processes involved in language, relationship to education programs. Field experience required.

EEC 675. Teaching in the Urban School. 3 Hours.
Methods and materials; evaluation of school and school-related programs for equalizing educational opportunity.

EEC 677. Readinesss for Learning. 3 Hours.
Preschool and primary level language development and literacy development; assessment techniques. Field experience required.

EEC 690. Internship in P-3/3-6. 6 Hours.
Supervised teaching in an early childhood (P–3) and/or an elementary (3–6) program. The student gradually assumes responsibility for planning and teaching for the entire class (minimum of 15 weeks). The internship experience includes supervision in working with professional resource professionals and parents. Approval of application for Internship in P–3/3–6 required. All program courses must be completed.
Prerequisites: EDR 540 [Min Grade: C] and EEC 502 [Min Grade: C] and EEC 540 [Min Grade: C] and EEC 506 [Min Grade: C] and EEC 512 [Min Grade: C] and EEC 513 [Min Grade: C] and EDR 543 [Min Grade: C] and EEC 514 [Min Grade: C]

EEC 691. Practicum in ECE/ELEM. 1 Hour.
Practicum in Early Childhood Education and Elementary Education.
Prerequisites: EPR 594 [Min Grade: C](Can be taken Concurrently)

EEC 692. Curriculum Projects. 1-6 Hour.
Field projects in curriculum modifications and improvement of classroom practice.

EEC 693. Independent Studies. 1-3 Hour.
Independent Study in Elementary and Early Childhood Education.

EEC 694. Field Study. 1-6 Hour.
Field study.

EEC 695. Practicum Supervision in ECE/ELE. 2-6 Hours.
Supervision of practicum students.

EEC 696. Internship Seminar. 1-3 Hour.
Course will accompany the 9 semester hour internship (EEC 690) to support and extend the efforts of student teaching. The course will focus on problem-solving related to classroom situations such as classroom management, grading, professionalism and ethics, legal issues, teacher rights, and others that occur during the internship.

EEC 702. Administration and Supervision Prog Young Children. 3 Hours.
Evaluation, decision making, supportive services, staff development, community interaction strategies.

English as a Second Language

UAB's graduate degree program in English as a Second Language (ESL) is fully online. This program offers a Master of Arts in Education (M.A.Ed.) degree and an Educational Specialist (Ed.S.) degree. It also offers two Graduate Certificates from UAB's Graduate School. All of these degrees and certificates embody a three-fold purpose. The first purpose is to train educators in meeting the needs of a growing population of English learners of all ages (from preschool through adult) in Alabama, across the U.S., and abroad. Its second purpose is to deliver cutting-edge instruction through a standards-based, inquiry-focused approach. Its third purpose is to ensure that quality ESL graduate degrees are available to teachers everywhere by offering online courses.

The ESL master's degree program has three tracks. The traditional track is for teachers who are already-certified at the bachelor's level and wish to earn a master's degree in ESL and Class A certification for teaching ESL to K-12 learners, issued by the Alabama State Department of Education (ALSDE). The alternative track is for prospective teachers who wish to enter the K-12 teaching profession by earning Alternative Class A certification in ESL from the ALSDE. The TESOL track (non-certification) is to prepare prospective teachers for teaching ESL to adult learners in the U.S. and learners of any age overseas. Additionally, the traditional and alternative tracks offer options for earning dual certification (from the ALSDE) in ESL and French, as well as in ESL and Spanish.

The EdS-TESOL program has two tracks. The certification track is for Alabama teachers who hold Class A certification in any teaching field and wish to earn an EdS-TESOL with Class AA certification in ESL from the ALSDE. The professional track is for ESL teachers from other states as well as ESL teachers of adult learners; it does not lead to K-12 certification from the ALSDE. The EdS-TESOL infuses an inquiry-focused approach that prepares teachers for assuming leadership roles in curriculum development and instructional delivery. It provides experienced teachers with collaborative skills to serve as reflective practitioners in guiding school change as well as with mentoring techniques to positively impact student achievement and school improvement.

UAB offers the Teaching Multilingual Learners (TML) graduate certificate and the Teaching English as an Additional Language (TEAL) graduate certificate. The TML certificate consists of 12 graduate credit hours and focuses mainly on teaching ESL to P-12 learners. The TEAL graduate certificate consists of 15 graduate credit hours and focuses fully on teaching ESL to adult learners. Both certificates can be earned while pursuing an ESL master's degree or the EdS-TESOL. The TEAL certificate can also be combined with another 15-hour certificate at UAB for earning the Interdisciplinary Graduate Master's degree.

Prospective students should contact the Program Director, Dr. Josephine Prado, at jprado@uab.edu (205-975-5045).

For detailed information regarding admission requirements for the School of Education and Human Sciences graduate programs, please visit the Admissions Requirements website at https://www.uab.edu/education/studentservices/admission-requirements.

Master of Arts in Education in English as a Second Language Fifth Year Alternative Master's Program

The M.A.Ed in English as a Second Language degree for the fifth year alternative program requires a minimum of 43 hours for the concentration in ESL and 55 hours for the concentrations in ESL/Spanish and ESL/French. To successfully complete the program, the minimum required GPA is 3.25.

Requirements		Hours
EESL 530	Methods and Materials of Teaching ESL	3
EESL 512	Curriculum, Program, Policies	3
EHS 556	Classroom Mgt in Sec Schools	3
EESL 560	Effective Teaching and Learning	3
ECY 600	Introduction to Exceptional Learner [1]	3
EESL 510	Second Language Acquisition	3
EESL 513	Teaching ESL in a Multicultural Society [2]	3
EESL 515	Grammar and Linguistics for ESL Teachers	3
EESL 525	Phonology for Second Language Teachers	3
EESL 589	Internship Seminar in ESL	1
EESL 590	Internship in Second and Foreign Languages, N-12	6
EPR 510	Measurement and Evaluation in Education ECE	3
or EPR 511	Measurement and Evaluation in Education Secondary Ed	
EESL 540	Teaching New Languages Through Reading and Writing	3
Total Hours		**40**

[1] ECY 600 required if a survey of special education course not completed previously
[2] Diversity standards met in EESL 513

ESL Concentration

Requirements	Hours
advisor-approved ESL elective 500+ level	3
Total Hours	**3**

French and ESL Concentration

Requirements		Hours
EFL 539	Methods I: World Languages	3
Advisor-approved 500+ level courses in French		12
Total Hours		**15**

Spanish and ESL Concentration

Requirements		Hours
EFL 539	Methods I: World Languages	3
Advisor-approved 500+ level courses in Spanish		12
Total Hours		**15**

Master of Arts in Education in English as a Second Language Traditional Master's Program

The M.A.Ed in English as a Second Language degree for the traditional program requires a minimum of 30 hours for the concentration in ESL and 42 hours for the concentrations in ESL/Spanish and ESL/French. To successfully complete the program, the minimum required GPA is 3.25.

Requirements		Hours
EESL 610	Second Language Acquisition	3
EESL 612	Curriculum, Programs and Policies	3
EESL 613	Teaching ESL in a Multicultural Society [1]	3
EESL 615	Grammar and Linguistics for ESL Teachers	3
EESL 625	Phonology for Second Language Teachers	3
ECY 600	Introduction to Exceptional Learner [2]	3
EESL 630	Methods and Materials of Teaching ESL	3
EESL 640	Teaching New Languages Through Reading and Writing	3
EESL 660	Effective Teaching and Learning	3
EESL 690	Internship in Second and Foreign Languages, P-12	3
Total Hours		**30**

[1] Diversity standards met in EESL 613

[2] ECY 600 required if survey of special education course not completed previously

ESL Concentration

Requirements	Hours
advisor-approved education course 500+	3
Total Hours	**3**

French and ESL Concentration

Requirements		Hours
EFL 611	Advanced Methods: World Languages	3
Advisor-approved 500+ level courses in French		12
Total Hours		**15**

Spanish and ESL Concentration

Requirements		Hours
EFL 611	Advanced Methods: World Languages	3
Advisor-approved 500+ level courses in Spanish		12
Total Hours		**15**

Master of Arts in Education in English as a Second Language Non-Certification TESOL Track

The M.A.Ed in English as a Second Language degree requires a minimum of 33 hours for the non-certification concentration in TESOL. To successfully complete the program, the minimum required GPA is 3.00.

Requirements		Hours
Language Development		
EESL 610	Second Language Acquisition	3
EESL 627	Teaching Adult Language Learners [1]	3
Linguistics		
EESL 615	Grammar and Linguistics for ESL Teachers	3
EESL 625	Phonology for Second Language Teachers [1]	3
Pedagogy		
EESL 637	Methods Teaching English as an International Language [1]	3
or EESL 630	Methods and Materials of Teaching ESL	
EESL 647	Instruction and Assessment: Reading and Writing	3
or EESL 640	Teaching New Languages Through Reading and Writing	
EESL 657	Instruction and Assessment: Listening and Speaking	3
EESL 687	English for Specific Purposes [1]	3
Diversity		
EESL 617	Teaching English in a Global Context	3
or EESL 613	Teaching ESL in a Multicultural Society	
Clinical Experiences		**6-9**
EESL 007	Community English Teaching [1]	0
EESL 677	Field Studies [1]	1-3
EESL 697	ESL Practium	1-3
EESL 698	Teaching Apprenticeship	2-3
Total Hours		**33-36**

[1] UAB's Graduate Certificate Courses (15 credit hours): "Teaching English as an Additional Language"

UAB offers an Educational Specialist degree in Teaching English to Speakers of Other Languages (TESOL). As a post-MA degree, this EdS-TESOL provides advanced training in the teaching and learning of English as a Second Language (ESL) and English as a Foreign Language (EFL). Targeted for educators who already hold a master's degree in TESOL or a related area, this program equips TESOL educators with state-of-the-art instructional strategies for meeting the evolving needs of linguistically and culturally diverse learners, with collaborative skills for serving as reflective practitioners to guide change, and with mentoring techniques for positively influencing student achievement and institutional improvement. This EdS-TESOL prepares educators to assume mentorship and leadership roles to guide other educators in meeting the English-learning needs of their students in P-12 and adult settings. To that end, it prepares educators to become dynamic leaders and effective change agents by developing their capacity to serve as lead teachers, division heads, instructional coaches, professional development facilitators, and program specialists.

The EdS-TESOL has two tracks. The certification track is for Alabama teachers who hold Class A certification in any teaching field from the Alabama State Department of Education (ALSDE) and who wish to earn Class AA certification in ESL. The professional track does not lead to

K-12 certification from the ALSDE; it is for ESL teachers in other states and also for ESL teachers of adult learners.

At UAB, this EdS-TESOL degree is classified by the National Center for Education Statistics (NCES) with code 13.1401 *Teaching English as a Second or Foreign Language*. In the NCES Classification of Instructional Programs (CIP), this code defines programs that "focus on the principles and practice of teaching English to students who are not proficient in English or who do not speak, read or write English, and that may prepare individuals to function as teachers and administrators in such programs." Within this code, UAB's EdS-TESOL program is unique in how it offers two distinct tracks - the certification track and the non-certification track.

Educational Specialist (EdS) in TESOL (Certification)

This track leads to Class AA certification in ESOL issued by ALSDE. Students who hold Class A certification in ESOL complete 30 hours which must include EESL 647, EESL 657, EESL680, and EESL 687. Students who hold Class A in another teaching field complete 36 hours which must include EESL 610, 612, 613, 615, 625, 630, 640, 680, and 690. For Class AA certification in ESOL, the minimum required program GPA is 3.50.

Requirements		Hours
ECY 600	Introduction to Exceptional Learner [1]	
Track 1 (candidates w/Class A in non-ESOL teaching field)		**12-15**
Requirements		
EESL 610	Second Language Acquisition (if not already taken)	
EESL 612	Curriculum, Programs and Policies	
EESL 615	Grammar and Linguistics for ESL Teachers	
EESL 625	Phonology for Second Language Teachers	
EESL 640	Teaching New Languages Through Reading and Writing	
(EESL 647 if EESL 640 was used towards an earlier degree)		
Track 2 (candidates with Class A in ESOL)		**12**
Requirements		
EESL 647	Instruction and Assessment: Reading and Writing	
EESL 657	Instruction and Assessment: Listening and Speaking	
Two advisor-approved ESL electives from among the following courses		
EESL 617	Teaching English in a Global Context	
EESL 627	Teaching Adult Language Learners	
EESL 637	Methods Teaching English as an International Language	
Advisor-approved courses in ESL or related to ESL (3-6 hours)		
National Board Certification in English as New Language by enrolling in EESL 681 and EESL 677 (6 hrs)		
EESL 681 & EESL 677	National Boards in English as a New Language and Field Studies (National Board Certification in English as New Language)	
Diversity		**3**
EDC 732	Culturally and Linguistically Responsive Instruction [2]	
Additional Courses		
Track 1 (candidates w/Class A in non-ESOL teaching field)		6
EESL 630	Methods and Materials of Teaching ESL (EESL 637 if EESL 630 was used towards earlier degree.)	
EESL 690	Internship in Second and Foreign Languages, P-12 (The internship will be teaching ESOL and divided between early childhood/elementary and middle/secondary.)	
Track 2 (for candidates with Class A in ESOL)		3
EESL 687	English for Specific Purposes	
Elective		**3**
Choose one of the following:		
EESL 613	Teaching ESL in a Multicultural Society	
EESL 641	Teaching Emergent Bilingual Learners in the Early Childhood Setting	
EESL 670	Engaging Families and Communities	
EDC 695	Coaching for Effective Instruction	
EPR 608	Introduction to Statistical Methods in Educational Research	
Any Approved 600-level EESL course		
Research		**6**
EPR 594	Introduction to Educational Research Design	
EPR 596	Introduction to Qualitative Methods in Educational Research (Capstone)	
Capstone		**3**
EESL 680	Research in ESL	
Total Hours		**30-36**

1 Required if not previously completed.
2 Approved diversity course

Educational Specialist (EdS) in TESOL (Professional Track)

*This track does **not** leads to Class AA certification in ESOL issued by ALSDE. 30-37 Credit hours.*

Requirements		Hours
EESL 610	Second Language Acquisition [1]	3
EESL 697	ESL Practium	1-3
Advisor-Approved Teaching Field Course		**12**
EESL 612	Curriculum, Programs and Policies	
EESL 615	Grammar and Linguistics for ESL Teachers	
EESL 620	Special Topics in ESL	
EESL 625	Phonology for Second Language Teachers	
EESL 627	Teaching Adult Language Learners	
EESL 630	Methods and Materials of Teaching ESL	
EESL 637	Methods Teaching English as an International Language	
EESL 640	Teaching New Languages Through Reading and Writing	
EESL 641	Teaching Emergent Bilingual Learners in the Early Childhood Setting	
EESL 643	Promoting Global Peace through TESOL	
EESL 647	Instruction and Assessment: Reading and Writing	
EESL 657	Instruction and Assessment: Listening and Speaking	
EESL 660	Effective Teaching and Learning	
EESL 670	Engaging Families and Communities	
EESL 687	English for Specific Purposes	
EESL 681	National Boards in English as a New Language	
Any Approved 600-level EESL course		
Diversity Course		**3**
EESL 613	Teaching ESL in a Multicultural Society	
EESL 617	Teaching English in a Global Context	
EDC 732	Culturally and Linguistically Responsive Instruction	
EPR 594	Introduction to Educational Research Design	3
Another Research Course		**3**
EESL 680	Research in ESL	

EPR 596	Introduction to Qualitative Methods in Educational Research	
EPR 608	Introduction to Statistical Methods in Educational Research	
Advisor-Approved Education Courses		**9**
EDC 695	Coaching for Effective Instruction	
EDC 707	Introduction to Teacher Leadership	
EDC 711	Analysis and Evaluation of Teaching	
EESL 677	Field Studies	
Any Approved 600-level EESL course		
Total Hours		**34-36**

[1] Required if not previously taken.

UAB offers the Teaching Multilingual Learners (TML) graduate certificate and the Teaching English as an Additional Language (TEAL) graduate certificate. Both certificates can be earned while pursuing an ESL master's degree or the EdS-TESOL.

The TEAL graduate certificate consists of 15 graduate credit hours and focuses fully on teaching ESL to adult learners. The TEAL Certificate is an AL-ASSET (Alabama Advanced Specialized Skills, Education, and Training). Its designation indicates approval from the Alabama Council of Graduate Deans to align with the statewide initiative to meet workforce development needs. The TEAL certificate can be combined with another UAB graduate certificate or it can be transferred between UA system campuses and other participating institutions in Alabama to stack into an interdisciplinary master's degree.

The TML certificate consists of 12 graduate credit hours and focuses mainly on teaching ESL to P-12 learners.

Graduate Certificate in Teaching English as an Additional Language

Requirements		Hours
EESL 625	Phonology for Second Language Teachers	3
EESL 627	Teaching Adult Language Learners	3
EESL 637	Methods Teaching English as an International Language	3
EESL 687	English for Specific Purposes	3
EESL 677	Field Studies	3
EESL 007	Community English Teaching	0
Total Hours		**15**

Graduate Certificate in Teaching Multilingual Learners

Requirements		Hours
EESL 510	Second Language Acquisition	3
or EESL 610	Second Language Acquisition	
Advisor Approved Electives		**9**
Select 9 credits of Electives from EESL 512:697 for approval		
Total Hours		**12**

Courses

EESL 510. Second Language Acquisition. 3 Hours.
An in-depth look at major theories of second language acquisition. Exploration of learning environments, programs, home language, culture, and other factors that influence second language acquisition. This course entails 30 hours of field experiences. Required for the Alternative Master's.

EESL 512. Curriculum, Program, Policies. 3 Hours.
Introduction to the curriculum, programs, policies, and laws that support new language learners with respect to legal issues, instructional strategies, accommodations, assessments, and support networks and that are grounded in second language acquisition theory. This course entails 5 days of field experiences in an English learner summer program. Required for the Alternative Master's in ESL.

EESL 513. Teaching ESL in a Multicultural Society. 3 Hours.
Designed to introduce students to the goals, principles, and practices of multicultural education and to sensitize students to cultural pluralism in the United States. Required for the Alternative Master's.

EESL 515. Grammar and Linguistics for ESL Teachers. 3 Hours.
A critical study of aspects of Modern English grammar and linguistics that are important for the teaching of English as a Second or Foreign Language. Students will gain an understanding of the major syntactic and semantic phenomena important for teaching ESL/EFL, become familiar with the practical and theoretical literature on teaching English grammar, participate in practical exercises, and develop instructional activities that embed grammar skills into content-driven lessons. Required for the Alternative Master's.

EESL 525. Phonology for Second Language Teachers. 3 Hours.
An introduction to phonology and its application to the teaching of a second or foreign language. Students learn the phonological structure of the English language, analyze examples from language learner data, diagnose pronunciation difficulties experienced by language learners from different first languages, and identify instructional strategies for assisting language learners to perceive and produce challenging sounds. Required for the Alternative Master's.

EESL 530. Methods and Materials of Teaching ESL. 3 Hours.
Examines traditional and current approaches for teaching English to speakers of other languages and curriculum materials, texts, and other resources. This course entails 30 hours of field experiences. Required for the Alternative Master's.

EESL 540. Teaching New Languages Through Reading and Writing. 3 Hours.
Theory, research and practice in reading and writing for second language learners. Implications for teaching reading and writing skills that allow second language learners to participate in the full range of academic situations. This course entails 30 hours of field experiences. Required for the Alternative Master's.

EESL 560. Effective Teaching and Learning. 3 Hours.
This course prepares candidates to plan, teach, and assess second and foreign languages in school settings: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment. This course entails 30 hours of field experience. Required for the Alternative Master's in ESL, French, and Spanish.

EESL 570. Engaging Families and Communities. 3 Hours.
This course prepares professional educators to engage families and communities with the overarching idea of shared responsibility for the English learner's academic success. In this course, UAB candidates will determine what family engagement could look like over time and through multiple levels, starting with individual engagement, the engagement of a school, and of a school system.

EESL 589. Internship Seminar in ESL. 1 Hour.
Provides an opportunity to explore in-depth effective ways to deliver instruction during the internship experience.

EESL 590. Internship in Second and Foreign Languages, N-12. 6 Hours.
Meets the internship requirements of the state code. Interns are engaged in the full scope of teaching activities including planning and delivering lessons, evaluating students, and conducting managerial tasks and other appropriate duties.

EESL 600. TESOL Residency. 0 Hours.
Students in the EdS program’s non-certification track must enroll in EESL 008 during the summer term. During their two-week residency at UAB, they will participate in a TESOL institute on campus and also visit TESOL sites off-campus.

EESL 601L. Community English Teaching. 0-1 Hours.
Students co-teach weekly Community English Classes.

EESL 610. Second Language Acquisition. 3 Hours.
An in-depth look at major theories of second language acquisition. Exploration of learning environments, home language, culture, and other factors that influence second language acquisition. This course entails 30 hours of working with English learners in one's own educational context.

EESL 612. Curriculum, Programs and Policies. 3 Hours.
Introduction to the curriculum, programs, policies, and laws that support new language learners with respect to legal issues, support networks, instructional strategies, assessments, and accommodations and that are grounded in second language acquisition theory. This course entails 3 days of field experiences in an English learner summer program.

EESL 613. Teaching ESL in a Multicultural Society. 3 Hours.
Designed to introduce students to the goals, principles, and practices of multicultural education and to sensitize students to cultural pluralism in the United States.

EESL 615. Grammar and Linguistics for ESL Teachers. 3 Hours.
A critical study of aspects of Modern English grammar and linguistics that are important for the teaching of English as a Second or Foreign Language. Students will gain an understanding of the major syntactic and semantic phenomena important for teaching ESL/EFL, become familiar with the practical and theoretical literature on teaching English grammar, participate in practical exercises, and develop instructional activities that embed grammar skills into content-driven lessons.

EESL 617. Teaching English in a Global Context. 3 Hours.
Provides a sociolinguistic perspective on the globalization of English and on the emergence and teaching of English as an International Language. Students explore dialectology, language change, language diversity, language ideology and power, national language policies, World Englishes, the growing number of non-native English speakers, and attitudes of native and non-native English speakers toward the domination of English.

EESL 620. Special Topics in ESL. 3 Hours.
Topics will vary from year to year.

EESL 625. Phonology for Second Language Teachers. 3 Hours.
An introduction to phonology and its application to the teaching of a second or foreign language. Students learn the phonological structure of the English language, analyze examples from language learner data, diagnose pronunciation difficulties experienced by language learners from different first languages, and identify instructional strategies for assisting language learners to perceive and produce challenging sounds.

EESL 627. Teaching Adult Language Learners. 3 Hours.
Introduces goals, principles, and practices for teaching English to adult learners, addresses the influence of varying backgrounds on adult language learning, and examines ways to evaluate adults' second language development. After learning to recognize quality components in distinct program models, as outlined by TESOL Standards for Adult Education ESL Programs, students do a critical study of community-based or other English language programs.

EESL 630. Methods and Materials of Teaching ESL. 3 Hours.
Examines traditional and current approaches to teaching English to speakers of other languages and curriculum materials, texts, and other resources, specifically within PK-12 settings. This course entails 40 hours of field experience working with English learners in one's own school.

EESL 637. Methods Teaching English as an International Language. 3 Hours.
Prepares students to teach English as an International Language by using methods, strategies, and techniques appropriate for adults in ESL contexts and for all learners in EFL contexts both for in-person and online instruction. Engaged with approaches aligned with TESOL Standards for ESL/EFL Teachers of Adults, students review language learning needs for 5 program settings: adult/community, workplace, college/university, intensive English, and English as a Foreign Language. During the semester, students design and implement a curriculum for instruction and assessment of language learning outcomes. This course entails 30 hours of field experiences.

EESL 640. Teaching New Languages Through Reading and Writing. 3 Hours.
Theory, research and practice in reading and writing for second language learners. Implications for teaching reading and writing skills that allow second language learners to participate in the full range of academic situations. This course entails 8 hours of field experiences at another school and 32 hours working with English learners in one's own school.

EESL 641. Teaching Emergent Bilingual Learners in the Early Childhood Setting. 3 Hours.
This course prepares candidates to work effectively with emergent bilingual learners in the early childhood setting. Candidates will gain context knowledge needed to design curriculum, including literacy, appropriate for emergent bilingual learners and will learn how culture and home language impacts learning additional languages.

EESL 643. Promoting Global Peace through TESOL. 3 Hours.
This course guides graduate students in understanding and facilitating the promotion of global peace within and out of the TESOL classroom through listening, speaking, reading and writing. The goal of this course is for educators to learn to use the tools of negotiation, arbitration, and mediation with an overarching focus on peacekeeping, peacemaking, and peacebuilding.

EESL 647. Instruction and Assessment: Reading and Writing. 3 Hours.
Addresses linguistic, sociocultural, psychological, and educational factors that affect literacy development of English as an additional language. Grounded in theoretical and practical aspects of teaching second language (L2) reading and writing to adolescents and adults in diverse communities, students learn to implement effective instructional strategies for promoting literacy in English as an additional language. To measure attainment of L2 reading and writing skills, students learn to design and conduct authentic assessments and to administer standardized assessments. This course entails 30 hours of field experiences.

EESL 650. Strategies for Teaching Math and Science to ELLs. 3 Hours.
Provides knowledge and strategies for making math and science accessible to ELLs at all grade levels, K-12. Classroom teachers will learn to make accommodations for teaching ELLs within a sheltered instruction framework.

EESL 657. Instruction and Assessment: Listening and Speaking. 3 Hours.
Examines how spoken communication is structured so that it is socially appropriate and linguistically accurate. Students learn principles and best practices for the contextualized teaching of second language (L2) listening and speaking skills to adolescent and adult learners. After exploring the purposes, types, and availability of formal testing tools to assess the attainment of these skills in English as an additional language, students also learn to generate and conduct their own tests for assessing L2 listening and speaking. This course entails 30 hours of field experiences.

EESL 660. Effective Teaching and Learning. 3 Hours.
This course prepares candidates to plan teach and assess second and foreign languages in school settings: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment. This course entails 30 hours of field experience. Required for the traditional Master's in ESL.

EESL 670. Engaging Families and Communities. 3 Hours.
This course prepares professional educators to engage families and communities with the overarching idea of shared responsibility for the English learner's academic success. In this course, UAB candidates will determine what family engagement could look like over time (in school years) and through multiple levels, starting with individual engagement, the engagement of a school, and of a school system.

EESL 677. Field Studies. 1-3 Hour.
Students participate in field studies related to the teaching of English as a second or foreign language.

EESL 680. Research in ESL. 3 Hours.
Primary types of research conducted in second language teaching and learning and how these methods can be used to inform teaching. Introduction to classroom-based second language research approaches.

EESL 681. National Boards in English as a New Language. 3 Hours.
This course prepares experienced teachers for National Board Candidacy in English as a New Language (ENL). Students enrolled in this course may be either pre-candidates or candidates for National Board Certification.

EESL 687. English for Specific Purposes. 3 Hours.
This inquiry-focused course guides emerging teachers in experiencing the differentiated facets of working in adult ESL and EFL environments. Students explore English for Specific Purposes and related issues in Intensive English Programs, English for Occupational Purposes, Program Administration, and English as an International Language. Students observe classes in regional IEPs, develop an EOP program, receive hands-on experience in administration, apply research to various adult EIL teaching situations, and do an in-depth study of an EFL context.

EESL 689. Seminar in ESL. 1 Hour.
Provides an opportunity to explore in-depth effective ways to deliver instruction during the internship experience. Must be taken concurrently with EESL 690.
Prerequisites: EESL 610 [Min Grade: C]

EESL 690. Internship in Second and Foreign Languages, P-12. 3 Hours.
Meets the internship requirements of the state code. Interns are engaged in the full scope of teaching activities including planning and delivering lessons, evaluating students, and conducting managerial tasks and other appropriate duties. This course entails 2 weeks of internship in an English learner summer program. Approval of internship application for the traditional master's.

EESL 697. ESL Practium. 1-3 Hour.
In this practicum course, prospective ESL/EFL teachers shadow a professional ESL teacher when teaching an Academic English class. As needed, they also provide specialized support for the ESL students in that class. To enhance their professional growth, these prospective teachers share their reflections and newly-acquired competencies with the EESL 697 course instructor.

EESL 698. Teaching Apprenticeship. 2-3 Hours.
This required teaching apprenticeship is housed in a standards-based course that offers practical application of the knowledge and skills learned in other courses for teaching ESL. After having completed one semester of structured observations of professional ESL educators and participated in corresponding debriefings, novice teachers engage in the full scope of ESL teaching activities. They plan and deliver lessons, assess learners and their language development, and conduct managerial tasks and other appropriate duties.
Prerequisites: EESL 697 [Min Grade: C]

EESL 717. Teaching English in Global Context. 3 Hours.
This course provides a sociolinguistic perspective on the globalization of English and on the emergence and teaching of English as an International Language. Students explore dialectology, language change, language diversity, language ideology and power, national language policies, World Englishes, the growing number of non-native English speakers, and attitudes of native and non-native English speakers toward the domination of English.

EESL 737. Teaching English as an International Language. 3 Hours.
The primary purpose of this course is to guide educators in exploring the teaching of English as a second, new, or foreign language to English learners of all ages. With the goal of expanding an educator's repertoire for teaching speakers of languages other than English, this course considers the relevance of historical approaches and methods used in language teaching during the past century and reviews language methods and approaches used in today's ESL and EFL classrooms. Educators analyze selected methods and approaches in differing contexts that include English as a Second Language (ESL), English as a Foreign Language (EFL), and English as an International Language (EIL) or English as Lingua Franca (ELF).

EESL 743. Promoting Global Peace through TESOL. 3 Hours.
This course guides doctoral students in understanding and facilitating the promotion of global peace within their classroom and educational setting as well as in other settings, both locally and globally.

EESL 747. Instruction and Assessment: Reading and Writing. 3 Hours.
This course explores the linguistic, sociocultural, psychological, and educational factors that affect literacy development in English as a second or foreign language (ESL/EFL). Educators will analyze literacy-learning needs of English learners (ELs) in diverse contexts and multiple age groups and will participate in effective and engaging ways to meet those needs.

EESL 757. Instruction and Assessment: Listening and Speaking. 3 Hours.
Based on linguistic perspectives and language acquisition research from earlier in their careers, educators will use research, experience, and reflection to further inform their own teaching practice in TESOL. To that end, they will explore the complexities of linguistic, sociocultural, psychological, and educational factors that affect ELLs' aural and oral development.

EESL 763. Facilitating Intercultural Communicative Competence. 3 Hours.
This course guides doctoral students in understanding and facilitating their students' intercultural communicative competence within and out of the classroom.

EESL 780. Research in ESL/EFL. 3 Hours.
Exploration of research methods conducted in second and foreign language teaching and applications of these methods to inform teaching in the ESL and/or EFL contexts.

Secondary Education

UAB's Secondary Education program prepares pre-service and in-service teachers for teaching in both Middle School and High School. This secondary education program offers the following graduate degrees: Master of Arts in Education (MAEd) and Educational Specialist (EdS).

UAB's Secondary Education program embodies a three-fold purpose. Its first purpose is to prepare educators in meeting the evolving needs of learners, primarily in grades 6-12, within today's rapidly changing society. Based on constructivism, its second purpose is to deliver instruction through a standards-based, inquiry-focused approach that prepares educators to use effective instructional strategies in their own classrooms. Its third purpose is to ensure that a quality program is available to pre-service and in-service teachers who may be unable to attend class during traditional class hours. This program is unique in how it combines online support from Canvas with a variety of delivery formats:

- blended courses (online & face-to-face evenings)
- professional learning communities
- flexible summer programming
- totally online platform

These purposes are expanded and enhanced by the EdS program. This advanced degree offers standards-based concentrations within discipline areas. It infuses an inquiry-focused teacher leader approach that prepares teachers for assuming leadership roles in curriculum development and instructional delivery. It also provides experienced teachers with collaborative skills to serve as reflective practitioners in guiding school change as well as with mentoring techniques to positively impact student achievement and school improvement.

Prospective students should contact the Program Director, Paulette Evans at pgevans@uab.edu (205-975-7519).

For detailed information regarding admission requirements for the School of Education and Human Sciences graduate programs, please visit the Admissions Requirements website at https://www.uab.edu/education/studentservices/admission-requirements.

Master of Arts in Education in Secondary Education Traditional Master's Program

The M.A.Ed. degree requires a minimum of 33 credit hours for the Secondary Education program with concentrations in Biology, Chemistry, General Science, Mathematics, Physics, English Language Arts, General Social Science, and History. A minimum GPA of 3.25 is required.

Requirements		Hours
All Concentrations		
EDC 606	The Dynamics of Educational Change	3
EDC 651	Innovative Practices in Instruction	3
EDC 655	Curriculum Principles and Practices	3
EPR 594	Introduction to Educational Research Design	3
ECY 600	Introduction to Exceptional Learner [1]	3
ALSDE-approved Diversity course		**3**
EDF 600	Urban Education	
EDF 602	Critical Social Issues in American Education	
EDF 606	Social Movements in Education	
EDF 620	Culture and American Education: Race Class and Gender	
ECT 625	Positive Behavioral Supports	
Total Hours		**18**

[1] May not be required if previously completed

Concentration in Biology, 6-12

Requirements		Hours
Advisor-approved Biology courses at 500+ level		12
EHS 615	Advanced Methods: Science, Grades 6-12	3
Total Hours		**15**

Concentration in Chemistry, 6-12

Requirements		Hours
Advisor-approved Chemistry courses at 500+ level		12
EHS 615	Advanced Methods: Science, Grades 6-12	3
Total Hours		**15**

Concentration in General Science, 6-12

Requirements		Hours
Advisor-approved Science courses at 500+ level		12
EHS 615	Advanced Methods: Science, Grades 6-12	3
Total Hours		**15**

Concentration in Mathematics, 6-12

Requirements		Hours
Advisor-approved Mathematics courses at 500+ level		12
EHS 616	Advanced Methods: Mathematics, Grades 6-12	3
Total Hours		**15**

Concentration in Physics, 6-12

Requirements		Hours
Advisor-approved Physics courses at 500+ level		12
EHS 615	Advanced Methods: Science, Grades 6-12	3
Total Hours		**15**

Concentration in English Language Arts, 6-12

Requirements		Hours
Advisor-approved courses at the 500+ level in English and another ELA field		12
EHS 612	Advanced Methods: English Language Arts, Grades 6-12	3
Total Hours		**15**

Concentration in General Social Science, 6-12

Requirements		Hours
Advisor-approved courses at the 500+ level in 2 or more Social Science disciplines		12
EHS 614	Advanced Methods: Social Sciences, Grades 6-12	3
Total Hours		**15**

Concentration in History, 6-12

Requirements		Hours
Advisor-approved History courses at the 500+ level		12
EHS 614	Advanced Methods: Social Sciences, Grades 6-12	3
Total Hours		**15**

Master of Art in Education in Secondary Education Fifth Year Alternative Master's Program

The Alternative M.A.Ed. degree requires 37-40 credit hours for the Fifth Year Alternative Master's program in Secondary Education with concentrations in Biology, Chemistry, General Science, Mathematics, Physics, English Language Arts, General Social Science, and History. The Alabama State Department of Education requires a minimum GPA of 3.25 for certification.

Requirements		Hours
All Concentrations		
ECY 600	Introduction to Exceptional Learner [1]	3
EDR 551	Reading in Content Areas	3
EHS 556	Classroom Mgt in Sec Schools	3
EHS 597	Special Problems in Education: Diversity	3
EHS 690	Intern Seminar in Sec Edu	1
EHS 691	Secondary School Internship	6
EPR 511	Measurement and Evaluation in Education Secondary Ed	3
Total Hours		**22**

[1] May not be required if previously completed

Concentration in Biology, 6-12

Requirements		Hours
Advisor-approved Biology courses at the 500+ level		12
EHS 537	Methods I: Science, 6-12	3
EHS 567	Methods II: Science, 6-12	3
Total Hours		**18**

Concentration in Chemistry, 6-12

Requirements		Hours
Advisor-approved Chemistry courses at the 500+ level		12
EHS 537	Methods I: Science, 6-12	3
EHS 567	Methods II: Science, 6-12	3
Total Hours		**18**

Concentration in General Science, 6-12

Requirements		Hours
Advisor-approved 500+ level courses in two (2) Science Disciplines		12
EHS 537	Methods I: Science, 6-12	3
EHS 567	Methods II: Science, 6-12	3
Total Hours		**18**

Concentration in Mathematics, 6-12

Requirements		Hours
Advisor-approved Mathematics courses at 500+ level		12
EHS 535	Methods I Mathematics 6-12	3
EHS 565	Methods II: Mathematics, 6-12	3
Total Hours		**18**

Concentration in Physics, 6-12

Requirements		Hours
Advisor-approved Physics at 500+ level		12
EHS 537	Methods I: Science, 6-12	3
EHS 567	Methods II: Science, 6-12	3
Total Hours		**18**

Concentration in English Language Arts, 6-12

Requirements		Hours
Advisor-approved at the 500+ level in English and another ELA field		12
EHS 536	Methods I: English Language Arts, 6-12	3
EHS 566	Methods II: English Language Arts, 6-12	3
Total Hours		**18**

Concentration in General Social Science, 6-12

Requirements		Hours
Advisor-approved Courses in 2 or more 500+ level Social Science Disciplines		12
EHS 538	Methods I: Social Science, 6-12	3

EHS 568	Methods II: Social Science, 6-12	3
Total Hours		**18**

Courses

EHS 530. Practicum. 1-2 Hour.
Field experience in school-based setting. Admission to Alternative Master's Program required.
Prerequisites: EDU 500 [Min Grade: C](Can be taken Concurrently)

EHS 535. Methods I Mathematics 6-12. 3 Hours.
Introduction to teaching mathematics in secondary school settings. Developing basic skills in planning, instruction, and assessment. Supervision fee.

EHS 536. Methods I: English Language Arts, 6-12. 3 Hours.
In this course, teacher candidates will explore the essentials of teaching English Language Arts in secondary schools, emphasizing planning, instruction, and assessment, alongside field supervision. This course establishes a foundation in content pedagogical skills and a deep connection between ELA research, theory, and practice. Teacher candidates will craft relevant, rigorous, and responsive lesson plans, considering diverse needs, interests, and experiences of students. Because this course is comprehensive, teacher candidates will gain valuable field experience with 40-50+ hours of direct engagement, preparing for the dynamic challenges in English Language Arts instruction. Admission to AMP required.

EHS 537. Methods I: Science, 6-12. 3 Hours.
Introduction to teaching science in secondary school settings. Developing basic skills in planning, instruction, and assessment. Admission to Alternative Master's Program required. Field supervision fee.

EHS 538. Methods I: Social Science, 6-12. 3 Hours.
This course explores theory and best teaching practices with disciplinary literacy and inquiry-based teaching practices for the secondary social studies classroom. This course emphasizes structuring into all components of lesson planning the historical thinking, literacy, and argumentation skills used by historians to analyze historical and contemporary issues and events. Pre-service teachers will apply these best teaching practices into their field placement requirements.

EHS 556. Classroom Mgt in Sec Schools. 3 Hours.
This course places an emphasis on exploring strategies to mitigate classroom management issues in the secondary classroom. Additionally, candidates explore ways to design procedures and develop norms to create and govern an inclusive and safe secondary classroom.

EHS 565. Methods II: Mathematics, 6-12. 3 Hours.
Preparation to plan, teach and assess mathematics in secondary school settings: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment.
Prerequisites: EHS 535 [Min Grade: C]

EHS 566. Methods II: English Language Arts, 6-12. 3 Hours.
In this course, teacher candidates will explore the essentials of teaching English Language Arts in secondary schools, emphasizing planning, instruction, and assessment, alongside field supervision. This course goes beyond basics, focusing on developing content pedagogical skills and a deep connection between ELA research, theory, and practice. Teacher candidates will hone in on the arts and sciences of instruction and designing effective and equitable assessments that include the diverse needs, interests, and experiences of students. Because this course is comprehensive, students will continue growing in their field experience with 50-60+ hours of direct engagement, preparing for the dynamic challenges in English Language Arts instruction.
Prerequisites: EHS 536 [Min Grade: C]

EHS 567. Methods II: Science, 6-12. 3 Hours.
Preparation to plan, teach and assess science in secondary school settings: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment.
Prerequisites: EHS 537 [Min Grade: C]

EHS 568. Methods II: Social Science, 6-12. 3 Hours.
This course focuses on theory and best teaching practices with disciplinary thinking skills and inquiry-based teaching practices for the secondary social studies classroom. This course stresses structuring into all components of lesson planning the civic thinking, literacy, and argumentation skills employed by political scientists to analyze historical and contemporary issues and events. Pre-service teachers will apply these best teaching practices into their field placement requirements.
Prerequisites: EHS 538 [Min Grade: C]

EHS 570. Practicum II. 1 Hour.
Field experience in school-based setting.

EHS 597. Special Problems in Education: Diversity. 3 Hours.
Seminar for graduate students; readings and research projects based on special interests. May be repeated for total of 6 hours. Field Supervision Fee.

EHS 600. Secondary Education Curriculum and Methods I. 3 Hours.
Introductory course in Alternative Masters Program for secondary school education. Developing basic teaching skills and understanding of interdependence among all levels within school and community. Course requires 40 hours of field experiences beyond class meetings.

EHS 612. Advanced Methods: English Language Arts, Grades 6-12. 3 Hours.
Advanced methods for teaching English language arts in grades 6-14. Includes curriculum development, classroom interaction, pedagogical activities, technology applications, source materials, current research, society issues, and cognitive development of students. Current classroom teaching required. Changed to Grades 6-12 (rather than 14) to align with secondary education grade levels.

EHS 614. Advanced Methods: Social Sciences, Grades 6-12. 3 Hours.
Advanced methods for teaching the social sciences in grades 6-14. Includes curriculum development, classroom interaction, pedagogical activities, technology applications, source materials, current research, society issues, and cognitive development of students. Current classroom teaching required.

EHS 615. Advanced Methods: Science, Grades 6-12. 3 Hours.
Advanced methods for teaching science in grades 6-14. Includes curriculum development, classroom interaction, pedagogical activities, technology applications, source materials, current research, society issues, and cognitive development of students. Current classroom teaching required.

EHS 616. Advanced Methods: Mathematics, Grades 6-12. 3 Hours.
Advanced methods for teaching mathematics in grades 6-14. Includes curriculum development, classroom interaction, pedagogical activities, technology applications, source materials, current research, society issues, and cognitive development of students. Current classroom teaching required.
Prerequisites: EHS 565 [Min Grade: C]

EHS 651. Innovative Practices in Teaching in Secondary School. 3 Hours.
Innovative practices in planning, instructing, and evaluating high school area studies. May be repeated if taken in different areas of study.

EHS 680. National Board Seminar for Secondary Education. 3 Hours.
Course involves 18 Saturday seminars during the school year to prepare teachers for National Board Candidacy and to support candidates as they go through the certification process. Students enrolled in this course may be either pre-candidates or candidates for National Board Certification.

EHS 681. Special Topics in Education. 1-6 Hour.
Prerequisite: Permission of instructor.

EHS 690. Intern Seminar in Sec Edu. 1-3 Hour.
Observation and teaching in secondary school (15 weeks minimum). Includes attendance at several seminars on campus. Unconditional acceptance in Alternative Master's Program and approval of application for internship required.

EHS 691. Secondary School Internship. 3-9 Hours.
Observation and teaching in secondary school (15 weeks minimum). Includes attendance at a weekly seminar on campus. Prerequisites: Unconditional acceptance in 5th-Year Program and approval of application for internship.

EHS 692. Field Studies (Selected Educational Settings). 1-3 Hour.
Field Studies.

EHS 693. Advanced Field Experience. 3 Hours.
Field Studies.

EHS 698. Individual Research in Education. 1-6 Hour.
Research Prerequisite: Permission of instructor.

EHS 720. Individual Research in Education. 3-6 Hours.
Research Prerequisites: Master's degree and permission of instructor.

Instructional Design & Development

The purpose of the UAB Instructional Design and Development (IDD) program is to train qualified instructional designers and learning experience designers who effectively analyze, design, develop, evaluate, and implement quality online, blended, and on-ground learning experiences. This fully-online program follows and achieves the International Board of Standards for Training, Performance and Instruction (IBSTPI) competencies and performance standards for instructional designers.

Instructional design and development is the practice of systematically creating learning experiences that make the development of knowledge and skill more efficient and effective. The process consists broadly of determining the current state and needs of the learner, defining the end goal, and creating some "intervention" to assist in the transition. The process is guided by pedagogically-tested theories of learning and may take place in many different learning environments. As a field, instructional design and development is historically and traditionally rooted in cognitive and behavioral psychology, though recently, constructivism has influenced thinking in the field.

The study of instructional design and development includes the study of learning theory and trends in educational technology, instructional design principles, universal design and usability for effective design, development, and delivery of learning experiences across a wide range of learning environments.

Master of Science in Instructional Design and Development

Requirements		Hours
IDD 600	Trends and Issues in Instructional Design	3
IDD 610	Instructional Design	3
IDD 620	Universal Differential Instructional Design and Development	3
IDD 630	Performance System Technology	3
IDD 640	Learning, Cognition, and Instructional Design and Development	3
IDD 650	Alternate Instructional Design and Develpoment Models	3
IDD 660	Assessment and Evaluation in Instructional Design & Development	3
IDD 670	Multimedia Design and Development for Instruction and Training	3
IDD 680	Instructional Design and Developement Elective	3
IDD 690	Research Practicum	3
Total Hours		**30**

IDD-Instructional Design Dev Courses

IDD 600. Trends and Issues in Instructional Design. 3 Hours.
This course defines the field of instructional design and learning design by exploring its history, current trends and future issues in the field. The course provides insights from leaders in the field, case studies on instructional design in different fields, and interactive activities on the systematic approaches to instructional design.

IDD 610. Instructional Design. 3 Hours.
Instructional Design is a project-based course that includes step-by-step strategies to create learning experiences using design models, instructional strategies, and technology applications. Learners will study the processes of analysis, design, development, implementation, and evaluation in order to apply real-world learning experience design solutions to instructional challenges.

IDD 620. Universal Differential Instructional Design and Development. 3 Hours.
This course gives students an experience in research-based learning design methods and alternative assessment strategies designed to meet the varied instructional needs and preferences of all learners in today's educational environments.

IDD 630. Performance System Technology. 3 Hours.
This course provides students with practical methods of analyzing and solving human performance problems with an emphasis on development of both non-instructional and instructional interventions. An overview of concepts and current issues related to the design and development of learning and performance systems at the macro-level is also provided, allowing learners to explore learning and performance from a broad organizational perspective.

IDD 640. Learning, Cognition, and Instructional Design and Development. 3 Hours.
This course surveys the learning sciences literature that is especially relevant for instructional designers. The course covers major theoretical perspectives in the learning sciences and has students read original empirical research. The goal is to prepare IDD students to utilize learning sciences literature in their careers.

IDD 650. Alternate Instructional Design and Development Models. 3 Hours.
This course affords students the opportunity to apply a variety of well-established and emerging learning design and development models.

IDD 660. Assessment and Evaluation in Instructional Design & Development. 3 Hours.
Students will learn how to assess human attitudes, knowledge and performance, analyze practical data, and evaluate learning and human performance programs.

IDD 670. Multimedia Design and Development for Instruction and Training. 3 Hours.
This course will present techniques for the integration of learning design theory and practice with the current and emerging delivery systems. Students will develop skills and explore software necessary to develop and produce an original interactive learning product.

IDD 680. Instructional Design and Development Elective. 3 Hours.
Content will be diversified opportunities to take advantage of specific areas of expertise of faculty, availability of experts in areas not covered in other course work, or original projects that become available.

IDD 690. Research Practicum. 1-3 Hour.
The research practicum is a supervised learning experience in an actual or similar setting to those which instructional designers, learning experience designers, and learning scientists are employed.

LDLS-Learning Dsgn Learning Sc Courses

LDLS 620. Learning Design Research Methods. 3 Hours.
This course surveys research methodologies used in the Learning Sciences and learning design, with an emphasis on design-based research. Students will collect and analyze qualitative data, conduct learning experience network analysis, and use research to drive iterative design improvements.

LDLS 630. Design Thinking for Engaged Learning. 3 Hours.
This course investigates the synergies between design thinking and learning experience design. This course emphasizes the utilization of design thinking methodologies as both a design tool and a subject of instruction to foster deep engagement and intrinsic motivation. In this course, students will explore design thinking processes and mindsets and apply them to create engaging, learner-centered learning experiences.

LDLS 680. Game-Based Learning. 3 Hours.
In this course, students will unpack the intricacies of game-based learning (GBL), differentiating it from gamification and examining its potential for identity exploration. Students will design immersive learning experiences that leverage the intrinsic motivations and affordances provided by both experiential and generative game-based learning.

LDLS 681. Learning Design With and For Augmented Intelligence. 3 Hours.
This course is a foray into the cutting-edge intersection of the Learning Sciences and artificial intelligence (AI), characterized by a framing of AI as augmented intelligence. Students will develop AI literacy and leverage AI tools for designing learning experiences and design experiences that incorporate AI, all within a framework of extended and distributed cognition.

LDLS 682. Complex Systems. 3 Hours.
This course provides a complex systems perspective on learning contexts. Students will engage with various complex systems theories, including complex dynamical systems, complex adaptive systems, and complex conceptual systems. Students will analyze learning as a complex system and design experiences that embrace this complexity.

LDLS 683. Designing for Creativity in Learning. 3 Hours.
This course investigates the nuances of creativity in learning experiences and contexts. It focuses on frameworks, evaluations, and designs to nurture creative mindsets, creative environments, creative processes, and creative cognition. Students will utilize the Creativity Landscape framework to analyze and design learning experiences that are optimized for fostering creative thinking and action.

LDLS 684. Theory Building in the Learning Sciences. 3 Hours.
This course focuses on theory-building methodologies within the Learning Sciences. It explores approaches to developing new theories and building on existing theories to advance learning design and the Learning Sciences. Students will engage with grounded theory and design-based research methodologies to contribute to the body of theoretical knowledge in the field.

LDLS 685. Frontiers in the Learning Sciences. 3 Hours.
This course explores emerging topics, paradigms, methodologies, and debates in the learning sciences through a combination of readings, discussions, and hands-on activities. The specific content evolves each year to reflect the latest research and innovations in the field.

Reading

The Reading Education master's program (M.A.Ed.) prepares teachers to serve as reading specialists and to improve their classroom skills in teaching and coaching for reading. Reading candidates will receive in-depth knowledge of reading pedagogy and implementation during their program. The reading candidates participate in extensive work with children/students in diverse groupings and settings. A portfolio of professional development in reading is completed by the end of the program.

For detailed information regarding admission requirements for the School of Education and Human Sciences graduate programs, please visit the Admissions Requirements website at https://www.uab.edu/education/studentservices/admission-requirements.

Reading Specialist Certification

The Graduate Non-Degree Reading Specialist Program requires a minimum of 36 credit hours.

Requirements		Hours
EEC 621	Teaching Language Arts P-12	3
EESL 640	Teaching New Languages Through Reading and Writing [1]	3
EDR 600	Disciplinary Literacy P-12	3
EDR 650	Teaching Reading P-12	3
EDR 653	Literature for Grades P-12	3
EDR 655	Reading Assessment and Evaluation	3
EDR 659	Research and Problems in Reading	3
ECY 600	Introduction to Exceptional Learner [2]	3
EPR 594	Introduction to Educational Research Design	3
EDR 654	Dyslexia Research, Education & Advocacy	3
EDC 695	Coaching for Effective Instruction	3
EDR 690	Internship in Reading	3
Total Hours		**36**

1 Approved diversity course
2 Not required if previously completed

Master of Arts in Education in Reading Education

The M.A.Ed. in Reading Education degree for the Reading Specialist program requires a minimum of 36 hours. A minimum GPA of 3.25 is required.

Requirements		Hours
EEC 621	Teaching Language Arts P-12	3
EESL 640	Teaching New Languages Through Reading and Writing [1]	3
EDR 600	Disciplinary Literacy P-12	3
EDR 650	Teaching Reading P-12	3
EDR 653	Literature for Grades P-12	3
EDR 655	Reading Assessment and Evaluation	3
EDR 659	Research and Problems in Reading	3
ECY 600	Introduction to Exceptional Learner [2]	3
EPR 594	Introduction to Educational Research Design	3
EDR 654	Dyslexia Research, Education & Advocacy	3
EDC 695	Coaching for Effective Instruction	3
EDR 690	Internship in Reading	3
Total Hours		**36**

1 Approved diversity course
2 Not required if previously completed

Educational Specialist in Education with a Concentration in K-6 & 6-12 Collaborative Teacher in Reading

The EdS in Education with a concentration in K-6 & 6-12 Collaborative Teacher in Reading program requires a minimum of 30 hours. A minimum GPA of 3.50 is required.

Requirements		Hours
EDR 650	Teaching Reading P-12	3
EDC 695	Coaching for Effective Instruction	3
EDR 655	Reading Assessment and Evaluation	3
EDR 659	Research and Problems in Reading	3
EDR 654	Dyslexia Research, Education & Advocacy	3
ECY 600	Introduction to Exceptional Learner [1]	3
EDR 690	Internship in Reading	3
Total Hours		**21**

Track 1

Requirements		Hours
ECT 620	Formative and Summative Assessment	3
ECT 621	IEP Programming and Lesson Planning	3
ECT 623	Instructional Methods	3
ECT 625	Positive Behavioral Supports [2]	3
ECT 631	Practicum in Collaborative Teaching	3
Total Hours		**15**

Track 2

Requirements		Hours
Collaborative Problem Solving with Field Experience and Research Project		
EDC 707	Introduction to Teacher Leadership	3
EDC 711	Analysis and Evaluation of Teaching	3
Cultural and Linguistically Responsive Instruction with Field Experience and Research Project		
EDC 732	Culturally and Linguistically Responsive Instruction [2]	3
Data Based Decision Making with Field Experience and Research Project		
EPR 594	Introduction to Educational Research Design	3
Total Hours		**12**

1 Not required if previously completed
2 Approved diversity course

Courses

EDR 521. Reading in Content Areas. 1 Hour.
Application of principles of reading process to content-area materials and instruction. Designed for pre-service teachers. Field experience required concurrently with the field experience in a teaching methods course. Supervision fee $100.

EDR 540. Developmental Reading I. 1-4 Hour.
Materials and methods. Emphasis on planning balanced program and understanding reading process. Includes field experiences. Prerequisite: Admission to 5th-Year Program.

EDR 541. Literature for Adolescents. 3 Hours.
In this course, students will explore literary works crafted for and centered on adolescents, with a focus on narratives that represent the rich diversity of human experiences. This course invites students to engage with stories and perspectives from a wide range of backgrounds, including but not limited to those of Black, Indigenous, people of color, and individuals with varying abilities. Emphasis will be placed on exploring and understanding the unique cultural and personal contexts embedded in multicultural literature for adolescents. Additionally, students will be invited to critically explore, examine, and reflect upon their own identities, perspectives, and worldviews in the context of the narratives encountered throughout the course.

EDR 543. Developmental Reading II. 1-4 Hour.
Reading process as it relates to content area materials. Includes field experience. Prerequisite: Admission to 5th-Year Program.
Prerequisites: EEC 612 [Min Grade: C]

EDR 551. Reading in Content Areas. 3 Hours.
The aim of this course is to provide secondary preservice teachers with the knowledge, tools, and strategies to design and implement literacy instruction within and across content areas. This will cultivate students' existing literacies while strengthening their discipline-specific literacy. Through a combination of actively engaging in readings, discussions to construct and solidify learning, and creating multi-modal products of their learning, pre-service teachers will explore various literacy methods and strategies, synthesize new learning with prior knowledge, and develop the ability to assess their own progress. Additionally, students will collaborate with peers in content-specific discussions, culminating in the creation of a three-lesson plan learning segment that incorporates content-area and discipline-specific literacy instruction and engagement strategies.

EDR 600. Disciplinary Literacy P-12. 3 Hours.
The purpose of this course is to provide candidates with the foundational knowledge to design or implement an integrated, comprehensive, and balanced curriculum. Specifically, candidates will gain an understanding of a how reading and writing relate to the disciplines and to local, state, national, and professional standards. Candidates will develop an understanding of how to implement curriculum based on students' prior knowledge, world experiences, and interests. Additionally, candidates will explore specific instructional strategies for supporting students as agents of their own learning to develop the ability to be critical consumers of the discipline. This knowledge affords teachers the ability to ultimately evaluate curriculum to ensure that instructional goals and objectives meet the reading and writing demands of the content area and/or discipline.

EDR 640. Reading Improvement Workshop. 3-6 Hours.
For inservice teachers of reading. Specific content varies according to needs of teachers.

EDR 650. Teaching Reading P-12. 3 Hours.
Understanding of reading process. Nature of reading programs; readiness motivation, methods, skills, assessment, evaluation, materials, and resources.

EDR 652. Pre and Early Reading Instruction. 3 Hours.
Theoretical bases, procedures, techniques, and materials for prereading and reading instruction. Prerequisite: Developmental reading course.

EDR 653. Literature for Grades P-12. 3 Hours.
Emphasis on needs of children, selection of books, societal issues in children's literature.

EDR 654. Dyslexia Research, Education & Advocacy. 3 Hours.
The purpose of this course is to provide candidates with an understanding of a balanced approach to literacy and research-based best practices for supporting literacy development among a diverse population of students. Additionally, this course provides knowledge of the approaches available to specialize curriculum for meeting the exceptional needs of students.

EDR 655. Reading Assessment and Evaluation. 3 Hours.
Examines evaluation techniques such as observation, standardized oral and silent reading tests and informal reading inventories such as miscue analysis.

EDR 659. Research and Problems in Reading. 3 Hours.
For teachers in elementary and early childhood education.

EDR 690. Internship in Reading. 1-3 Hour.
Supervised experience with children with reading difficulties. Prerequisites: Admission to reading certification program, permission of instructor and department.

EDR 701. Advanced Diagnosis and Remediation of Reading. 3 Hours.
Examination of serious reading disabilities; diagnosis, possible remediation strategies, and development; diagnosis, possible remediation strategies, and development of remediation plan in lab setting. Prerequisites: Master's degree and M.A.-level diagnostic reading course or permission of instructor.

EDR 702. Reading: Theoretical Foundations. 3 Hours.
Relates concepts of learning, development, and linguistics to reading-learning process; emphasis on current theory; implications for program planning and classroom practice. Prerequisites: EDR 650 or permission of instructor, and master's degree.
Prerequisites: EDR 650 [Min Grade: C]

EDR 703. Advanced Research in Reading. 3 Hours.
Research Prerequisites: EDR 650 and master's degree.
Prerequisites: EDR 650 [Min Grade: C]

EDR 704. Field Experience in Reading. 3-6 Hours.
Supervised field experiences under direction of qualified reading consultant or supervisor in school setting. Prerequisites: Admission to Sixth-Year Program for Reading Teacher and permission of instructor.

EDR 705. Reading Instruction Seminar. 3 Hours.
Examination of trends and issues in field of reading. topics determined by each class. Prerequisites: Master's degree and 9 graduate hours in reading or permission of instructor.

EDR 706. Research. 1-3 Hour.
Research Prerequisites: Master's degree and permission of instructor.

School Psychometry

UAB's School Psychometry program (Class A certification or M.A.Ed.) embodies a two-fold purpose. Its first purpose is to prepare candidates to serve as a school psychometrist to assist in meeting the evolving needs of learners, in grades K-12, within today's rapidly changing society. Its second purpose is to deliver cutting-edge instruction through a standards-based, inquiry-focused approach. This approach prepares candidates to administer psychological services in the schools. These services include the administration of psychoeducational assessments on students referred for special services. The program ensures that a quality program is available to candidates who may be unable to attend class during traditional class hours. This program is delivered through a totally online platform.

For detailed information regarding admission requirements for the School of Education and Human Sciences graduate programs, please visit the Admissions Requirements website at www.uab.edu/education/studentservices/admission-requirements.

Requirements		Hours
ECT 620	Formative and Summative Assessment	3
ECT 623	Instructional Methods	3
ECT 625	Positive Behavioral Supports	3
ECY 600	Introduction to Exceptional Learner	3
EPR 594	Introduction to Educational Research Design	3
EPR 614	Lifespan Human Development	3
ESP 600	Seminar in School Psychometry	3
ESP 627	Practicum in Schl Psych	1
ESP 628	Indiv Assess Child/Youth I	3
ESP 629	Indiv Assess Child/Youth II	3
ESP 689	Internship-School Psychometry	6

[1] Advisor approved electives at the 500 or 600 level.

School Psychometry Certification

The Graduate Non-Degree School Psychometry Certification Program requires a minimum of 31 credit hours.

Requirements		Hours
ESP 600	Seminar in School Psychometry	3
ECT 620	Formative and Summative Assessment	3
ECT 623	Instructional Methods [2]	3
EPR 614	Lifespan Human Development	3
ECT 625	Positive Behavioral Supports [2]	3
ESP 627	Practicum in Schl Psych	1
ESP 628	Indiv Assess Child/Youth I	3
ESP 629	Indiv Assess Child/Youth II	3
EPR 594	Introduction to Educational Research Design	3
ECY 600	Introduction to Exceptional Learner [1]	3
ESP 689	Internship-School Psychometry	6
Total Hours		**34**

[1] Not required if previously completed
[2] Approved diversity course

Program Requirements here

Master of Arts in Education in School Psychometry

The M.A.Ed. School Psychometry Program requires a minimum of 31credit hours.

Requirements		Hours
ESP 600	Seminar in School Psychometry	3
ECT 620	Formative and Summative Assessment	3
ECT 623	Instructional Methods [2]	3
EPR 614	Lifespan Human Development	3
ECT 625	Positive Behavioral Supports [2]	3
ESP 627	Practicum in Schl Psych	1
ESP 628	Indiv Assess Child/Youth I	3
ESP 629	Indiv Assess Child/Youth II	3
EPR 594	Introduction to Educational Research Design	3
ECY 600	Introduction to Exceptional Learner [1]	3
ESP 689	Internship-School Psychometry	6
Total Hours		**34**

[1] May not be required if previously completed
[2] Approved diversity course

Education Specialist (Ed.S.) in School Psychology

Approved April 14, 2023

Requirements		Hours
Instructional Support Area		
ESP 630	Applied Neuropsychology in the School	3
ESP 631	Crisis Intervention & Prevention in Schools	3
ESP 632	Consultation & Intervention for Learning & Behavior Problems	3
ESP 627	Practicum in Schl Psychometry	1
Survey of Special Education Course		
ECY 600	Introduction to Exceptional Learner	0-3
EDC 732	Culturally and Linguistically Responsive Instruction	3
Internship		
ESP 689	Internship-School Psychometry	12
Additional Courses		
ECT 527	Collaborative Processes	3
ECT 619	Methods of Reading Assessment, Instruction, and Intervention	3
ECY 689	Advanced Topics in Special Education/ School Psychometry	1
EPR 608	Introduction to Statistical Methods in Educational Research	3
Total Hours		**35-38**

Special Education

Welcome to UAB where students become skilled, reflective educators through Special Education graduate degree programs in Collaborative Teacher (CT) K-6 and/or 6-12, and Early Childhood Special Education (ECSE). These innovative programs offer degrees and/or certification at three levels—alternative master's, traditional master's and educational specialist.

The alternative master's program (AMP) is for graduate students who do not already hold teacher certification in elementary or early childhood education. To be eligible for seeking initial teacher certification at a master's level, applicants must have an undergraduate degree with a 2.75 GPA on their transcript from a regionally accredited college. They must have passed the Praxis Elementary Multiple Subjects exam in all three areas (math, social studies, and science) and have also met other criteria stipulated by the Alabama State Department of Education. Upon completing the AMP, candidates earn alternative Class A certification in this teaching field.

The traditional master's program (MAEd) is for teachers who already hold Class B initial certification in any area of education. Upon completing the MAEd, teachers earn Class A certification in the special education teaching field.

The Collaborative Teacher: Concentration in Reading Educational Specialist (EdS) degree program is for teachers who already hold either an Alabama Class B or Class A certificate in any field of special education OR general education who have at least 2 years of verified, full-time teaching experience with special populations or general populations and hold a valid Class A Professional Educator Certificate. Individuals pursuing this certificate/degree must complete one of two tracks in this program. The track selected depends upon the type of valid, prerequisite Alabama professional educator certificate held PRIOR to unconditional admission to the Class AA Program in Collaborative Teacher. Track 1 is for candidates who DO NOT currently hold a valid Alabama Class A Certificate in Collaborative Teacher. Candidates who must take this track of courses are those with a valid, prerequisite Alabama Class A Professional Educator Certificate in any teaching field (other than Collaborative Teacher). To be eligible to pursue Track 2 courses, candidates MUST hold a valid, prerequisite Alabama Class A Professional Educator Certificate in Collaborative Teacher.

For detailed information regarding admission requirements for the School of Education and Human Sciences graduate programs, please visit the Admissions Requirements website at https://www.uab.edu/education/studentservices/admission-requirements.

Master of Arts in Special Education Collaborative Teacher K-6 & 6-12

The MAEd in Special Education degree for the Collaborative Teacher K-6 & 6-12 program requires a minimum of 30 hours. A minimum program GPA of 3.25 is required.

Requirements		Hours
ECT 619	Methods of Reading Assessment, Instruction, and Intervention	3
ECT 620	Formative and Summative Assessment	3
ECT 621	IEP Programming and Lesson Planning	3
ECT 622	Language and Communication Facilitation	3
ECT 623	Instructional Methods	3
ECT 624	Sensory, Health and Physical Methods	3
ECT 625	Positive Behavioral Supports [1]	3
ECT 627	Collaborative Processes	3
ECT 628	Legal Issues and Trends	3
ECY 600	Introduction to Exceptional Learner [2]	3
ECT 631	Practicum in Collaborative Teaching	3
Total Hours		**33**

[1] Approved diversity course
[2] May not be required if previously completed

Master of Arts in Special Education Collaborative Teacher K-6 & 6-12 Fifth Year Alternative Master's

The MA.Ed. in Special Education degree for the Collaborative Teacher K-6 & 6-12 Fifth Year Alternative Master's program requires a minimum of 40 hours. A minimum GPA of 3.25 is required.

Requirements		Hours
ECT 523	Instructional Methods	3
ECT 524	Sensory, Health and Physical Methods	3
EEC 521	Methods of Teaching Foundations of Reading Development *	3
ECT 525	Positive Behavioral Supports [1]	3
ECT 528	Legal Issues and Trends	3
ECT 527	Collaborative Processes	3
ECY 600	Introduction to Exceptional Learner [2]	3
ECT 519	Methods of Reading Assessment, Instruction & Intervention *	3
ECT 520	Formative and Summative Assessment	3
ECT 521	IEP Programming and Lesson Planning	3
ECT 522	Language and Communication Facilitation	3
EEC 522	Methods of Teaching the Development of Reading Comprehension *	3
ECT 531	Internship in Collaborative Teaching	6
ECT 532	Student Teaching Seminar	1
Total Hours		**43**

[1] Approved diversity course
[2] May not be required if previously completed
* Courses designated to meet Alabama Literacy Act guidelines

Master of Arts in Early Childhood Special Education

The MAEd degree in Early Childhood Special Education program requires a minimum of 36 hours. A minimum GPA of 3.25 is required.

Requirements		Hours
ECY 635	Foundations of Early Childhood Special Education	3
ECY 637	Assessment in Early Childhood Special Education	3
ECT 621	IEP Programming and Lesson Planning	3
ECY 636	Early Intervention and Preschool Curriculum and Methods	3
ECT 655	Early Primary Curriculum and Methods	3
ECY 638	Physical and Health Care Support in Early Childhood Special Education	3
ECT 625	Positive Behavioral Supports [1]	3
ECT 654	Communication and Technology Applications In Early Childhood Special Education	3
ECY 639	Transdisciplinary Collaboration and Consultation in Early Childhood	3
or ECT 627	Collaborative Processes	
or ECY 689	Advanced Topics in Special Education/ School Psychometry	
EDR 652	Pre and Early Reading Instruction	3
ECY 600	Introduction to Exceptional Learner [2]	3
ECY 670	Practicum in Early Childhood Special Education	6
Total Hours		**39**

[1] Approved diversity course
[2] May not be required if previously completed

Master of Arts in Early Childhood Special Education Fifth Year Alternative Masters

The MA.Ed. degree in Early Childhood Special Education Fifth Year Alternative Masters program requires a minimum of 37 hours. A minimum GPA of 3.25 is required.

Requirements		Hours
Teaching Field Specific Methods Courses		
ECY 536	Early Intervention and Preschool Curriculum and Methods	3
ECT 555	Early Primary Curriculum and Methods	3
Learner Development, Learner Differences, and Learning Environments		
ECT 525	Positive Behavioral Supports [1]	3
Professional Learning and Ethical Practice		
ECY 535	Foundations of Early Childhood Special Education	3
Leadership and Collaboration		
ECT 527	Collaborative Processes	3
or ECY 689	Advanced Topics in Special Education/ School Psychometry	
Survey of Special Education Course (required if not completed previously)		
ECY 600	Introduction to Exceptional Learner [2]	3
Teaching Field		
ECY 537	Assessment in Early Childhood Special Education	3
ECT 521	IEP Programming and Lesson Planning	3
ECT 554	Communication & Technology Applications In Early Childhood Special Education	3
ECY 538	Physical and Health Care Support in Early Childhood Special Education	3
EDR 652	Pre and Early Reading Instruction	3
Internship		
ECY 672	Internship in Early Childhood Special Edu	6
ECT 532	Student Teaching Seminar	1
Total Hours		**40**

1 Approved diversity course
2 May not be required if previously completed

Educational Specialist in Education with a Concentration in K-6 & 6-12 Collaborative Teacher in Reading

The EdS in Education with a concentration in K-6 & 6-12 Collaborative Teacher in Reading program requires a minimum of 30 hours. A minimum GPA of 3.50 is required.

Requirements		Hours
EDR 650	Teaching Reading P-12	3
EDC 695	Coaching for Effective Instruction	3
EDR 655	Reading Assessment and Evaluation	3
EDR 659	Research and Problems in Reading	3
EDR 654	Dyslexia Research, Education & Advocacy	3
ECY 600	Introduction to Exceptional Learner [1]	3
EDR 690	Internship in Reading	3
Total Hours		**21**

Track 1

Requirements		Hours
ECT 620	Formative and Summative Assessment	3
ECT 621	IEP Programming and Lesson Planning	3
ECT 623	Instructional Methods	3
ECT 625	Positive Behavioral Supports [2]	3
ECT 631	Practicum in Collaborative Teaching	3
Total Hours		**15**

Track 2

Requirements		Hours
Collaborative Problem Solving with Field Experience and Research Project		
EDC 707	Introduction to Teacher Leadership	3
EDC 711	Analysis and Evaluation of Teaching	3
Cultural and Linguistically Responsive Instruction with Field Experience and Research Project		
EDC 732	Culturally and Linguistically Responsive Instruction [2]	3
Data Based Decision Making with Field Experience and Research Project		
EPR 594	Introduction to Educational Research Design	3
Total Hours		**12**

1 Not required if previously completed
2 Approved diversity course

Graduate Certificate in Supporting Individuals with Exceptionalities

Requirements		Hours
Select four of the following courses		12
ECY 600	Introduction to Exceptional Learner	
ECT 520	Formative and Summative Assessment	
or ECT 626	Formative and Summative Assessment	
ECT 523	Instructional Methods	
or ECT 623	Instructional Methods	
ECT 524	Sensory, Health and Physical Methods	
or ECT 624	Sensory, Health and Physical Methods	
ECT 525	Positive Behavioral Supports	
or ECT 625	Positive Behavioral Supports	
ECT 526	Assistive and Instructional Technology	
or ECT 626	Assistive and Instructional Technology	
ECT 527	Collaborative Processes	
or ECT 627	Collaborative Processes	
ECT 528	Legal Issues and Trends	
or ECT 628	Legal Issues and Trends	
ECT 529	Teaching Literacy and Reading in Inclusive Settings	
ECT 530	Effective Teaching and Learning	
KIN 649	Advanced Adapted Physical Education	

ECT-Collaborative Teacher Educ Courses

ECT 519. Methods of Reading Assessment, Instruction & Intervention. 3 Hours.
This 3-hour course will address knowledge and skills needed for selecting, administering, analyzing, interpreting, and discussing reading assessments. The foci of the course include utilizing the assessment data for the development of differentiated reading instruction, targeted intervention, and special education referral and review. Minimum grade of C required.
Prerequisites: ECY 600 [Min Grade: C] and ECT 520 [Min Grade: C]

ECT 520. Formative and Summative Assessment. 3 Hours.
In-depth analysis of testing, assessment, and accountability applied to special education. Analysis of applied issues such as standards-based reform, annual yearly progress, response to intervention, and program effectiveness. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities. [Course is for students in the Alternative Masters Program (AMP) only].
Prerequisites: ECY 600 [Min Grade: C]

ECT 521. IEP Programming and Lesson Planning. 3 Hours.
This course focuses on the diagnosis and evaluation of students with disabilities using a variety of developmentally appropriate curriculum-based assessments, criterion referenced, and norm-referenced tests. Emphasis is on the interpretation of information from assessments into Individualized Education Program annual goals and objectives, transition planning, and Response to Intervention planning. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 522. Language and Communication Facilitation. 3 Hours.
This course provides information on communication assessment and intervention procedures useful for teachers of students with disabilities. Includes an overview of normal and typical language development and research on effective naturalistic communication interventions. Candidates will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 523. Instructional Methods. 3 Hours.
This course provides information on research-based instructional strategies for equipping students with disabilities with the skills and knowledge that will help them thrive in the classroom and beyond the school day. Particular emphasis will be placed on general instructional strategies for the acquisition and generalization of skills. In addition, strategies for implementing individualized and effective programming will be addressed. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 524. Sensory, Health and Physical Methods. 3 Hours.
This course introduces research-based assessment and instructional strategies for equipping students with sensory, health, and physical disabilities with the skills and knowledge that will help them thrive in the classroom and beyond the school day. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 525. Positive Behavioral Supports. 3 Hours.
This course presents definition and measurement of behavior, reinforcement strategies, systematic program development, basic formats for classroom instruction, and techniques for monitoring student progress. There is an emphasis on procedures for increasing academic and socially appropriate behavior through simulations and practice exercises. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 526. Assistive and Instructional Technology. 3 Hours.
This course examines the use of computer-based instruction and management systems to facilitate classroom instruction. The course includes issues related to the integration of technology into instructional design, a review and analysis of educational software, an exploration of educational considerations of technology for individuals with disabilities, an evaluation of assistive technology options, and an overview of instructional and managerial computer applications. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 527. Collaborative Processes. 3 Hours.
This course provides a variety of collaborative options for supporting students with disabilities. These include collaborating with families, agencies, paraprofessionals as well as other professionals.
Prerequisites: ECY 600 [Min Grade: C]

ECT 528. Legal Issues and Trends. 3 Hours.
This course explores current laws and trends relating to special education.
Prerequisites: ECY 600 [Min Grade: C]

ECT 529. Teaching Literacy and Reading in Inclusive Settings. 3 Hours.
The purpose of this course is to provide teacher candidates with an understanding of a balanced approach to literacy and research -based best practices for supporting literacy development among a diverse population of students. This knowledge affords teachers the ability to choose curricular goals, design instruction, promote student achievement, and assess and /or report student to a variety of stakeholders.
Prerequisites: EDU 500 [Min Grade: C] and ECY 600 [Min Grade: C]

ECT 530. Effective Teaching and Learning. 3 Hours.
This course focuses on the effective teaching and learning of students with disabilities. Course work will focus on planning appropriate lessons that support the student, ways to engage all learners and analyze teaching effectiveness. Candidates will also learn ways of using feedback to guide further learning and ways of using assessment to inform instruction.
Prerequisites: EDU 500 [Min Grade: C] and ECY 600 [Min Grade: C]

ECT 531. Internship in Collaborative Teaching. 3-9 Hours.
These courses are required in UAB's Alternative Masters Program (AMP) for a Master of Arts in Education with Alternative Class A certification for teaching in the following areas: Collaborative Teacher K-6, Collaborative Teacher 6-12, Early Childhood Special Education, Visual Impairments P-12. The purpose of ECT 531 is to prepare teachers to use Best Practices for teaching within their content area. As stipulated by the ALSDE Administrative Code, determining readiness to serve as a certified teacher shall require competence to teach as demonstrated in an internship of 15 weeks of full-time student teaching. Collaborative Teacher K-6 and 6-12, and Visual Impairments P-12 interns will have two placements to satisfy their K-6 and 6-12 and P-12 certification requirements (i.e., 7.5 weeks in a K-5 placement and 7.5 weeks in a 6-12 placement).

ECT 532. Student Teaching Seminar. 1 Hour.
This course will accompany student teaching/internship to support and extend the efforts of student teaching. The course will focus on the successful completion of edTPA assignments and submission.

ECT 554. Communication & Technology Applications In Early Childhood Special Education. 3 Hours.
The purpose of this course is to provide information on communication facilitation and assistive and instructional technology applications for young children with delays or disabilities. The course examines (a) the use of various communication systems, (b) naturalistic communication strategies, (c) computer-based instruction and management systems to utilize assistive and instructional technology, (d) issues related to the integration of technology into instructional design, (e) a review and analysis of educational software, (f) an exploration of educational considerations of technology for young children with delays or disabilities, (g) an evaluation of assistive technology options, and (h) an overview of instructional and managerial computer applications. Candidates will incorporate evidence-based decision-making, IFSP and IEP development, and program planning to facilitate communication and provide instruction for young children with delays or disabilities and their families.

ECT 555. Early Primary Curriculum and Methods. 3 Hours.
Universal design, response to intervention, and co-teaching are central components of this course. This course provides information on providing evidence-based instructional strategies and support to young children (K-3) with delays or disabilities. The intent is to equip children (K-3) with the skills and knowledge that will help them thrive in the classroom, as well as other settings. Particular emphasis will be placed on applied teaching strategies for the acquisition and generalization of skills.

ECT 619. Methods of Reading Assessment, Instruction, and Intervention. 3 Hours.
This 3-hour course will address knowledge and skills needed for selecting, administering, analyzing, interpreting, and discussing reading assessments. The foci of the course include utilizing the assessment data for the development of differentiated reading instruction, targeted intervention, and special education referral and review. Minimum grade of C required.
Prerequisites: ECY 600 [Min Grade: C] and ECT 620 [Min Grade: C]

ECT 620. Formative and Summative Assessment. 3 Hours.
In-depth analysis of testing, assessment, and accountability applied to special education. Analysis of applied issues such as standards-based reform, annual yearly progress, response to intervention, and program effectiveness. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.

ECT 621. IEP Programming and Lesson Planning. 3 Hours.
This course focuses on the diagnosis and evaluation of students with disabilities using a variety of developmentally appropriate curriculum-based assessments, criterion referenced, and norm-referenced tests. Emphasis is on the interpretation of information from assessments into Individualized Education Program annual goals and objectives, transition planning, and Response to Intervention planning. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.

ECT 622. Language and Communication Facilitation. 3 Hours.
This course provides information on communication assessment and intervention procedures useful for teachers of students with disabilities. Includes an overview of normal and typical language development and research on effective naturalistic communication interventions. Candidates will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.

ECT 623. Instructional Methods. 3 Hours.
This course provides information on research-based instructional strategies for equipping students with disabilities with the skills and knowledge that will help them thrive in the classroom and beyond the school day. Particular emphasis will be placed on general instructional strategies for the acquisition and generalization of skills. In addition, strategies for implementing individualized and effective programming will be addressed. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 624. Sensory, Health and Physical Methods. 3 Hours.
This course introduces research-based assessment and instructional strategies for equipping students with sensory, health, and physical disabilities with the skills and knowledge that will help them thrive in the classroom and beyond the school day. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 625. Positive Behavioral Supports. 3 Hours.
This course presents definition and measurement of behavior, reinforcement strategies, systematic program development, basic formats for classroom instruction, and techniques for monitoring student progress. There is an emphasis on procedures for increasing academic and socially appropriate behavior through simulations and practice exercises. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.

ECT 626. Assistive and Instructional Technology. 3 Hours.
This course examines the use of computer-based instruction and management systems to facilitate classroom instruction. The course includes issues related to the integration of technology into instructional design, a review and analysis of educational software, an exploration of educational considerations of technology for individuals with disabilities, an evaluation of assistive technology options, and an overview of instructional and managerial computer applications. Students will incorporate data-based decision making, IEP development and lesson planning to teach students with disabilities.
Prerequisites: ECY 600 [Min Grade: C]

ECT 627. Collaborative Processes. 3 Hours.
This course provides a variety of collaborative options for supporting students with disabilities. These include collaborating with families, agencies, paraprofessionals as well as other professionals.
Prerequisites: ECY 600 [Min Grade: C]

ECT 628. Legal Issues and Trends. 3 Hours.
This course explores current laws and trends relating to special education.
Prerequisites: ECY 600 [Min Grade: C]

ECT 631. Practicum in Collaborative Teaching. 3-9 Hours.
The purpose of ECT 631 is to prepare teachers to use Best Practices for teaching within their content area. As stipulated by the ALSDE Administrative Code, determining readiness to serve as a certified teacher shall require competence to teach as demonstrated in a focused practicum experience. Field experience is required.

ECT 654. Communication and Technology Applications In Early Childhood Special Education. 3 Hours.
The purpose of this course is to provide information on communication facilitation and assistive and instructional technology applications for young children with delays or disabilities. The course examines (a) the use of various communication systems, (b) naturalistic communication strategies, (c) computer-based instruction and management systems to utilize assistive and instructional technology, (d) issues related to the integration of technology into instructional design, (e) a review and analysis of educational software, (f) an exploration of educational considerations of technology for young children with delays or disabilities, (g) an evaluation of assistive technology options, and (h) an overview of instructional and managerial computer applications. Candidates will incorporate evidence-based decision-making, IFSP and IEP development, and program planning to facilitate communication and provide instruction for young children with delays or disabilities and their families.

ECT 655. Early Primary Curriculum and Methods. 3 Hours.
Universal design, response to intervention, and co-teaching are central components of this course. This course provides information on providing evidence-based instructional strategies and support to young children (K-3) with delays or disabilities. The intent is to equip children (K-3) with the skills and knowledge that will help them thrive in the classroom, as well as other settings. Particular emphasis will be placed on applied teaching strategies for the acquisition and generalization of skills. In addition, strategies for implementing individualized and effective programming in all curricular areas will be addressed. Candidates will incorporate evidence-based decision-making, design instructional programs, provide instruction, and monitor the progress of children K-3 with delays or disabilities. The course also focuses on co-teaching and working as a member of the team along with paraprofessionals, related service personnel, general educators, and families.

ECT 679. Advanced Legal Aspects of Special Education. 3 Hours.
Provides students with an in-depth examination of legal information pursuant to individuals with disabilities. The Individuals with Disabilities Education Act and its related amendments, the Americans with Disabilities Act, and Section 504 of the Improvement Rehabilitation Act are major federal laws reviewed in this course. Special education litigation is also addressed during the course.
Prerequisites: ECT 650 [Min Grade: C]

ECT 700. ASD: An Introduction. 3 Hours.
The course provides candidates with an in-depth examination of the characteristics of individuals with autism spectrum disorders (ASD). Specific issues examined during the course include diagnostic and educational criteria as well as current research on etiology and medication. Additionally, the myriad challenges faced by individuals with ASD are examined. A broad overview of evidenced-based practices to support individuals with ASD is presented in the course. A developmental perspective of ASD across the life span is presented, and issues related to play and leisure, sexuality education, environmental supports, transition planning, and daily life skills are explored in the course. The nature and needs of individual with Asperger's Syndrome are also addressed in this course.

ECT 701. ASD: App of Assessment Inform. 3 Hours.
Candidates taking this course are required to critically review, administer, and interpret the results of common standardized assessments given to individuals with ASD. Additionally, candidates are required to develop informal assessments to monitor the academic and behavioral progress of individuals with ASD. The CAPS/Ziggarut model will be used by candidates to conduct a comprehensive, developmental assessment in order to develop and implement an educational program for a student with ASD.

ECT 702. ASD: Meth Mod to Sev Function. 3 Hours.
Methods course, with special emphasis on low-functioning learners an Individuals with autism spectrum disorders. Particular attention is given effective practices and strategies for teaching and promoting functional and adaptive behavior that will enhance the learner¿s social responsibility and independent performance of daily activities.

ECT 703. ASD: Meth High Funct Learn- Asp. 3 Hours.
Methods course, with special emphasis on learners with higher functioning autism spectrum disorders and Asperger Syndrome. Particular attention is given effective practices and strategies for teaching and promoting social skill development and proactive social interactions. Autism Spectrum Disorders: Methods for High Functioning Learners and Asperger's Syndrome. Field experience required.

ECT 704. ASD: Collaboration-Consultation. 3 Hours.
This is a collaboration/consultation course designed to increase the candidate's knowledge and skills in the areas of: (1) foundations of collaboration, consultation and teaming; (2) communication and problem-solving processes, (3) collaborative tools, technology and resources; (4) cultural and linguistic diversity issues related to collaboration; (5) collaboration in instructional and inclusive teams; (6) collaboration with families; and (7) consultation and collaboration with paraeducators, related service personnel, and other ancillary personnel. Leadership and advocacy as well as self-assessment/reflection of one's collaboration and consultation skills are addressed in the course.

ECT 705. ASD: Accommodating the Needs of Diverse Learners on the Spectrum. 3 Hours.
In this course, candidates will learn a variety of teaching strategies to support students with ASD from diverse backgrounds and those with diverse learning needs to access the general education curriculum. Response to Intervention and differentiated instruction are central components of the course. Candidates will learn a variety of strategies for providing accommodations for students with ASD who present with behavior, communication, attention, and cognitive challenges in general education classroom settings. Strategies for supporting students in general education classrooms in the areas of literacy and math are covered in the course. Candidates will also acquire strategies for facilitating second language acquisition for English Language Learners.

ECT 706. ASD: Advanced Social and Behavioral Methods. 3 Hours.
A major focus of this course is the utilization of applied analysis to support students with ASD who present behavioral challenges. Development of behavioral objectives, data collection procedures, single-subject design and functional behavior assessment are addressed in the course. Strategies for addressing antecedents to behavior and consequences of behavior are explored. Generalization and self-monitoring/self-regulatory strategies are addressed. Candidates will learn a variety of positive environmental supports and classroom management strategies. Strategies for facilitating the development of social skills, including the use of social stories and video modeling, are addressed in the course.

ECT 707. Autism Spectrum Disorders: Transition and Life Skills Programming. 3 Hours.
The transition needs of individuals with ASD from preschool, middle school, high school and post-secondary settings is examined in this course. Transition models, assessment and planning are core components of the course. Facilitating the development of self-advocacy and self-determination skills in individuals with ASD are addressed. Independent living skills and transition to community are included in the course. Transition education curricula and instructional strategies for facilitating successful employment and post-secondary education are addressed in the course. Interagency and interdisciplinary collaboration as well as job placement, training, and supervision, are components of this course.

ECT 708. Autism Spectrum Disorders: Legal, Ethical, and Professional Issues. 3 Hours.
This course has three major components. First, special education legislation and case law related to the IDEA, Section 504, the ADA, FERPA, and the Elementary and Secondary Act are explored. Second, this course requires candidates to examine ethical issues in special education and to develop a personal code of ethics in special education based upon the Alabama Code of Ethics for Educators and the Council for Exceptional Children Code of Ethics. Third, the professional leadership skills of candidates in this course are developed. Development of candidates' teacher leadership, mentorship, and advocacy skills is undertaken during in the course.

ECT 710. ASD: Practicum. 3 Hours.
To meet the requirements of this course, candidates will engage in a variety of integrated experiences in applied settings, including K-6, 6-12, and community settings. Please refer to the clinical and field experiences handbook for specifics regarding practicum requirements.

ECT 711. ASD: K-6 Internship. 3 Hours.
To meet the requirements of this course, candidates must complete an in-depth clinical experience in a K-6 setting that includes children and youth with ASD. Please refer to the clinical and field experiences handbook for specifics regarding internship requirements.

ECT 712. ASD: 6-12 Internship. 3 Hours.
To meet the requirements of this course, candidates must complete an in-depth clinical experience in a 6-12 setting that includes children and youth with ASD. Please refer to the clinical and field experiences handbook for specifics regarding internship requirements.

ECT 720. Universal Design for Lrn. 3 Hours.
This course covers the following areas: Accommodations/Modifications, Differentiated Instruction, Behavioral Strategies, Positive Learning Environments, Student Engagement, and Demonstration Teaching.

ECT 720L. Field Experience. 1 Hour.
This course covers the following areas: Accommodations/Modifications, Differentiated Instruction, Behavioral Strategies, Positive Learning Environments, Student Engagement, and Demonstration Teaching.

ECT 720R. Action Research. 1 Hour.
This course covers the following areas: Accommodations/Modifications, Differentiated Instruction, Behavioral Strategies, Positive Learning Environments, Student Engagement, and Demonstration Teaching.

ECY-Special Education Courses

ECY 535. Foundations of Early Childhood Special Education. 3 Hours.
This is the introductory graduate course in the early childhood special education program, which is designed to provide an overview of the field of early intervention/early childhood special education (EI/ECSE) and address policy issues, the importance of collaboration, and future directions. Candidates must develop competencies in the areas of historical and philosophical foundations of EI/ECSE, federal, state, and local laws and legal requirements, characteristics of young children with known or suspected disabilities, family-professional partnerships, service delivery options, recommended practices, current policy issues and trends, and professionalism and ethics. Another important aspect of this course is professional development and life-long learning. Candidates must demonstrate a number of research and technology skills such as: accessing resources to support graduate studies; conducting reviews of the early childhood special education resources and literature; using American Psychological Association (APA) professional style writing; utilizing technology to support graduate studies; and identifying professional development resources for life-long learning. Course content and assignments are designed to promote critical thinking, problem solving skills, evidence-based practice application, and resource identification.

ECY 536. Early Intervention and Preschool Curriculum and Methods. 3 Hours.
The purpose of this course is to provide candidates with the knowledge, skills, methods, and attitudes necessary to deliver effective intervention/education to young children (birth through five) with known or suspected disabilities and their families from a variety of social, ethnic, and racial backgrounds. The course will include discussions and readings on topics central to an adequate understanding of the conceptual and theoretical foundations underlying current curriculum and methods for young children. Special emphasis will be placed on supporting families in all aspects of intervention. Attention will be given to developmentally and individually appropriate practices that facilitate inclusive environments. Candidates will be familiarized with instructional strategies and technologies. Course content and assignments will promote the use of critical thinking skills, problem solving, and technologies as they are applied to instructional programs for young children with known or suspected disabilities and their families. The course objectives will be assessed through completion of the course requirements and class participation. The content of this course is based on evidence-based practices, which integrate the best available research evidence with professional and family wisdom and values. Emphasized throughout this course are the following objectives: how to be a member of a transdisciplinary team in providing instruction, how to respond to cultural diversity, how to provide services in high-poverty communities and LEAs, and how to utilize evidence-based practices in all aspects of services. These priority areas will be addressed throughout the course.
Prerequisites: EDU 500 [Min Grade: C] and ECY 600 [Min Grade: C] and ECY 535 [Min Grade: C] and ECY 537 [Min Grade: C]

ECY 537. Assessment in Early Childhood Special Education. 3 Hours.
The purpose of this course is to prepare the candidate with knowledge and practical applications regarding the screening and assessment of young children with known or suspected disabilities (ages birth through eight). Both child-level and family-level assessment procedures will be emphasized. The candidate completing this course will be prepared to make professional decisions regarding the screening, assessment, program planning, and progress monitoring of young children with disabilities. Course content and assignments will promote critical thinking and problem solving skills. The content of this course is based on evidence-based practices, which integrate the best available research evidence with professional and family wisdom and values. Emphasized throughout this course are the following objectives: how to be a member of a transdisciplinary team in providing services in the natural environment, how respond to cultural diversity, how to provide services in high-poverty communities and LEAs, and how to utilize evidence-based practices in all aspects of assessment. These priority areas will be addressed throughout the course.

ECY 538. Physical and Health Care Support in Early Childhood Special Education. 3 Hours.
The purpose of this course is to provide candidates with the knowledge, skills, methods, and attitudes necessary to deliver effective intervention/education to young children with physical and health impairments. The course will include discussions and readings on topics central to an adequate understanding of the conceptual and theoretical foundations underlying typical and atypical motor development and neurodevelopment. Candidates will become proficient in motor skill facilitation, positioning, handling, feeding and health care support. The course objectives will be assessed through completion of the course requirements and class participation.

ECY 539. Transdisciplinary Collaboration and Consultation in Early Childhood. 3 Hours.
This course is designed for students to develop the knowledge, skills, and ability to work collaboratively with other professionals who provide inclusive services to infants and young children with delays or disabilities and their families. Emphasis will be placed on working as members of teams, which include families, early childhood special education, and the related services of physical and occupational therapy. Topics include teamwork, group decision-making, team process, leadership, and communication, the evidence that supports these practices, and how such issues influence services for young children and their families. A significant portion of content/discussion will focus on the roles and functions of various disciplines (including family members) as team members. Case studies will be used in simulations of transdisciplinary teamwork in action.

ECY 600. Introduction to Exceptional Learner. 3 Hours.
An overview of exceptionality as it pertains to children and adults. Both high and low incidence populations will be examined. Each area of exceptionality will be reviewed in terms of etiology, diagnosis, prevalence, remediation, and educational strategies.

ECY 635. Foundations of Early Childhood Special Education. 3 Hours.
This is the introductory graduate course in the early childhood special education program, which is designed to provide an overview of the field of early intervention/early childhood special education (EI/ECSE) and address policy issues, the importance of collaboration, and future directions. Candidates must develop competencies in the areas of historical and philosophical foundations of EI/ECSE, federal, state, and local laws and legal requirements, characteristics of young children with known or suspected disabilities, family-professional partnerships, service delivery options, recommended practices, current policy issues and trends, and professionalism and ethics. Another important aspect of this course is professional development and life-long learning. Candidates must demonstrate a number of research and technology skills such as: accessing resources to support graduate studies; conducting reviews of the early childhood special education resources and literature; using American Psychological Association (APA) professional style writing; utilizing technology to support graduate studies; and identifying professional development resources for life-long learning. Course content and assignments are designed to promote critical thinking, problem solving skills, evidence-based practice application, and resource identification.

ECY 636. Early Intervention and Preschool Curriculum and Methods. 3 Hours.
The purpose of this course is to provide candidates with the knowledge, skills, methods, and attitudes necessary to deliver effective intervention/education to young children (birth through five) with known or suspected disabilities and their families from a variety of social, ethnic, and racial backgrounds. The course will include discussions and readings on topics central to an adequate understanding of the conceptual and theoretical foundations underlying current curriculum and methods for young children. Special emphasis will be placed on supporting families in all aspects of intervention. Attention will be given to developmentally and individually appropriate practices that facilitate inclusive environments. Candidates will be familiarized with instructional strategies and technologies. Course content and assignments will promote the use of critical thinking skills, problem solving, and technologies as they are applied to instructional programs for young children with known or suspected disabilities and their families. The course objectives will be assessed through completion of the course requirements and class participation.

ECY 637. Assessment in Early Childhood Special Education. 3 Hours.
The purpose of this course is to prepare the candidate with knowledge and practical applications regarding the screening and assessment of young children with known or suspected disabilities (ages birth through eight). Both child-level and family-level assessment procedures will be emphasized. The candidate completing this course will be prepared to make professional decisions regarding the screening, assessment, program planning, and progress monitoring of young children with disabilities. Course content and assignments will promote critical thinking and problem solving skills. The content of this course is based on evidence-based practices, which integrate the best available research evidence with professional and family wisdom and values. Emphasized throughout this course are the following objectives: how to be a member of a transdisciplinary team in providing services in the natural environment, how respond to cultural diversity, how to provide services in high-poverty communities and LEAs, and how to utilize evidence-based practices in all aspects of assessment. These priority areas will be addressed throughout the course.

ECY 638. Physical and Health Care Support in Early Childhood Special Education. 3 Hours.
The purpose of this course is to provide candidates with the knowledge, skills, methods, and attitudes necessary to deliver effective intervention/ education to young children with physical and health impairments. The course will include discussions and readings on topics central to an adequate understanding of the conceptual and theoretical foundations underlying typical and atypical motor development and neurodevelopment. Candidates will become proficient in motor skill facilitation, positioning, handling, feeding and health care support. The course objectives will be assessed through completion of the course requirements and class participation.

ECY 639. Transdisciplinary Collaboration and Consultation in Early Childhood. 3 Hours.
This course is designed for students to develop the knowledge, skills, and ability to work collaboratively with other professionals who provide inclusive services to infants and young children with delays or disabilities and their families. Emphasis will be placed on working as members of teams, which include families, early childhood special education, and the related services of physical and occupational therapy. Topics include teamwork, group decision-making, team process, leadership, and communication, the evidence that supports these practices, and how such issues influence services for young children and their families. A significant portion of content/discussion will focus on the roles and functions of various disciplines (including family members) as team members. Case studies will be used in simulations of transdisciplinary teamwork in action.

ECY 670. Practicum in Early Childhood Special Education. 3-6 Hours.
Provides individualized field-based experiences to meet the unique needs of graduate candidates in ECSE. Students complete practicum experiences in settings that include children who present a wide range of disabilities within the 0-3, 3-5, 5-8 year age ranges. This practicum experience is tailored to the unique needs and experiences of each student.

ECY 672. Internship in Early Childhood Special Edu. 3-6 Hours.
Provides individualized field-based experiences that will meet the unique needs of ECSE candidates in the 5th year, nontraditional program. Students complete an internship in settings that include children who present a wide range of disabilities within the 0-3, 3-5, 5-8 year age ranges. This internship experience is tailored to the unique needs and experiences of each student.

ECY 689. Advanced Topics in Special Education/ School Psychometry. 1-6 Hour.
This course is designed to help candidates be scholars in the field of school psychology/psychometry. Candidates will learn the steps to explore, build on, and write about the literature on a topic in school psychology/psychometry. In this way, they will understand how to create new areas of scholarship to extend knowledge on a topic in their discipline.

Teaching English to Speakers of Other Languages

UAB offers an Educational Specialist degree in Teaching English to Speakers of Other Languages (TESOL). As a post-MA degree, this EdS-TESOL provides advanced training in the teaching and learning of English as a Second Language (ESL) and English as a Foreign Language (EFL). Targeted for educators who already hold a master's degree in TESOL or a related area, this program equips TESOL educators with state-of-the-art instructional strategies for meeting the evolving needs of linguistically and culturally diverse learners, with collaborative skills for serving as reflective practitioners to guide change, and with mentoring techniques for positively influencing student achievement and institutional improvement. This EdS-TESOL prepares educators to assume mentorship and leadership roles to guide other educators in meeting the English-learning needs of their students in P-12 and adult settings. To that end, it prepares educators to become dynamic leaders and effective change agents by developing their capacity to serve as lead teachers, division heads, instructional coaches, professional development facilitators, and program specialists.

The EdS-TESOL has two tracks. The certification track is for Alabama teachers who hold Class A certification in any teaching field from the Alabama State Department of Education (ALSDE) and who wish to earn Class AA certification in ESL. The professional track does not lead to K-12 certification from the ALSDE; it is for ESL teachers in other states and also for ESL teachers of adult learners.

At UAB, this EdS-TESOL degree is classified by the National Center for Education Statistics (NCES) with code 13.1401 *Teaching English as a Second or Foreign Language*. In the NCES Classification of Instructional Programs (CIP), this code defines programs that "focus on the principles and practice of teaching English to students who are not proficient in English or who do not speak, read or write English, and that may prepare individuals to function as teachers and administrators in such programs." Within this code, UAB's EdS-TESOL program is unique in how it offers two distinct tracks - the certification track and the non-certification track.

NOTE: For information about the ESL master's, please visit English as a Second Language (p. 229).

Educational Specialist (EdS) in TESOL (Certification)

This track leads to Class AA certification in ESOL issued by ALSDE. Students who hold Class A certification in ESOL complete 30 hours which must include EESL 647, EESL 657, EESL680, and EESL 687. Students who hold Class A in another teaching field complete 36 hours which must include EESL 610, 612, 613, 615, 625, 630, 640, 680, and 690. For Class AA certification in ESOL, the minimum required program GPA is 3.50.

Requirements		Hours
ECY 600	Introduction to Exceptional Learner [1]	
Track 1 (candidates w/Class A in non-ESOL teaching field)		**12-15**
Requirements		
EESL 610	Second Language Acquisition (if not already taken)	
EESL 612	Curriculum, Programs and Policies	
EESL 615	Grammar and Linguistics for ESL Teachers	
EESL 625	Phonology for Second Language Teachers	
EESL 640	Teaching New Languages Through Reading and Writing	
(EESL 647 if EESL 640 was used towards an earlier degree)		
Track 2 (candidates with Class A in ESOL)		**12**
Requirements		
EESL 647	Instruction and Assessment: Reading and Writing	
EESL 657	Instruction and Assessment: Listening and Speaking	
Two advisor-approved ESL electives from among the following courses		
EESL 617	Teaching English in a Global Context	
EESL 627	Teaching Adult Language Learners	

EESL 637	Methods Teaching English as an International Language	
Advisor-approved courses in ESL or related to ESL (3-6 hours)		
National Board Certification in English as New Language by enrolling in EESL 681 and EESL 677 (6 hrs)		
EESL 681 & EESL 677	National Boards in English as a New Language and Field Studies (National Board Certification in English as New Language)	
Diversity		**3**
EDC 732	Culturally and Linguistically Responsive Instruction [2]	
Additional Courses		
Track 1 (candidates w/Class A in non-ESOL teaching field)		6
EESL 630	Methods and Materials of Teaching ESL (EESL 637 if EESL 630 was used towards earlier degree.)	
EESL 690	Internship in Second and Foreign Languages, P-12 (The internship will be teaching ESOL and divided between early childhood/elementary and middle/secondary.)	
Track 2 (for candidates with Class A in ESOL)		3
EESL 687	English for Specific Purposes	
Elective		**3**
Choose one of the following:		
EESL 613	Teaching ESL in a Multicultural Society	
EESL 641	Teaching Emergent Bilingual Learners in the Early Childhood Setting	
EESL 670	Engaging Families and Communities	
EDC 695	Coaching for Effective Instruction	
EPR 608	Introduction to Statistical Methods in Educational Research	
Any Approved 600-level EESL course		
Research		**6**
EPR 594	Introduction to Educational Research Design	
EPR 596	Introduction to Qualitative Methods in Educational Research (Capstone)	
Capstone		**3**
EESL 680	Research in ESL	
Total Hours		**30-36**

[1] Required if not previously completed.
[2] Approved diversity course

Educational Specialist (EdS) in TESOL (Professional Track)

*This track does **not** leads to Class AA certification in ESOL issued by ALSDE. 30-37 Credit hours.*

Requirements		Hours
EESL 610	Second Language Acquisition [1]	3
EESL 697	ESL Practium	1-3
Advisor-Approved Teaching Field Course		**12**
EESL 612	Curriculum, Programs and Policies	
EESL 615	Grammar and Linguistics for ESL Teachers	
EESL 620	Special Topics in ESL	
EESL 625	Phonology for Second Language Teachers	
EESL 627	Teaching Adult Language Learners	
EESL 630	Methods and Materials of Teaching ESL	
EESL 637	Methods Teaching English as an International Language	
EESL 640	Teaching New Languages Through Reading and Writing	
EESL 641	Teaching Emergent Bilingual Learners in the Early Childhood Setting	
EESL 643	Promoting Global Peace through TESOL	
EESL 647	Instruction and Assessment: Reading and Writing	
EESL 657	Instruction and Assessment: Listening and Speaking	
EESL 660	Effective Teaching and Learning	
EESL 670	Engaging Families and Communities	
EESL 687	English for Specific Purposes	
EESL 681	National Boards in English as a New Language	
Any Approved 600-level EESL course		
Diversity Course		**3**
EESL 613	Teaching ESL in a Multicultural Society	
EESL 617	Teaching English in a Global Context	
EDC 732	Culturally and Linguistically Responsive Instruction	
EPR 594	Introduction to Educational Research Design	3
Another Research Course		**3**
EESL 680	Research in ESL	
EPR 596	Introduction to Qualitative Methods in Educational Research	
EPR 608	Introduction to Statistical Methods in Educational Research	
Advisor-Approved Education Courses		**9**
EDC 695	Coaching for Effective Instruction	
EDC 707	Introduction to Teacher Leadership	
EDC 711	Analysis and Evaluation of Teaching	
EESL 677	Field Studies	
Any Approved 600-level EESL course		
Total Hours		**34-36**

[1] Required if not previously taken.

Graduate Certificate in Teaching English as an Additional Language

Requirements		Hours
EESL 625	Phonology for Second Language Teachers	3
EESL 627	Teaching Adult Language Learners	3
EESL 637	Methods Teaching English as an International Language	3
EESL 687	English for Specific Purposes	3
EESL 677	Field Studies	3
EESL 007	Community English Teaching	0
Total Hours		**15**

Graduate Certificate in Teaching Multilingual Learners

Graduate Certificate in Teaching Multilingual Learners

Requirements		Hours
EESL 510	Second Language Acquisition	3
or EESL 610	Second Language Acquisition	
Advisor Approved Electives		**9**
Select 9 credits of Electives from EESL 512:697 for approval		
Total Hours		**12**

Courses

EESL 510. Second Language Acquisition. 3 Hours.
An in-depth look at major theories of second language acquisition. Exploration of learning environments, programs, home language, culture, and other factors that influence second language acquisition. This course entails 30 hours of field experiences. Required for the Alternative Master's.

EESL 512. Curriculum, Program, Policies. 3 Hours.
Introduction to the curriculum, programs, policies, and laws that support new language learners with respect to legal issues, instructional strategies, accommodations, assessments, and support networks and that are grounded in second language acquisition theory. This course entails 5 days of field experiences in an English learner summer program. Required for the Alternative Master's in ESL.

EESL 513. Teaching ESL in a Multicultural Society. 3 Hours.
Designed to introduce students to the goals, principles, and practices of multicultural education and to sensitize students to cultural pluralism in the United States. Required for the Alternative Master's.

EESL 515. Grammar and Linguistics for ESL Teachers. 3 Hours.
A critical study of aspects of Modern English grammar and linguistics that are important for the teaching of English as a Second or Foreign Language. Students will gain an understanding of the major syntactic and semantic phenomena important for teaching ESL/EFL, become familiar with the practical and theoretical literature on teaching English grammar, participate in practical exercises, and develop instructional activities that embed grammar skills into content-driven lessons. Required for the Alternative Master's.

EESL 525. Phonology for Second Language Teachers. 3 Hours.
An introduction to phonology and its application to the teaching of a second or foreign language. Students learn the phonological structure of the English language, analyze examples from language learner data, diagnose pronunciation difficulties experienced by language learners from different first languages, and identify instructional strategies for assisting language learners to perceive and produce challenging sounds. Required for the Alternative Master's.

EESL 530. Methods and Materials of Teaching ESL. 3 Hours.
Examines traditional and current approaches for teaching English to speakers of other languages and curriculum materials, texts, and other resources. This course entails 30 hours of field experiences. Required for the Alternative Master's.

EESL 540. Teaching New Languages Through Reading and Writing. 3 Hours.
Theory, research and practice in reading and writing for second language learners. Implications for teaching reading and writing skills that allow second language learners to participate in the full range of academic situations. This course entails 30 hours of field experiences. Required for the Alternative Master's.

EESL 560. Effective Teaching and Learning. 3 Hours.
This course prepares candidates to plan, teach, and assess second and foreign languages in school settings: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment. This course entails 30 hours of field experience. Required for the Alternative Master's in ESL, French, and Spanish.

EESL 570. Engaging Families and Communities. 3 Hours.
This course prepares professional educators to engage families and communities with the overarching idea of shared responsibility for the English learner's academic success. In this course, UAB candidates will determine what family engagement could look like over time and through multiple levels, starting with individual engagement, the engagement of a school, and of a school system.

EESL 589. Internship Seminar in ESL. 1 Hour.
Provides an opportunity to explore in-depth effective ways to deliver instruction during the internship experience.

EESL 590. Internship in Second and Foreign Languages, N-12. 6 Hours.
Meets the internship requirements of the state code. Interns are engaged in the full scope of teaching activities including planning and delivering lessons, evaluating students, and conducting managerial tasks and other appropriate duties.

EESL 600. TESOL Residency. 0 Hours.
Students in the EdS program's non-certification track must enroll in EESL 008 during the summer term. During their two-week residency at UAB, they will participate in a TESOL institute on campus and also visit TESOL sites off-campus.

EESL 601L. Community English Teaching. 0-1 Hours.
Students co-teach weekly Community English Classes.

EESL 610. Second Language Acquisition. 3 Hours.
An in-depth look at major theories of second language acquisition. Exploration of learning environments, home language, culture, and other factors that influence second language acquisition. This course entails 30 hours of working with English learners in one's own educational context.

EESL 612. Curriculum, Programs and Policies. 3 Hours.
Introduction to the curriculum, programs, policies, and laws that support new language learners with respect to legal issues, support networks, instructional strategies, assessments, and accommodations and that are grounded in second language acquisition theory. This course entails 3 days of field experiences in an English learner summer program.

EESL 613. Teaching ESL in a Multicultural Society. 3 Hours.
Designed to introduce students to the goals, principles, and practices of multicultural education and to sensitize students to cultural pluralism in the United States.

EESL 615. Grammar and Linguistics for ESL Teachers. 3 Hours.
A critical study of aspects of Modern English grammar and linguistics that are important for the teaching of English as a Second or Foreign Language. Students will gain an understanding of the major syntactic and semantic phenomena important for teaching ESL/EFL, become familiar with the practical and theoretical literature on teaching English grammar, participate in practical exercises, and develop instructional activities that embed grammar skills into content-driven lessons.

EESL 617. Teaching English in a Global Context. 3 Hours.
Provides a sociolinguistic perspective on the globalization of English and on the emergence and teaching of English as an International Language. Students explore dialectology, language change, language diversity, language ideology and power, national language policies, World Englishes, the growing number of non-native English speakers, and attitudes of native and non-native English speakers toward the domination of English.

EESL 620. Special Topics in ESL. 3 Hours.
Topics will vary from year to year.

EESL 625. Phonology for Second Language Teachers. 3 Hours.
An introduction to phonology and its application to the teaching of a second or foreign language. Students learn the phonological structure of the English language, analyze examples from language learner data, diagnose pronunciation difficulties experienced by language learners from different first languages, and identify instructional strategies for assisting language learners to perceive and produce challenging sounds.

EESL 627. Teaching Adult Language Learners. 3 Hours.
Introduces goals, principles, and practices for teaching English to adult learners, addresses the influence of varying backgrounds on adult language learning, and examines ways to evaluate adults' second language development. After learning to recognize quality components in distinct program models, as outlined by TESOL Standards for Adult Education ESL Programs, students do a critical study of community-based or other English language programs.

EESL 630. Methods and Materials of Teaching ESL. 3 Hours.
Examines traditional and current approaches to teaching English to speakers of other languages and curriculum materials, texts, and other resources, specifically within PK-12 settings. This course entails 40 hours of field experience working with English learners in one's own school.

EESL 637. Methods Teaching English as an International Language. 3 Hours.
Prepares students to teach English as an International Language by using methods, strategies, and techniques appropriate for adults in ESL contexts and for all learners in EFL contexts both for in-person and online instruction. Engaged with approaches aligned with TESOL Standards for ESL/EFL Teachers of Adults, students review language learning needs for 5 program settings: adult/community, workplace, college/university, intensive English, and English as a Foreign Language. During the semester, students design and implement a curriculum for instruction and assessment of language learning outcomes. This course entails 30 hours of field experiences.

EESL 640. Teaching New Languages Through Reading and Writing. 3 Hours.
Theory, research and practice in reading and writing for second language learners. Implications for teaching reading and writing skills that allow second language learners to participate in the full range of academic situations. This course entails 8 hours of field experiences at another school and 32 hours working with English learners in one's own school.

EESL 641. Teaching Emergent Bilingual Learners in the Early Childhood Setting. 3 Hours.
This course prepares candidates to work effectively with emergent bilingual learners in the early childhood setting. Candidates will gain context knowledge needed to design curriculum, including literacy, appropriate for emergent bilingual learners and will learn how culture and home language impacts learning additional languages.

EESL 643. Promoting Global Peace through TESOL. 3 Hours.
This course guides graduate students in understanding and facilitating the promotion of global peace within and out of the TESOL classroom through listening, speaking, reading and writing. The goal of this course is for educators to learn to use the tools of negotiation, arbitration, and mediation with an overarching focus on peacekeeping, peacemaking, and peacebuilding.

EESL 647. Instruction and Assessment: Reading and Writing. 3 Hours.
Addresses linguistic, sociocultural, psychological, and educational factors that affect literacy development of English as an additional language. Grounded in theoretical and practical aspects of teaching second language (L2) reading and writing to adolescents and adults in diverse communities, students learn to implement effective instructional strategies for promoting literacy in English as an additional language. To measure attainment of L2 reading and writing skills, students learn to design and conduct authentic assessments and to administer standardized assessments. This course entails 30 hours of field experiences.

EESL 650. Strategies for Teaching Math and Science to ELLs. 3 Hours.
Provides knowledge and strategies for making math and science accessible to ELLs at all grade levels, K-12. Classroom teachers will learn to make accommodations for teaching ELLs within a sheltered instruction framework.

EESL 657. Instruction and Assessment: Listening and Speaking. 3 Hours.
Examines how spoken communication is structured so that it is socially appropriate and linguistically accurate. Students learn principles and best practices for the contextualized teaching of second language (L2) listening and speaking skills to adolescent and adult learners. After exploring the purposes, types, and availability of formal testing tools to assess the attainment of these skills in English as an additional language, students also learn to generate and conduct their own tests for assessing L2 listening and speaking. This course entails 30 hours of field experiences.

EESL 660. Effective Teaching and Learning. 3 Hours.
This course prepares candidates to plan teach and assess second and foreign languages in school settings: making informed decisions about context, learners, learner differences, teaching strategies, methodologies, curricula, and assessment. This course entails 30 hours of field experience. Required for the traditional Master's in ESL.

EESL 670. Engaging Families and Communities. 3 Hours.
This course prepares professional educators to engage families and communities with the overarching idea of shared responsibility for the English learner's academic success. In this course, UAB candidates will determine what family engagement could look like over time (in school years) and through multiple levels, starting with individual engagement, the engagement of a school, and of a school system.

EESL 677. Field Studies. 1-3 Hour.
Students participate in field studies related to the teaching of English as a second or foreign language.

EESL 680. Research in ESL. 3 Hours.
Primary types of research conducted in second language teaching and learning and how these methods can be used to inform teaching. Introduction to classroom-based second language research approaches.

EESL 681. National Boards in English as a New Language. 3 Hours.
This course prepares experienced teachers for National Board Candidacy in English as a New Language (ENL). Students enrolled in this course may be either pre-candidates or candidates for National Board Certification.

EESL 687. English for Specific Purposes. 3 Hours.
This inquiry-focused course guides emerging teachers in experiencing the differentiated facets of working in adult ESL and EFL environments. Students explore English for Specific Purposes and related issues in Intensive English Programs, English for Occupational Purposes, Program Administration, and English as an International Language. Students observe classes in regional IEPs, develop an EOP program, receive hands-on experience in administration, apply research to various adult EIL teaching situations, and do an in-depth study of an EFL context.

EESL 689. Seminar in ESL. 1 Hour.
Provides an opportunity to explore in-depth effective ways to deliver instruction during the internship experience. Must be taken concurrently with EESL 690.
Prerequisites: EESL 610 [Min Grade: C]

EESL 690. Internship in Second and Foreign Languages, P-12. 3 Hours.
Meets the internship requirements of the state code. Interns are engaged in the full scope of teaching activities including planning and delivering lessons, evaluating students, and conducting managerial tasks and other appropriate duties. This course entails 2 weeks of internship in an English learner summer program. Approval of internship application for the traditional master's.

EESL 697. ESL Practium. 1-3 Hour.
In this practicum course, prospective ESL/EFL teachers shadow a professional ESL teacher when teaching an Academic English class. As needed, they also provide specialized support for the ESL students in that class. To enhance their professional growth, these prospective teachers share their reflections and newly-acquired competencies with the EESL 697 course instructor.

EESL 698. Teaching Apprenticeship. 2-3 Hours.
This required teaching apprenticeship is housed in a standards-based course that offers practical application of the knowledge and skills learned in other courses for teaching ESL. After having completed one semester of structured observations of professional ESL educators and participated in corresponding debriefings, novice teachers engage in the full scope of ESL teaching activities. They plan and deliver lessons, assess learners and their language development, and conduct managerial tasks and other appropriate duties.
Prerequisites: EESL 697 [Min Grade: C]

EESL 717. Teaching English in Global Context. 3 Hours.
This course provides a sociolinguistic perspective on the globalization of English and on the emergence and teaching of English as an International Language. Students explore dialectology, language change, language diversity, language ideology and power, national language policies, World Englishes, the growing number of non-native English speakers, and attitudes of native and non-native English speakers toward the domination of English.

EESL 737. Teaching English as an International Language. 3 Hours.
The primary purpose of this course is to guide educators in exploring the teaching of English as a second, new, or foreign language to English learners of all ages. With the goal of expanding an educator's repertoire for teaching speakers of languages other than English, this course considers the relevance of historical approaches and methods used in language teaching during the past century and reviews language methods and approaches used in today’s ESL and EFL classrooms. Educators analyze selected methods and approaches in differing contexts that include English as a Second Language (ESL), English as a Foreign Language (EFL), and English as an International Language (EIL) or English as Lingua Franca (ELF).

EESL 743. Promoting Global Peace through TESOL. 3 Hours.
This course guides doctoral students in understanding and facilitating the promotion of global peace within their classroom and educational setting as well as in other settings, both locally and globally.

EESL 747. Instruction and Assessment: Reading and Writing. 3 Hours.
This course explores the linguistic, sociocultural, psychological, and educational factors that affect literacy development in English as a second or foreign language (ESL/EFL). Educators will analyze literacy-learning needs of English learners (ELs) in diverse contexts and multiple age groups and will participate in effective and engaging ways to meet those needs.

EESL 757. Instruction and Assessment: Listening and Speaking. 3 Hours.
Based on linguistic perspectives and language acquisition research from earlier in their careers, educators will use research, experience, and reflection to further inform their own teaching practice in TESOL. To that end, they will explore the complexities of linguistic, sociocultural, psychological, and educational factors that affect ELLs’ aural and oral development.

EESL 763. Facilitating Intercultural Communicative Competence. 3 Hours.
This course guides doctoral students in understanding and facilitating their students' intercultural communicative competence within and out of the classroom.

EESL 780. Research in ESL/EFL. 3 Hours.
Exploration of research methods conducted in second and foreign language teaching and applications of these methods to inform teaching in the ESL and/or EFL contexts.

Human Studies

Program Contact Information

Program	Coordinator	Room	Phone Number
Community Health and Human Services - Masters	Dr. Larrell L. Wilkinson	EEC 304C	(205) 975-1295
Community Health and Human Servies - PhD	Dr. Retta Evans	EEC 301C	(205) 996-2701
Counseling	Dr. Dayna Watson	EEC 115G	(205) 934-2005
Educational Leadership	Dr. Amy Dagley	EEC 308C	(205) 975-1984
Education Psychology and Research	Dr. Jenna LaChenaye	EEC 316B	(205) 934-2008
Foundations	Dr. Tondra Loder-Jackson	EEC 306C	(205) 934-8304
Higher Education Administration	Dr. Mary Ann Bodine Al-Sharif	EEC 306D	(205) 975-4521
Kinesiology - Teacher Certification	Dr. Sandra Sims	EEC 309C	(205) 996-2721

Kinesiology - Exercise Physiology	Dr. Gordon Fisher	EEC 321C	(205) 996-4114

In addition to degree offerings in Community Health and Human Services, Counseling, Educational Leadership, Higher Education Administration, and Kinesiology, the Human Studies Department provides courses in Educational Foundations and Educational Psychology and Research.

Foundations

The Foundations (EDF) Program examines how educational institutions shape and are shaped by the social and cultural structures within our society. Our mission is to offer a program that examines current teaching contexts and practice, research, and theory with the aim of increasing our professional candidates' knowledge and understanding of the socio-cultural, historical, political, and economic factors, as well as the philosophical underpinnings, that influence education and shape the societies and world in which we live. Within a diverse world, we also believe that professional educators should recognize a profound need to intentionally learn about and incorporate their students' personal experiences, cultures, and community resources into their instruction and programs. It is through our courses that students come to encounter, interrogate, better understand, and embrace the increasingly diverse landscape of our society and P-12 students.

Educational Psychology and Research

At the undergraduate level, the Educational Psychology and Research Program (EPR) provides courses in psychological foundations and measurement and evaluation that are necessary for all prospective teachers to complete who are pursuing an undergraduate teaching degree. We also house the undergraduate Introduction to Statistics that serves the Community Health and Human Services and Kinesiology programs and concentrations.

At the graduate level, we provide educational psychology courses that meet the program requirements for graduate teacher certification programs as well as courses taken for recertification and other Masters, Educational Specialists, and doctoral programs within and outside of the School of Education and Human Sciences. These courses also attract graduate students from programs outside the School of Education and Human Sciences such as Nursing, Public Health, and the School of Health Professions.

AEL-Area Educ Leadership Courses

AEL 602. Advanced Educational Leadership. 3 Hours.
Basic concepts, group interaction on selected presentation of assigned research. Prerequisite: Admission to EdL Doctoral program. 3 hours.

AEL 650. Organizational Theory. 3 Hours.
An exploration of the relationship among concepts, generalizations, and theoretical models in the behavioral and social sciences. The application of these to administrative practice in educational settings is addressed.

AEL 671. Survey of Instructional Supervision. 3 Hours.
A critical examination, interpretation, and evaluation of significant current and classical writings in the field of instructional supervision with particular emphasis on research findings, the emergence of instructional supervision perspectives, issues, and controversies across the literature, and applications for supervisory practice and instructional leadership roles.

CHHS-Comm Hlth Human Serv Courses

CHHS 526. Wellness Promotion Peer Educators Part 1. 3 Hours.
The intent of this course is to provide students will the skills to facilitate group presentations on health-related content to their peers. Students will complete the Certified Peer Education Training a comprehensive, interactive, and skills-based training. Students will learn about the programs and services offered at the UAB Student Health and Wellness Center and will be able to articulate this to new student users. Students will learn basic alcohol and other drug information in preparation for presentation to their peers.

CHHS 527. SHAPE Peer Education. 3 Hours.
This course is designed to provide students with the knowledge and skills needed to effectively communicate accurate information related to sexual health and decision-making. The concept of total health and the effects of lifestyle and decision-making on the quality of life will be emphasized.

CHHS 528. Wellness Promotion Peer Education Part 2. 3 Hours.
This course involves course involves students active engagement in the delivery of peer education programs and services to the UAB campus community. The purpose of the Wellness Promotion Peer Education Part 2 course is to provide candidates with a supervised, field-based, work experience in a wellness promotion setting.
Prerequisites: CHHS 426 [Min Grade: C] and CHHS 526 [Min Grade: C]

CHHS 598. Lifespan Dimensions in Women's Health and Nutrition. 3 Hours.
Highlights will include health issues specific to women, chronic diseases, body image and eating disorders, health promotion and disease prevention, pregnancy, childbirth and lactation, weight loss/maintenance, menopause and ageing, fitness management and stress management.

CHHS 601. Current Readings in Health Education. 1-3 Hour.
Review of literature in health education. Development of annotated bibliography pertinent to professional practice.

CHHS 602. Advanced Principles of Mental Health, Stress, & Well-being. 3 Hours.
This advanced course explains how an individual can manage their internal and external stressors to optimize their mental and emotional well-being. Topics span the discipline of health promotion and wellness, including theoretical models, discussions on the importance of relationships and social support, personality differences and risk of disease, how attitudes and emotions can change body chemistry, heart rates, hormone levels, and immunity against disease.

CHHS 606. Advanced Issues of Disease Prevention in Health Education/Promotion. 3 Hours.
This is an introductory course designed to teach graduate-level health promotion students, the basic principles, methods, and applications of epidemiology and issues in disease control.

CHHS 608. Advanced Principles of Substance Abuse Prevention and Education. 3 Hours.
This course provides an advanced discussion of major drug classifications and their effects, behavioral theories giving explanation to substance use, societal norms, and different pathways of addiction. Prevention strategies, intervention modalities, and treatment options are explored within the context of the community health and human services professions.

CHHS 610. The Advanced Health Education/Promotion Specialist. 3 Hours.
This course emphasizes application of advanced Health Education/ Promotion competencies corresponding to the Master Certified Health Education Specialist. Topics include the significant historical contributions, application of theories and planning models, advanced professional ethics, advanced administrative tasks, advanced literature reviews, and emphasis on advanced levels of health communication and advocacy.

CHHS 611. Interdisciplinary Approaches to School Health Education/Promotion. 3 Hours.
This course is designed to provide students with a fundamental knowledge base on contemporary issues related to school health programs; national, state, and local factors influencing school health programs; importance of collaboration between school administration, teachers and parents. The Whole School, Whole Community, Whole Child Model (WSCC) will be a reference point for class discussion.

CHHS 612. Student Health and Well-Being in Higher Education. 3 Hours.
This course prepares higher education professionals to understand and address wellness and health promotion issues contributing to students' overall success, academic performance, retention, satisfaction, and quality of life. Application of student health concerns in an urban campus context can guide those working in a variety of student affairs and higher education settings not limited to: residence halls, orientation, student leadership, advising, multicultural programs, and other areas of student development.

CHHS 618. Lifespan Dimensions in Women's Health and Nutrition. 3 Hours.
Highlights will include health issues specific to women, chronic diseases, body image and eating disorders, health promotion and disease prevention, pregnancy, childbirth and lactation, weight loss/maintenance, menopause and aging, fitness management and stress management.

CHHS 621. Advanced Health Communications in Health Education/ Promotion. 3 Hours.
This course promotes skills appropriate for selected health problems, problem solving, and referrals. It also promotes skills to enhance communication with clients, peers, and community members at large. Health-related theories, communication theories, and marketing strategies are discussed in this course.

CHHS 623. Sexuality Education: Theory and Practice. 3 Hours.
This course provides an advanced review of biological, sociological, psychological, and ethical aspects of human sexuality as encountered by health education specialists and human services practitioners. Content related to an anatomical overview, sexual decision-making process, harm reduction approaches, social norms, societal issues, gender stereotypes, sexual complications, and the sexuality of special populations are emphasized.

CHHS 624. Advanced Health Coaching in Health Education/ Promotion. 3 Hours.
This course promotes mobilizing the strengths and resources of individuals, peers, and the community at large to develop strategies for adopting healthier lifestyles. Health coaching emphasizes specialized methods to support clients, which includes referrals, problem solving, goal setting, creation of action steps, and accountability.

CHHS 626. Student Health and Wellness Center Peer Educators. 3 Hours.
The intent of this course is to provide students with the skills to facilitate group presentations on health related content to their peers. Students will complete the Certified Peer Education Training, a comprehensive, interactive, and skills-based training. Students will learn about the programs and services offered at the UAB Student Health and Wellness Center and be able to articulate this to new student users. Students will learn basic alcohol and other drug information in preparation for presentation to their peers.

CHHS 631. Applied Planning and Implementation of Health Education/Promotion Programs. 3 Hours.
Content and process planning and implementing programs in health education and health promotion. Sociological, psychological, and epidemiological foundations of health promotion programs. Development of practical skills for school, occupational, clinical, and community settings. A comprehensive program planning assessment will reinforce quantitative literacy in the profession. Quantitative Literacy is a significant component of this course.

CHHS 632. Advanced Administration of Health Education/Promotion Programs. 3 Hours.
This course focuses on issues related to the advanced practice of administration and management of health education/promotion programs. Topics include leadership theory and development, staff development and training, ethical issues and human resources, fiscal responsibility, and emphasis on data driven decision-making.

CHHS 640. Content Issues I. 3 Hours.
The content issues course allows the student to explore a topic, of his/her choice, in depth. The resulting document(s) must be thorough including a detailed, complete review of historical and current literature related to the topic.

CHHS 641. Content Issues II. 3 Hours.
The Content Issues II course allows a student to build upon information gathered in Content Issues I or can be developed as a new project. A general outline is provided below. Identification of the health issue or problem Description of who is being affected (including their risk factors) Discussion of national, state, and local initiatives and interventions aimed at reducing the problem and/or risks.

CHHS 642. Applied Behavioral Theory and Health Education/ Promotion. 3 Hours.
This course provides students with a better understanding of how to use health behavior theory in guiding health behavior change. The student will examine theories and models that assist in increasing healthy behaviors of youth and adults of all ages.

CHHS 662. Advanced Worksite Health Education/Promotion. 3 Hours.
This course emphasizes the interrelationship of intervention planning, methodology, and the selection and use of teaching aids, and methods or materials to be use in the worksite setting. Special problems associated with health interventions are discussed.

CHHS 689. Intervention Strategies for Health Education/Promotion. 3 Hours.
The purpose of this course is to present the interrelationship of intervention planning to promote health behavior change and the selection and use of teaching aids, methods and materials to facilitate helping relationships. Special problems associated with health interventions are discussed. Students will learn ethical, theoretical and practical aspects of health education, teaching techniques, curricular development, organization skills and techniques.

CHHS 691. Special Topics in Health Education. 3-6 Hours.
HE 691 is offered to advanced students who display a high level of commitment to their studies, willingness to work flexible hours, a desire to become involved in research and training, and the ability to work independently under faculty supervision. At least 4 goals will be accomplished during this semester: 1. To complete a review of professional literature related to educator's knowledge of, and response to body dysmorphic disorders; 2. To prepare a detailed summary of the Steps to a HealthierUS fitness and nutrition initiative; 3. To offer technical assistance to staff and volunteers of the Steps to a HealthierUS – River Region consistent with the logic model and Year Two Community Action Plan aimed at goal achievement; 4. To prepare an objective typewritten summary of accomplishments completed in this course during the semester.

CHHS 692. Supervised Research in Health Education. 3-6 Hours.
CHHS 692 is offered to advanced students who display a high level of commitment to their studies, willingness to work flexible hours, a desire to become involved in research and training, and the ability to work independently under faculty supervision.
Prerequisites: EPR 608 [Min Grade: C] or EPR 609 [Min Grade: C]

CHHS 693. Capstone Experience in Community Health. 3-6 Hours.
The internship experience is designed to enhance the student's skills in planning, implementing, and evaluating health promotion interventions.

CHHS 696. Ethical Problems and Principles in Health Education/ Promotion. 3 Hours.
This course is designed to provide students with opportunities to review and discuss case studies involving ethical decisions.

CHHS 697. Community-Based Approaches to Evaluation and Grantsmanship of Health Education/Promotion Programs. 3 Hours.
This course enhances knowledge, competencies and skills required to obtain funding and to evaluate community-based health education/ promotion programs for defined health issues. The course emphasizes elements of evaluating community-based intervention activities at macro-levels including determining needs and assets, writing realistic goals and measurable objectives, incorporating quantitative and qualitative data, and evaluating behavior change at the community level. The course also focuses on grant preparation, including topics such as engaging funders, establishing grant need, planning grant activities, creating a budget, and program sustainability.
Prerequisites: CHHS 610 [Min Grade: C] or HE 610 [Min Grade: C]

CHHS 698. Lifespan Dimensions Women. 3 Hours.
Highlights will include health issues specific to women, chronic diseases, body image and eating disorders, health promotion and disease prevention, pregnancy, childbirth and lactation, weight loss/maintenance, menopause and ageing, fitness management and stress management.

CHHS 699. Thesis Research. 1-3 Hour.
Research and completion of the thesis.
Prerequisites: GAC M

CHHS 730. Special Topics in Health Education. 3-6 Hours.
Special Topics in Health Education.

CHHS 731. Advanced Theoretic/Scientific Basis of Health Education/ Promotion. 3 Hours.
This course facilitates integration, application and evaluation of specific information regarding health education and health promotion theory, research, and practice. This course will guide analysis of current issues in health science specifically those related to behavior change. Health behavior theories are emphasized.

CHHS 732. Advanced Planning and Implementation of Health Education/Promotion Programs. 3 Hours.
This course emphasizes content and process of advanced planning and implementation of health education/promotion programs. Advanced topics include application of the Precede-Procede Model to multiple health issues; application of health behavior theory; examination of advanced program evaluation measures; and advanced constituent engagement.

CHHS 733. Evaluation of Health Education/Promotion Programs. 3 Hours.
This course provides the graduate health education student with the competencies, knowledge and skills to plan and to implement an evaluation of health promotion-disease prevention intervention for a defined population at risk.

CHHS 734. Health Education Seminar I. 1 Hour.
Seminars introduce doctoral students to various topics related to professionalism.

CHHS 735. Health Education Seminar II. 1 Hour.
Seminars introduce doctoral students to various topics related to professionalism.

CHHS 736. Health Education Seminar III. 1 Hour.
Seminars introduce doctoral students to various topics related to professionalism.

CHHS 740. Evaluation and Research Methods in Health Education/ Promotion Programs. 3 Hours.
This course promotes understanding at the doctoral level of the knowledge, competencies and skills required to plan a research approach and evaluation strategy for health education/promotion research programs for defined health issues among specific audiences. The course emphasizes elements of evaluating community-based research and intervention activities at micro- and macro-levels including examining previous published literature, writing specific aims and measurable objectives, incorporating quantitative and qualitative data, evaluating behavioral impacts, and assessing health outcomes. The course also focuses on federal grant preparation, including topics such as engaging funders, using federal grant formatting, creating a grant budget, and assessing research impact.

CHHS 742. Health Disparities in Diverse Populations. 3 Hours.
This course is designed to provide students with a fundamental knowledge base on contemporary issues related to health, disparities in health outcomes and social determinants of health. It is intended to provide students with a broader understanding of the structural and psychosocial factors related to health disparities. To do so, the course will focus on theoretical frameworks that draw on an ecological perspective and examine how factors associated with families, peers, schools, neighborhoods, and communities influence health.

CHHS 798. Supervised Research in Health Education/Promotion. 1-6 Hour.
The purpose of this course is for students to engage in meaningful research and writing activities.

CHHS 799. Dissertation Research. 1-12 Hour.
Design and completion of the dissertation.
Prerequisites: GAC Z

ECG-Counseling, Human Services Courses

ECG 600. Intro to Integrated Care Counseling. 3 Hours.
Integrated care capitalizes on the combined expertise of mental health and primary care providers working together within a single treatment setting to more effectively address the physical health problems of individuals suffering from mental illness. Within these settings mental health counselors work collaboratively with health care professionals to design and implement comprehensive biopsychosocial treatment plans. This course addresses the specific needs of students preparing for contemporary counseling careers in both primary care and behavioral health settings, including the multi-faceted roles and functions of a professional counselor, the counseling needs of special community populations, and the professional/ethical issues unique to integrated care counseling.

ECG 605. Introduction to Employee Assistance Counseling Programs. 3 Hours.
Employee Assistance Counseling Programs or Employee Assistance Programs (EAPs) provide counseling, assessment and services to address personal problems and work-related concerns that hinder employees' well-being, work productivity, and job performance. EAPs may assist employees with mental health and substance use disorders, relationship issues, financial and legal problems, and eldercare. In addition, EAPs provide resources and referral information, psychoeducation, supervisor consultation and work-site trainings. EAP services are typically an employer sponsored benefit provided at no cost and counseling and referrals may be delivered by telephone, in-person or through video-conferencing technology. The primary aim of this course is to provide a comprehensive overview of EAPs and EAP service delivery in the United States. This course will cover the history of EAPs in addition to program design, EAP-related legislation, and ethical considerations.

ECG 612. Professional Orientation. 3 Hours.
This course emphasizes an understanding of professional roles and responsibilities; ethical and legal issues; historical perspectives; preparation standards; credentialing; trends and issues in the counseling profession. Central to this course will be an on-going self-evaluation of the student's attitudes, values, interpersonal skills, and motives for choosing counseling as a potential profession. Threaded throughout the course will be the concept of the counselor as a social change agent and advocate for clients, the community, and the counseling profession. This course is open to Non-Degree seeking students.

ECG 613. Foundations of Substance Abuse. 3 Hours.
The foundations of Substance Abuse course is an introductory overview of relevant theory, research, and practice associated with substance abuse and addictions counseling. The course will be presented as a blend of didactic and practical elements to increase student knowledge of fundamental concepts while providing opportunities to experiment with approaches to working with clients presenting with substance abuse and /or addictions concerns. To that end, the instructor will introduce topics that include pharmacological issues and terminology, models of addiction, theories on etiology, diagnosis and assessment, and evidence based treatment strategies. A practicum element that requires students to practice the introductory concepts of Motivational Interviewing will accompany lectures, group discussion, case studies, and demonstrations over the course of the semester. This course is open to Non-Degree seeking students.

ECG 616. Motivational Interviewing. 3 Hours.
Motivational Interviewing (MI) is an approach to behavior change designed to enhance intrinsic motivation by exploring and resolving ambivalence within the client. This course will introduce the underlying philosophy of MI, as well as the key MI principles, concepts, and "active ingredients" that make MI successful in a variety of settings with a variety of populations. Emphasis will be placed on instruction of the four fundamental processes of MI, engaging, focusing, evoking, and planning; MI interventions, treatment fidelity, short-term models, responding to discord between practitioner and client, and developing change plans. The instructor will provide supervision and feedback of MI practice for all enrolled students. Though the course will be fully taught online, the instructor will evaluate students based on their presentation of the skills of MI.

ECG 619. Special Issues for School Counselors. 3 Hours.
This course will expose the school counselor-in-training to a variety of critical incidents. These incidents (situations) will cover a variety of experiences which will be presented in a seminar environment and will require the student counselor's expertise and proper response. Authorities from the various school systems, law enforcement agencies, counseling/ mental health agencies, and child protective agencies will provide knowledge and insight from their perspectives.

ECG 620. Foundations of School Counseling. 3 Hours.
Social, psychological, economic, and philosophic trends leading to development of guidance programs in American schools. Organization and administration of guidance services. This course is open to Non-Degree seeking students.

ECG 621. Theories of Individual Counseling. 3 Hours.
Students will be provided an introduction to counseling theories. Students will explore beliefs about different approaches and methods of counseling including, educational, vocational, systemic, and personal counseling.

ECG 623. Comprehensive Counseling and Guidance: M/H School. 3 Hours.
Principles and practices of comprehensive counseling and guidance in the middle/high school related to curriculum, guidance services, and the guidance program.

ECG 624. Assessment. 3 Hours.
The purpose of this course is to provide an introductory overview of assessment methods, instrumentation, and basic principles of measurement. Discussion topics will review techniques for assessing intellectual ability, aptitude/ achievement, psychopathology, emotion, and personality. Additional topics will include clinical assessment, communicating results,multicultural considerations, and ethical/ legal issues. This course will orient students to common instruments used in educational and clinical settings, common selection procedures, measurement methods, administration, scoring, and interpretation.
Prerequisites: EPR 590 [Min Grade: C]

ECG 626. Group Counseling: Process and Procedures. 3 Hours.
This course provides an introduction to many of the important challenges facing group leaders and group members in contemporary society. Ethical guidelines particular to group work will be discussed. Students will be exposed to how common counseling theories can be applied in group settings. Students will gain an understanding of group developmental stages and processes, and how these dynamics influence group growth and productivity. Leader skill development will be emphasized. Approximately 20 hours of class time is spent in a laboratory experience wherein each student is provided the opportunity to function in a group.
Prerequisites: ECG 621 [Min Grade: C](Can be taken Concurrently)

ECG 627. Comprehensive Counseling and Guidance: Elementary School. 3 Hours.
Principles and practices of comprehensive counseling and guidance in Elementary School related to curriculum, guidance services, and the guidance program.

ECG 628. Social and Cultural Diversity. 3 Hours.
This course is designed to expose students to various cultures, and the methods, values, and beliefs that organize family life and human development. Using the oppression model, students will examine how the intersections of race, class, culture, gender, ethnicity and sexuality shape and affect the lives of individuals and families and the therapeutic process itself. Intervention practices, social advocacy models, and resistance strategies will be reviewed.

ECG 630. Career Development: Vocational and Life Planning. 3 Hours.
This course will introduce students to the concepts of career development. The course will present the philosophical and historical foundations of career counseling. Students will learn how to apply career counseling theory to practice. Instruction will include career counseling technique, career assessment, career exploration, job market strategies, examination of workplace issues, and lifestyle and wellness concepts.

ECG 631. Suicide Prevention. 3 Hours.
The course will address the epidemiology of suicide, demographic and incidence information about at-risk groups, risk factors, protective factors, warning signs, assessment of emergency risk and chronic risk, intervention strategies, nomenclature, national strategy planning, prevention advocacy, and attention to the bereaved and complicated mourning and subsequent postvention. Students will be engaged in case studies and assessment exercises, research and review into the literature, hear from guest speakers including advocates and survivors, journal writing and reflection, exams, and presentations. This course is open to Non-Degree seeking students.

ECG 638. Practicum I: Clinical Skills and Techniques. 3 Hours.
The Counseling Techniques course is a forum for the instructor to introduce candidates to the practical skills necessary for development as a counseling professional. Through classwork lecture, discussion and demonstration will be used in the instruction of course material, an emphasis on experimental education will be implemented to encourage growth in candidates' use of counseling skills. Opportunities to integrate counseling skills with counseling and multicultural theory will be afforded throughout the coursework.
Prerequisites: ECG 621 [Min Grade: C]

ECG 650. Diagnosis and Treatment of Psychological Disorders. 3 Hours.
This course will introduce students to the diagnosis, treatment, and conceptualization of mental disorders. First, students will learn about diagnostic classification, models for conceptualizing and treatment planning. Finally, students will receive a broad introduction into psychopharmacological interventions associated with the treatment of mental disorders.

ECG 652. Advanced Counseling Techniques. 3 Hours.
This course will involve the study of theoretical approaches to counseling which have been demonstrated to be culturally-relevant and conceptually inclusive of multiple theories and techniques: Advanced Cognitive Behavioral Therapy techniques will be emphasized (other techniques will also be explored). Selected readings, academic discussion and clinical application will be stressed. Critical thinking and active participation are essential. Students will focus on the application of theoretical information towards a goal of case conceptualizations as a precursor to effective treatment planning.
Prerequisites: ECG 621 [Min Grade: C] and ECG 638 [Min Grade: C]

ECG 653. Counseling Children and Adolescents. 3 Hours.
This course will review current evidenced based treatment interventions for children and families. Candidates will learn play therapy techniques, art therapy techniques, and behavioral interventions including how to create behavioral contracts, and methods for writing informative treatment plans. Candidates will also learn specific strategies for engaging parents and siblings in treatment, and will learn specific structural and narrative based theoretical approaches to family therapy.

ECG 660. Relationships and Human Sexuality. 3 Hours.
Introduction to the theory of human sexuality and considerations of couples therapy will be presented, followed by a discussion of systematic goal setting, treatment planning, and assessment, and an investigation of issues of dysfunctional sexual functioning, sexual disorders, and its effect on couple and family systems. Focus will be given to specific issues to take into account in the practice of systematic couples therapy, including cultural diversity, age, disability and illness, diverse sexual behavior, sexual trauma, and rape. Appropriate assessment and intervention methods, as well as techniques utilizing a contextual and systemic approach will be studied and practiced.

ECG 661. Play Therapy I. 3 Hours.
This course will introduce students to the philosophical underpinnings and theoretical approaches of play therapy with children. During this course, students will learn to appropriately conceptualize mental health in childhood, develop treatment plans, and apply play theory techniques for the treatment of children. Group counseling and incorporating families into play therapy will also be considered.

ECG 662. Play Therapy II. 3 Hours.
Counseling children. Advanced counseling theories and advanced techniques appropriate to working with children are explored. Play therapy is emphasized.

ECG 680. The Intersections of Family and Community Systems. 3 Hours.
This course will examine the interactions and issues that arise between the family system and prominent community and social systems, with a focus on the education system and schools, the medical system and wellness, and mental health. Contemporary issues affecting families in the context of these systems will also be examined. These interactions and issues will be examined through a systemic lens with an emphasis on family strengths and resilience.

ECG 685. Marriage and Couples Counseling. 3 Hours.
This course is designed to introduce students to principles of effective couples therapy while preparing them to critically assess couple relationships. This course will be taught from a systems perspective and will include an overview of models and techniques drawn from evidence based research. This course is designed to blend theory and application. Students in this course will participate in didactic and experiential learning and will participate in simulations and case presentations to further understand clinical aspects of couples therapy.
Prerequisites: ECG 691 [Min Grade: C]

ECG 689. Advanced Family Counseling Techniques. 3 Hours.
This course will serve as an in-depth exploration of limited theories of family therapy, including Emotionally Focused Couples Therapy and Cognitive Behavioral Family Therapy, their more recent expressions within the professional literature, and how to consider them against the standards of evidenced based practice. Conceptual understanding and acquisition of specific treatment skills through direct clinical experiences and reflection/advisory teams will be emphasized. This course is designed to allow students to gain a greater understanding of how these key theoretical approaches and techniques, and advanced systemic concepts, can be applied in marriage and family therapy practice.
Prerequisites: ECG 685 [Min Grade: C] and ECG 691 [Min Grade: C]

ECG 691. Introduction to Couples and Family Counseling. 3 Hours.
The purpose of this course is to provide an introduction to family, systems, and relational therapies. An overview of theoretical concepts and intervention strategies associated with traditional and systemic theories of marriage and family therapy will be provided. This course also provides an examination of how family therapy has been shaped through cybernetics and systems theory.

ECG 692. Independent Readings in Counselor Education. 1-3 Hour.

ECG 695. Practicum II: Supervised Field Experience. 3 Hours.
This clinical course is designed to give students the opportunity to demonstrate basic counseling skills with students/clients at a school or agency and to begin to move toward proficiency. Knowledge and skills developed in previous course work will be applied in the clinical setting. The counselor-in-training is involved in serious counseling interactions with clients. Student counselors recieve feedback and supervision from on-site supervisors, group seminar supervisors, and UAB faculty members. Counselors in-training are assigned to a school, or agency setting for a minimum of 100 clock hours, 40 of the hours must be in direct service with clients. Prerequisites: Completion of Area I Courses, Completion of required personal counseling sessions, a grade of "Pass" on the comprehensive exam, and satisfactory dis-positional evaluations/ successful resolution of a dis-positional letter.

ECG 696. Counseling Internship A. 3 Hours.
The internship provides an opportunity for the student to perform, under supervision, a variety of activities that a regularly employed counselor would be expected to perform in the clinical setting. A regularly employed staff member is defined as a person occupying the professional counseling and clinician's role to which the student is aspiring (school or clinical mental health). The intern is involved in counseling interactions with clients. Interns receive feedback and supervision from their on-site supervisor, group supervisors, and UAB faculty members. Interns are assigned to a school, agency, or rehabilitation setting for a total of 600 clock hours, 240 of the hours must be in direct service with clients. In this course, students will be challenged to become more self-aware of both their professional approach to counseling as well as how they personally influence the therapeutic space. This development will occur primarily via direct feedback from peers, facilitated by the group supervisor, as well as opportunities for personal reflection and individualized feedback from the supervisor. Interns are often unaware that counselor development hinges on one's willingness to explore themselves. The goal of this internship is to push the boundaries of this lack of awareness within a safe and supportive atmosphere and to challenge others to do the same for the benefit of providing our clients with a more authentic representation of ourselves as professional counselors. Interns are always given the opportunity to discuss this in the group setting or on an individual basis as desired.
Prerequisites: ECG 695 [Min Grade: P]

ECG 697. Counseling Internship B. 3 Hours.
The internship provides an opportunity for the student to perform, under supervision, a variety of activities that a regularly employed counselor would be expected to perform in the clinical setting. A regularly employed staff member is defined as a person occupying the professional counseling and clinician's role to which the student is aspiring (school or clinical mental health). The intern is involved in counseling interactions with clients. Interns receive feedback from their on-site supervisor, group supervisors, and UAB faculty members. Interns are assigned to a school, agency, or rehabilitation setting. Each semester of internship, students are required to have at least 300 total hours at their site,120 of which must be in direct service with clients, for a total over two semesters of 600 clock hours, and 240 in direct service with clients.
Prerequisites: ECG 696 [Min Grade: P]

EDF-Foundations of Education Courses

EDF 600. Urban Education. 3 Hours.
An examination of the historical, social, political, and economic factors that shape urban education, as well as its similarities and differences to suburban and rural education, in the United States.

EDF 601. The History of American Curricular Thought. 3 Hours.
An examination of American educational history using primary source documents to provide insight into the evolution of curriculum, policy, and educational practice.

EDF 602. Critical Social Issues in American Education. 3 Hours.
An examination of contemporary social issues facing schools in the United States, from politics and policy, school structure, and curriculum to pedagogical practice. The relationship of the school to society is also addressed.

EDF 606. Social Movements in Education. 3 Hours.
An examination of how the Progressive Education Movement, the Women's Movement, along with other major social movements in recent history have shaped American education. The history of the Civil Rights Movement in Birmingham and its impact on schools, communities, and the lives of educators and students are of special interest.

EDF 616. Comparative Education. 3 Hours.
An examination of the historical, social, economic, political, and cultural forces influencing the structure and function of education in other countries in comparison to education in the United States. Course may be taught as part of a study abroad program.

EDF 620. Culture and American Education: Race Class and Gender. 3 Hours.
An examination of the interlocking influences and socially constructed meanings and understandings of culture, race, ethnicity, social class, and gender in American education.

EDF 691. Special Problems in The Foundations of Education. 3 Hours.
This course covers variable topics addressing critical issues and problems in the educational foundations field. The course may be taught for in-service educator credit in conjunction with special P-12 school/ university collaborative initiatives.

EDF 697. Individual Readings in Foundations of Education. 1-3 Hour.
This course emphasizes individually-guided and research-focused readings in the field of educational foundations.

EDF 698. Individual Research in Foundations of Education. 1-3 Hour.
This course is generally taught in independent study or small seminar formats to guide graduate research in the field of educational foundations.

EDF 700. Urban Education. 3 Hours.
An examination of the historical, social, political, and economic factors that shape urban education, as well as its similarities and differences to suburban and rural education, in the United States.

EDF 701. The History of American Curricular Thought. 3 Hours.
An examination of American educational history using primary source documents to provide insight into the evolution of curriculum, policy, and educational practice.

EDF 702. Critical Social Issues in American Education. 3 Hours.
An examination of contemporary social issues facing American schools, from politics and policy, school structure, and curriculum to pedagogical practice. The relationship of the school to society is also addressed.

EDF 706. Social Movements in Education. 3 Hours.
An examination of how the Progressive Education Movement, the Women's Movement, along with other major social movements in recent history have shaped American education. The history of the Civil Rights Movement in Birmingham and its impact on schools, communities, and the lives of educators and students are of special interest.

EDF 708. Ethical Dilemmas in Educational Administration. 3 Hours.
This course addresses ethical dilemmas in educational administration and leadership. May be taught by both Educational Foundations and Educational Leadership faculty.

EDF 716. Comparative Education. 3 Hours.
An examination of the historical, social, economic, political, and cultural forces influencing the structure and function of education in other countries in comparison to education in the United States. Course may be taught as part of a study abroad program.

EDF 720. Cult and Amer Educ: Race Class and Gender. 3 Hours.
An examination of the interlocking influences and socially constructed meanings and understandings of culture, race, ethnicity, social class, and gender in American education.

EDF 750. Special Problems in the Foundations of Education. 3-9 Hours.
A doctoral seminar on various special problems and issues in educational foundations. May be taken for 3, 6, or 9 credit hours.

EDF 755. Educational Studies in Diverse Populations: Theories of Inquiry. 3 Hours.
This doctoral seminar examines contemporary issues concerning diversity and institutions of education and the various epistemological lenses and theoretical perspectives that can be used to conduct research about culture and human differences as related to educational policy and practice.

EDF 765. Context, Culture, and Policy (CCP) Proseminar. 3 Hours.
This required seminar introduces doctoral candidates in the Educational Studies in Diverse Populations program to the interrelationships among context, culture, and policy. The course provides analysis of educational institutions and initiatives through the lens of geopolitical space, sociocultural studies, and global justice. Specifically, it encompasses the institutional locations (both national and international, and urban, suburban, and exurban) of higher education, P-12 schools, and non-profit and community organizations, in relation to the experiences of diverse populations.

EDF 796. Dissertation Seminar. 3 Hours.
This course provides for supervised research experience under the direction of a graduate faculty member within the School of Education. The topic for an EDF 796 course must relate to the concentration area of Metropolitan Education Studies within the Educational Studies in Diverse Populations (ESDP) doctoral program. This course is only available to students who have been admitted to the ESDP doctoral program. Prerequisite/co-requisite completion of research sequence and prerequisite courses.
Prerequisites: EPR 609 [Min Grade: C](Can be taken Concurrently) and EPR 710 [Min Grade: C](Can be taken Concurrently) and EPR 792 [Min Grade: C](Can be taken Concurrently) and EPR 696 [Min Grade: C](Can be taken Concurrently)

EDF 797. Independent Studies. 3 Hours.
Independent readings under the direction and supervision of EDF faculty. Doctoral status and the permission of the instructor are required.

EDF 798. Individual Research in the Foundations. 3 Hours.
This course is designed for doctoral students to deepen their understanding of selected research topics.

EDF 799. Dissertation Research. 1-12 Hour.
Doctoral research in the Context, Culture, and Policy concentration of the Educational Studies in Diverse Populations doctoral program. A minimum of 12 hours of EDF 799 is required for the PhD program; up to 21 credits of EDF 799 may be taken.
Prerequisites: GAC Z

EDL-Educational Leadership Courses

EDL 601. Foundations of Instr. Ldrshp. 3 Hours.
The purpose of the course is to provide a strong foundation in strengthening knowledge and skills in instructional leadership. The student will be prepared to become an instructional leader who engages the school community in developing a shared mission, vision; will explore various leadership theories and application; and will review the purpose and process of leadership for continuous school improvement. Requires admission to either EDL Master's or Post-Master's Certification program.

EDL 602. Fld Exp: Found of Inst Ldrshp. 1 Hour.
Through observing, participating, and leading field-based experiences, Foundations of Instructional Leadership students will gain practical knowledge and skills needed to be effective school leaders. This course is for master's students in educational leadership and is taken in connection with EDL 601.

EDL 603. Data Driven Decision Making. 3 Hours.
This course prepares the future school leader to effectively use and interpret data in all forms to lead and monitor continuous school improvement. Students will become conversant with strategies and techniques that enhance classroom instruction. The students will lead in a school improvement project, identifying and addressing student achievement gaps. This course is required for all students earning a Master of Arts in Educational Leadership. Other students interested in studying data-based decision making to improve student learning are welcome to enroll.

EDL 604. Fld. Exp. in Data Driven Dec.. 1 Hour.
Through observing, participating, and leading field based experiences, Data Driven Decision Making for School Improvement students will gain practical knowledge and skills in using data and techniques to enhance leadership for learning in a school. This course is required for students earning their Master of Arts in Educational Leadership, but other students interested in studying data-based decision making for a school setting are welcome to enroll.

EDL 605. Residency in Inst. Leadership. 3 Hours.
The purpose of the Residency in Instructional Leadership is to give future instructional leaders authentic experiences in a continuum of observing, participating, and leading in K-12 schools without the distraction of teaching responsibilities or other coursework requirements. Students are required to complete their residency, in a school with children present, over 10 days. Students are required to attend two Residency Seminars during the term. Residency is a requirement for eligibility for Alabama Class A certification in Instructional Leadership.

EDL 606. Supervision/ Ment. Inst. Staff. 3 Hours.
The purpose of this course is to prepare the future school leader to utilize knowledge of human resources to accomplish school and system goals. This involves developing the ability to design and implement effective professional development and facilitate teaching that will impact student achievement. Emphasis is placed on the observation of classroom teachers and developing systematic feedback processes in order to facilitate improvement in classroom instruction. A final unit will assist the future leader in seeking mentoring opportunities.

EDL 607. Fld Exp. in Super / Mentoring. 1 Hour.
Through observing, participating and leading field based experiences, students will gain practical knowledge and skills in implementing staff development, supervision of instructional staff, and creating mentoring opportunities for new teachers and oneself. This class is for students earning their Master of Arts in Educational Leadership.

EDL 608. Org. & Financial Mgt. 3 Hours.
This course is designed to prepare instructional leaders to develop the knowledge and skills to apply financial procedures for public schools in Alabama. An emphasis on strategies to utilize student data as the impetus for allocating financial resources will be part of the curriculum. In addition, students will conduct a technology audit and explore guidelines for creating safe school facilities.

EDL 609. Fld. Exp. in Org & Finc Mgmt. 1 Hour.
Through observing, participating, and leading field-based experiences, students will gain practical knowledge and skills in applying financial procedures, allocating resources and creating safe K-12 schools.

EDL 610. Legal & Ethical Foundations. 3 Hours.
The purpose of this course is twofold: (1) Candidates will give a fundamental knowledge of ethical principles based on the Alabama Educator Code of Ethics and guidelines of the State Ethics Commission and (2) Candidates will gain a working knowledge of legal principles established by local, state, and federal legislatures and judicial requirements.

EDL 611. Fld. Exp. in Legal/Eth Found. 1 Hour.
Through observing, participating and leading field based experiences assigned in EDL 610 Legal and Ethical Foundations of School Leadership, students will gain a working knowledge of legal and ethical principles necessary to employ in K12 school leadership.

EDL 612. Best Prac. Inst. Ldrship. 3 Hours.
The purpose of this course is to prepare instructional leaders who can create positive learning environments for all students. Special emphasis will be placed on using data to assess and improve student achievement. Students will explore the needs of diverse and underrepresented populations, including racial/ethnic minorities, students with special needs, LGBTQ students, and others. Students will also examine legal mandates for providing services to diverse student populations.

EDL 613. Fld Exp in Best Practices for Inst Ldrshp for Diverse Populations. 1 Hour.
Through observing, participating leading field based experiences, students will gain practical experience needed to meet the instructional needs of diverse populations, including racial/ethnic minorities, students with special needs, LGBTQ students, and others. This course is required for all students earning a Master of Arts in Educational Leadership.

EDL 651. Leadership to Promote Ethics and Well-Being. 3 Hours.
The purpose of this course is for candidates to develop a deep understanding of how to promote well-being among P-12 students and teachers in a school setting. Candidates will explore the professional ethics of school leadership which will serve as a guide to understanding and developing a school culture committed to the academic and non-academic well-being of students and the professional well-being of faculty and staff members and other stakeholders in the school context.

EDL 652. Leadership for Student Support. 3 Hours.
The purpose of this course is for candidates to develop a deep understanding of a range of academic and non-academic student support systems. Candidate will research, observe, and reflect on how K-12 schools identify and support student learning through multi-tiered intervention systems for academic learning and behavioral support. Candidates will become familiar with current technology systems designed to support student learning and enhance classroom instruction.

EDL 653. Leading Action Research for School Improvement. 3 Hours.
The purpose of this course is to provide candidates with a strong foundation in conducting evidence-based action research, developing necessary knowledge and skills to promote current and future success and well-being of each student and adult. Candidates will demonstrate an understanding of the elements of a high-quality action research project aimed at identifying, planning, and conducting site-based action research to improve instruction and learning at the school and district levels. The course will address identifying and articulating a problem of practice; reviewing relevant, empirical literature; strategizing and implementing interventions, and collecting and analyzing baseline and post-intervention sources of data.

EDL 654. Survey of Instructional Leadership. 3 Hours.
The purpose of this course is to provide candidates with a strong foundation in instructional leadership, developing necessary knowledge and skills to promote current and future success and well-being of each student and adult. Candidates will demonstrate the ability to lead, design, and implement a shared school mission, vision, values, and process for continuous school improvement. The course will explore various leadership and organizational theories and their application. Candidates will demonstrate capacity to use data to evaluate, design, cultivate, and advocate for a supportive and inclusive school culture.

EDL 655. Systematic Inquiry for School Improvement. 3 Hours.
The purpose of this course is to provide candidates with a strong foundation in planning for continuous improvement for a school. Candidates will develop knowledge, skills, and commitments necessary to evaluate, develop, and implement coherent systems of curriculum, instruction, data systems, supports and assessments for student learning. Focus will be placed on improving management, communication, technology, school-level governance, and operations systems to address the learning needs and well-being of students and adults in the school community.

EDL 656. Supervision & Instructional Leadership. 3 Hours.
The purpose of this course is to prepare the future school leader to utilize knowledge of human resources to accomplish school and system goals. This involves building the school's professional capacity, developing a professional culture of learning, and improving systems for staff supervision, evaluation, support, and professional learning. Emphasis is placed on the observation of classroom teachers and developing systematic feedback processes to promote the success and well-being of each student and adult in the school.

EDL 657. Law & Ethics for School Leaders. 3 Hours.
A core course in educational leadership preparation, this course prepares educators to make decisions based on legal and ethical principles. Candidates learn about the legal framework of public education and evaluate scenarios to consider the legal and ethical implications of decisions.

EDL 658. Leadership for Diversity and Inclusive Education. 3 Hours.
The purpose of this course is to prepare instructional leaders who can develop and maintain supportive, equitable, culturally responsive, and inclusive learning environments for all students. Emphasis will also be placed on developing the ability to engage families, community, and school personnel in strengthening student learning, supportive school improvement, and advocating for the needs of their school and community. Students will explore the needs of diverse and underrepresented populations, including racial/ethnic minorities, students with special needs, LGBTQ students, and others. Students will also examine legal mandates for providing services to diverse student populations.

EDL 659. Residency in Instructional Leadership. 3 Hours.
The purpose of the Residency in Educational Leadership is to give future instructional leaders authentic experiences in a continuum of observing, participating, and leading in K-12 schools without the distraction of teaching responsibilities or other coursework requirements. Students are required to complete their residency in a school with children present over 10 days. Students are required to attend two Residency Seminars during the term. Residency is a requirement for eligibility for Alabama Class A certification in Instructional Leadership.

EDL 661. Simulation in Educational Leadership. 3 Hours.
This is a course designed to provide practice for prospective school administrators in observing teachers in the classroom. Emphasis is placed on developing the skill base of school leaders in observing, note-taking, and providing meaningful feedback to classroom teachers regarding the delivery of instruction and student response. Skills are also developed in assisting teachers in writing their own professional development plans based upon classroom observation.

EDL 700. School and District Resource Allocation. 3 Hours.
This course explores the principles of effective resource management (e.g., financial, human, material, and facilities) for school leaders, with an emphasis on accountability, adequacy, efficiency, and equity and the strategic deployment of human and material resources to address inclusiveness and educational opportunity. Students learn about the U.S. system of school finance, the various approaches to school funding, and examine the mechanisms for funding schools in Alabama. The course provides students with an understanding of legal and ethical issues related to management of school facilities and auxiliary services. Students will learn about decision making and leadership, and the roles of stakeholders in the context of acquiring and managing educational resources.

EDL 704. Educational Law and Policy Development. 3 Hours.
This course examines judicial, legislative, and regulatory law that affect public schools and considers implications for ethical decision making. Furthermore, the processes, responsibilities, and multiple roles in the development of school and district policy will be explored.

EDL 710. Mentoring for Educational Leadership. 3 Hours.
In this course, students will develop their knowledge base and skill sets in mentoring instructional staff in the development of their own practice as classroom instructors. Concepts of mentoring as a key process in professional development of teachers will be examined. Specific mentoring skills and strategies will be emphasized. Studetns will be required to examine current mentoring program goals and processes as well as practice their own skills in mentoring.

EDL 717. Leading Change Through Action Research. 3 Hours.
The purpose of this course is to strengthen knowledge and skills in the areas of effective leadership and systemic organizational change. This course will teach participants the skills and strategies to prepare for and introduce change in their schools through an identified school-based problem solving project. Candidates will be required to lead a collaborative effort of analyzing and applying strategies and quality tools in addressing a school-based problem, preferably one that is impacting student achievement. Course content will include: an introduction to quality tools (TQM), shared decision-making, group processes, effective teaming, and using data to make decisions.

EDL 717L. Field Experience for Leading Change Through Action Research. 1 Hour.
The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 717-L. the Field Experience Course is taken concurrently with the core course.

EDL 718. Essential Skills for Organizational Leadership. 3 Hours.
This course is designed to strengthen knowledge and skills essential to effective leadership in the school setting. Candidates will increase their understanding of and skills in utilizing participatory /shared decision making; using data focused on student learning to drive the decision making process; communicating high expectations for student learning; and enhancing human resource development. Candidates will demonstrate the ability to analyze various situations involving community and stakeholder relationships through the structural, human resource, political, and symbolic frames and devise appropriate courses of action based on this analysis of school programs.

EDL 718L. Field Experience for Essential Skills for Organizational Leadership. 1 Hour.
The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 718-L. The Field Experience Course is taken concurrently with the core course.

EDL 719. Mentoring & Coaching Skills for School Leaders. 3 Hours.
In an era of ensuring highly qualified teachers through embedded, research-based staff development, the role of supervision and mentoring has taken on an unprecedented role in successful schooling. Supervision and mentoring are at the ¿heart¿ of schooling. In addition, future school leaders need to understand their own mentoring needs, and be comfortable with seeking a mentor for themselves. In this course, candidates will conduct a comprehensive critical examination of mentoring concepts, both for personal development and for instructional supervision of classroom teachers. The skills of supervision through cognitive coaching will be learned and practiced. Implications for individual and group development and the improvement of instruction are emphasized. The field experience, EDL 719L will involve candidates seeking a mentor for themselves, as well as engaging in mentoring a new teacher.

EDL 719L. Field Experience for Mentoring & Coaching Skills for School Leaders. 1 Hour.
The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 719-L. the Field Experience Course is taken concurrently with the core course.

EDL 720. Proposal Writing. 3 Hours.
In this course, students enrolled in the Doctorate of Education program work closely with their course instructor to develop their proposal for dissertation research. The content and structure of the proposal and dissertation are examined, including conducting a comprehensive review of the relevant literature and the techniques and strategies of data collection, analysis, and development of conclusions and implications related to research findings. The anticipated culminating field project is the development and defense of the proposal for doctoral dissertation research.

EDL 725. Current Issues and Problems in School Administration. 3 Hours.
This is a seminar type course that explores current issues affecting the profession of school leadership. Various topics of concern will be presented and discussed. Multiple guest speakers with expert knowledge of selected issues may be invited to present in this class. Students will be required to reflect carefully about their own positions relative to select issues and problems.

EDL 727. Leading the Adult Learning Community. 3 Hours.
This course is divided into the following conceptual units: a. Teachers as Adult Learners b. Understanding Adult Learning Theories c. Applying Adult learning Theories to Professional Learning Communities d. Creating Collaborative Teams to support learners e. Shared Leadership to improve academic achievement of diverse learners f. Developing and Utilizing Shared Leadership Strategies The purpose of this course is to prepare candidates with the ability to and the knowledge of skills and strategies required to Lead the Adult Learning community in schools. An in-depth analysis of adult learning theories and strategies to develop shared leadership capacity in school communities will provide the impetus of this course. Candidates will learn about characteristics of adult learners and various theories of how adults learn, develop, and interact in professional learning communities. The second focus of this course is how to develop and implement shared leadership in schools.

EDL 727L. Field Experience for Leading the Adult Learning Community. 1 Hour.
The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 727-L. the Field Experience Course is taken concurrently with the core course.

EDL 728. Management of the Learning Organization. 3 Hours.
The purpose of this course is to strengthen knowledge of and skills in essential management functions within the school or district setting, as noted in specified ISLLC and Alabama Administrative Code Standards. The course will focus on practices and procedures that are vital to the efficient and effective operation of a school or a school district.

EDL 728L. Field Experience for Management of the Learning Organization. 1 Hour.
The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 728-L. The Field Experience Course is taken concurrently with the core course.

EDL 731. Law, Ethics, and Policy for Educational Leaders. 3 Hours.
The purpose of this course is twofold: 1) Candidates will gain a fundamental knowledge of ethical principles based on the Alabama Educator Code of Ethics and the guidelines of the State Ethics Commission. 2) Candidates will gain a working knowledge of legal principles established by local, state, and federal legislative and judicial requirements. Candidates will be able to demonstrate an understanding of legal and ethical principles related to underrepresented populations within the school setting. Candidates will be able to demonstrate a knowledge and application of the ethical principles stipulated in the Alabama Educator Code of Ethics and accompanying legal precepts. Candidates¿ ability to make sound legal and ethical decisions will be enhanced through a better understanding of board policies and politics as well as through reflection on and clarification of personal values and beliefs.

EDL 731L. Field Experience for Law, Ethics, and Policy for Educational Leaders. 1 Hour.
The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school in the area of law, ethics, and policy. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 731-L. The Field Experience Course is taken concurrently with the core course.

EDL 732. Leadership of Special Programs. 3 Hours.
Leadership of Special Programs coalesces the knowledge of and ability to lead special programs within a school site. Candidates will apply leadership skills in developing a comprehensive home school collaborative project and a comprehensive technology integration project. In addition, candidates will develop curriculum which will align state standards unique to career and technical education. Emphasis will be placed on models of communication, problem solving, conflict resolution and team building principles and skills. Focus will also be placed on best practices in the development of community information, networking, public relations, and media. The technology portion of this class will focus on the total integration of technology into a school community.

EDL 732L. Field Experience for Leadership of Special Programs. 1 Hour.
The course is designed to give Ed.S. candidates authentic, practical experience in leading in a school. A minimum of 20 hours of field experience, spent in leadership activities correlating to the core course, at the school site, will be required as the field experience for EDL 732-L. The Field Experience Course is taken concurrently with the core course.

EDL 733. Organizational Behavior. 3 Hours.
Students will have the opportunity to explore historical, organizational, and theoretical foundations of educational leadership including open systems and social systems models. Emphasis will be given to developing student leadership skills and styles in communication, policy formation, negotiation, decision making, distributed leadership, conflict management, and implementation of effective organizational change models to impact organizational culture focused on supporting academic progress and well-being of all students.

EDL 734. Ethical Dimension of Leadership. 3 Hours.
Students will examine ethical theories and frameworks from multiple perspectives and from across cultures and explore the application of ethical theories to professional practice as an educational leader. Students will examine ethical leadership in an educational environment to identify the need for ethical leadership, common traits and characteristics of ethical leaders, and how leaders can apply ethical models to decision making, organizational analysis, and development of an ethical educational culture.

EDL 735. Professional Leadership. 3 Hours.
Provides an overview of key issues related to professional leadership from the perspective of the teacher leader. Special emphasis will be give to the following course themes: Alabama Educator Code of Ethics, ethical and professional conduct, school law and policy, and adult learning.

EDL 736. Leadership and the Learning Spectrum. 3 Hours.
Educational leaders can enhance their abilities to lead effectively, promote positive learning environments, and drive continuous school and organizational improvement. Emphasis will be placed on developing cultural responsiveness in schools, and on engaging stakeholders in the process of school and district improvement in providing equitable and accessible educational services for students. Various leadership and learning theories will be explored and applied to the practice of school district leadership, as well as strategies to impact high levels of professional development and learning for themselves and other educational professionals.

EDL 737. Instructional Supervision & Human Resources. 3 Hours.
An analysis of leadership techniques necessary to produce instructional improvement in educational organizations and of the technical methodology that distinguishes instructional supervision from other positions of school leadership. In addition, examines systems for hiring and retaining and developing instructional and leadership capacity.

EDL 738. Leading Inclusive Organizations and Building Engagement. 3 Hours.
Students will examine community engagement, cultural dynamics, and collaboration among school district stakeholders to foster school quality, student achievement, and parent involvement. Emphasis will be placed on effective communication strategies to develop inclusive school and district cultures in diverse contexts. Students will analyze community-related challenges in schools and formulate strategic solutions and understand the objectives of a robust school community relations emphasis and programming.

EDL 739. Program Evaluation. 3 Hours.
Educators, policy makers, organizational leaders, and stakeholders have an interest in understanding how programs work and how they succeed or fail. This course focuses on the theoretical and practical craft of program evaluation research, with emphasis on evaluation ethics and cultural competency.

EDL 746. Practicum in Instructional Leadership. 1 Hour.
Course required in the Ed.S. program for candidates who completed the Class A Administrative Certification before 2009, before program redesign. The practicum in Institutional Leadership allows for authentic leadership experiences in K-12 schools. The Practicum consists of developing projects and documents /artifacts, throughout the four-semester Educational Specialist Program, that outline leadership experiences in all areas of the Alabama Standard for Instructional Leaders.

EDL 755. Advanced School System Administration. 3 Hours.
An advanced course for practicing school leaders examining the various aspects of leadership of a school district from the level of the principalship and beyond. This course explores systems theory and systems thinking relative to the various systems enacted in the leadership of a school district.

EDL 756. Advanced Educational Law. 3 Hours.
An advanced course for practicing school leaders examining the various aspects and implications of educational state and national level case law and policy governing and related to leadership of a school district from the level of the principalship and beyond.

EDL 775. Leadership Theory. 3 Hours.
An examination of historical and contemporary theories, models, concepts, and practices for effective and efficient approaches to leadership across a variety of disciplines, and how these apply to educational settings.

EDL 776. Advanced Organizational Theory. 3 Hours.
This course focuses on the theoretical assertions and empirical knowledge regarding organizational behavior and its implications for leadership. Systems theory, power and authority, ethics, and culture are addressed, with emphasis on the complexities of the school organization.

EDL 777. Ethics & Policy. 3 Hours.
This is an advanced course designed to equip doctoral candidates with a comprehensive understanding of ethical theories, principles, and frameworks in the context of public policy development and implementation. The course explores the intricate relationship between ethics and policy-making, emphasizing critical thinking, research skills, and the ability to navigate complex ethical dilemmas inherent in various policy domains.
Prerequisites: EDL 734 [Min Grade: B]

EDL 778. Policy Development Theory & Analysis. 3 Hours.
To prepare students to navigate policy processes and influence education policy decisions, this course introduces basic theoretical approaches to studying public policy processes, develops analytic skills in identifying policy problems in education, and requires students to develop communication skills related to policy analysis.

EDL 779. Politics & Education. 3 Hours.
This course examines the politics of the United States education system, past and present, by examining political, social, and economic dimensions shaping education governance and policy initiatives.

EDL 780. Education Finance & Policy. 3 Hours.
This course explores issues in education finance and policy by focusing on the core concepts of the economics of education and applying policy analysis to school finance policy. Students examine the implementation and consequences of school finance policy, budget and policy alternatives, and interactions of school finance policy with other educational policy decisions.

EDL 781. Advanced Education Law & Policy. 3 Hours.
This course examines the relationship between law, policy, ethics, and the U.S. public education system. Understanding school law, drafting model legislation, and advocating for the common good are emphasized in the course.

EDL 790. Special Topics. 3 Hours.
Covers topics in educational leadership, policy, and ethics of immediate or special interest to a faculty member and students. Course varies in content depending on topic. Students may enroll in this course multiple times, but topic may not be repeated. See specific course syllabi for course content.

EDL 792. Directed Study in Educational Leadership. 3 Hours.

EDL 795. Dissertation Seminar. 3 Hours.
In this course, candidates enrolled in the Educational Leadership, Policy, and Ethics (PhD) program work closely with their course instructor to develop their proposal for dissertation research. The content and structure of the proposal and dissertation are examined, including conducting a comprehensive review of the relevant literature and the techniques and strategies of data collection, analysis, and development of conclusions and implications related to research findings. The anticipated culminating field project is the development and defense of the proposal for doctoral dissertation research.

EDL 796. Individual Readings in School Law. 3-6 Hours.

EDL 798. Non-Dissertation Research. 1-12 Hour.
This course is for doctoral students in educational leadership who have completed their preliminary course work but who have not yet attained candidacy (i.e., developed or defended their proposal for doctoral/dissertation research).

EDL 799. Dissertation Research. 1-12 Hour.
This course is for doctoral students in educational leadership who have completed their preliminary course work, passed their comprehensive written exam, and have successfully defended their proposal for doctoral/dissertation research and who, upon the recommendation of their dissertation committee, are entered into doctoral candidacy through the Graduate School. A minimum of 12 hours of EDL 799 is required for the EdD program.
Prerequisites: GAC Z

EPR-Educational Psychology Courses

EPR 510. Measurement and Evaluation in Education ECE. 3 Hours.
For early childhood/elementary education majors only. Basic concepts and principles of measurement and evaluation of personal and academic progress in classroom. Elementary descriptive statistics and measurement techniques used in student evaluation. Quantitative literacy is a significant component of this course (QEP).
Prerequisites: EEC 600 [Min Grade: C](Can be taken Concurrently)

EPR 511. Measurement and Evaluation in Education Secondary Ed. 3 Hours.
For secondary education majors only. Basic concepts and principles of measurement and evaluation of personal and academic progress in classroom. Elementary descriptive statistics and measurement techniques used in student evaluation. Quantitative literacy is a significant component of this course (QEP).

EPR 590. Research & Prgm Eval in Coun. 3 Hours.
This course will provide an introduction to major principles, strategies, and instruments in social science research and program evaluation. Students will become familiar with (1) basic strategies used to conduct research; (2) basic methodology for collecting and interpreting data typically reported in counseling; (3) basic conventions for published reporting research in his/her field of interest; (4) basic program evaluation; and (5) the knowledge and skills to become consumers and producers of counseling research.

EPR 594. Introduction to Educational Research Design. 3 Hours.
Introduction to educational research design purposes and characteristics of the research process, including: types of research approaches and research design; procedures for collecting; analyzing and evaluating data; critical review of published research; research ethics; and institutional review.

EPR 596. Introduction to Qualitative Methods in Educational Research. 3 Hours.
The purpose of this course is to provide a practical introduction to qualitative research and its application in education, social, and behavioral sciences.
Prerequisites: EPR 594 [Min Grade: C]

EPR 607. Computer Applications to Statistical Analysis. 1 Hour.
Excel and SPSS will be used for statistical analyses and data interpretation. Lab to accompany EPR 608.

EPR 608. Introduction to Statistical Methods in Educational Research. 3 Hours.
This statistics course will cover descriptive and inferential statistics to include the following: measures of central tendency; measures of variability; frequency distributions; normal curve; probability; sampling; regression; hypothesis testing; and analysis of variance. Excel and SPSS will be used for statistical analyses and data interpretation.

EPR 609. Statistical Methods and Research in Education: Intermediate. 3 Hours.
This course will cover basic inferential techniques including hypothesis testing and parametric and non-parametric techniques related to factorial ANOVA and within-subjects ANOVA designs. A significant focus of this course is on assumptions, rationale, application and interpretation of various analysis of variance techniques.
Prerequisites: EPR 608 [Min Grade: C]

EPR 610. Child Psychology. 3 Hours.
This course covers human development through infancy, preschool, and preadolescence.

EPR 611. Adolescent Psychology. 3 Hours.
This course offers an in-depth examination of selected topics in the psychological, social, emotional, moral, cognitive, cultural and physical development of adolescents and how these aspects affect classroom and school behavior.

EPR 614. Lifespan Human Development. 3 Hours.
The objective of this course is to further students' knowledge of human development, the multidisciplinary study of how people change and how they remain the same over time. Topics to be covered will include developmental theories, biological development, social developing, language development, cognitive development, young adulthood, and aging.

EPR 622. Learning Theories. 3 Hours.
This course covers the application of learning theories to educational practice, behavioral theories, information processing, biochemical basis of memory and learning, as well as other major learning theories.

EPR 688. Seminar on Current Issues: Measurement/Eval School. 3 Hours.
This course provides advanced training on current issues, policies, and methods in educational measurement and evaluation relevant to classroom teachers.

EPR 691. Independent Readings in Educational Psychology and Research. 3 Hours.
Independent Readings in Educational Psychology and Research.

EPR 692. Introduction to Educational Research Design. 3 Hours.
Introduction to educational research design purposes and characteristics of research process, types of research approaches and research designs, procedures for collecting, analyzing and evaluating data, critical review of published research, research ethics and institutional review.

EPR 695. Survey Methods in Educational Research. 3 Hours.
Provides an overview of the basic principles, applications, and types of survey research in education. Students completing this course should have basic knowledge of the survey implementation procedures, use of appropriate sampling techniques and principles of survey instrument construction. Students should be able to develop reliable survey items, establish reliability and validity of survey scales and instruments, and demonstrate awareness of ethical issues related to conducting survey research. Finally, students will learn how to evaluate and critique published survey research studies.
Prerequisites: EPR 594 [Min Grade: C] and EPR 608 [Min Grade: C]

EPR 696. Qualitative Research: Inquiry and Analysis. 3 Hours.
The purpose of this course is to provide an in-depth insight into the history, philosophy and applications of qualitative research. The course provides a structured field experience of designing and conducting a qualitative small-scale research study within a select qualitative approach.
Prerequisites: EPR 594 [Min Grade: C] and EPR 596 [Min Grade: C] (Can be taken Concurrently)

EPR 700. Data Based Decision Making. 3 Hours.
Provides an overview of key issues related to data-based decision making for students who are interested in moving into leadership positions within their own school and school system. Issues such as Response to Intervention (RTI), progress monitoring, formative and summative evaluation, basic statistical and measurement issues, and other related topics are introduced and discussed.

EPR 700L. Field Experience/Data Based Decision Making. 1 Hour.
Field-based experience to accompany Data Based Decision Making.

EPR 700R. School Based Problem Research Project/Data Based Decision. 1 Hour.
Action-research project to accompany Data Based Decision Making.

EPR 710. Computer Applications and Advanced Statistical Methods. 3 Hours.
Provides an overview of multivariate analyses including multiple regression, MANOVA, logistic regression, discriminant function analysis, factor analysis, cluster analysis, and related procedures. The course focuses on conducting analyses, interpreting results, and conducting studies that require multivariate analyses.
Prerequisites: EPR 608 [Min Grade: C] and EPR 609 [Min Grade: C] (Can be taken Concurrently)

EPR 792. Mixed Methods Approaches to Educational Research. 3 Hours.
This course will provide an overview of mixed methods research, including the history and philosophy of mixed methods research, relevant emerging literature, types of research problems addressed, types of mixed methods designs, and the writing and evaluation of mixed methods studies.
Prerequisites: EPR 594 [Min Grade: C] and EPR 596 [Min Grade: C] (Can be taken Concurrently) and EPR 608 [Min Grade: C] and EPR 609 [Min Grade: C](Can be taken Concurrently)

EPR 793. Doctoral Seminar in Research Evaluation and Design. 3 Hours.
Doctoral seminar in educational research and psychology. Topics vary by semester.

HEA-Higher Education Admin Courses

HEA 600. Administration of Higher Education. 3 Hours.
This course reviews the history, philosophy, and development of higher education through an overview of American and international institutions of higher learning. Students examine organization, governance, and administrative structures of American universities and are introduced to the function and responsibilities of major administrative divisions of a college or university and the major tasks of administration. Students are introduced to major journals in the field and discuss curricular, administrative, and policy issues as well as future trends. Students are required to familiarize themselves with one or more administrative offices on a campus.

HEA 610. History of Higher Education. 3 Hours.
This course is an examination of the development of the American system of higher education across 200-plus years – its origin, major characteristics, trends, and distinctive features. The course emphasizes how historical events have unfolded in our culture and in higher education to influence the growth and development of various forms of institutions within the modern American higher education system.

HEA 620. Access & Equity in Higher Education. 3 Hours.
This course introduces students to research, theory, and practice issues surrounding access to college and equity in higher education. Through the integration of relevant information from history, law, interpersonal development, organizational development, and philosophy, students will develop complex, comprehensive understandings of equity and diversity in higher education.

HEA 630. Higher Education Law. 3 Hours.
This course provides an overview of federal and state statutes, as well as case law, relevant to higher education. Students examine legal and ethical issues that confront college and university personnel and explore the legal relationships between the institution and the faculty, the student, and state and federal governments.

HEA 640. Organization, Leadership, & Change. 3 Hours.
Major organizational and leadership theories are examined as students explore their own leadership abilities and the cultural facets of organizational life in universities with special emphasis on improvement opportunities such as strategic planning, values clarification, cultural norms, innovation, process and people integration, key performance indicators, the balanced scorecard and the alignment of human resources systems.

HEA 650. Assessment & Evaluation of Higher Education. 3 Hours.
This course is an examination of the philosophy and practice of assessment and evaluation in higher education with particular emphasis on assessment of programs/services and/or students. The course addresses the use of qualitative and quantitative data in the processes of decision making at all levels within institutions of higher education. Consideration for advanced data collection and analytics, as well as an introduction to facilitating data management are included. Students will gain a better understanding of the importance of assessment in higher education and their role in the assessment process. Therefore, this course is designed to prepare students to conduct an evaluability assessment and assessment design for a real program where they have the potential to provide a program/department with accurate and usable results, as well as actionable next steps.

HEA 660. College Student Development. 3 Hours.
In this course students will have an opportunity to examine various theories of student development in higher education including social, psychosocial, cognitive structural, integrative and more. Students are asked to look not only at the identity development models presented in isolation, but also at the ways in which they intersect and at times, trouble theory due to the multiplicity of an individual's identities. College retention theories, as well as environmental factors in persistence and attainment will be explored. Students will also review and discuss contemporary issues and trends related to providing services to various types of students.

HEA 670. Strategic Partnerships in Academic & Student Affairs. 3 Hours.
This course introduces students to concepts and theories that underlie scholarship and frame practice in academic and student affairs and considers the factors that shape the teaching-learning environment. It is an interactive course. It will examine ways academic and student affairs can develop, increase, and provide resources and support to students across multiple departments to engender personal and professional growth. Special emphasis is given to communication and co-curricular opportunities to provide a richer learning experience through the application of classroom learning to real-world environments, i.e., service-learning.

HEA 680. Practical Issues & Challenges in Higher Education. 3 Hours.
In this course, students will review issues that have informed best practices in higher education in American society, as well as identify current trends and concerns. This course offers in-depth analysis of prevalent issues affecting institutions of higher education including, but not limited to, federal educational policies, the role of faculty, changes in student populations, the funding of higher education, the changing nature of instructional delivery, and student affordability.

HEA 685. Special Topics. 3 Hours.
Topical courses not offered in regular course rotation – e.g., courses by visiting faculty, courses on timely topics, highly specialized courses responding to unique student demand. The Higher Education Administration program offers Special Topics only occasionally and the selection is different every semester. Special Topics courses do not repeat material presented by regular semester courses.

HEA 690. Practicum in Higher Education. 3 Hours.
This course is intended for master's students in higher education as a complement to their core course requirements and as an opportunity for professional development. The broad purpose of this course is to prepare graduate students for professional practice in various higher education contexts. To achieve this goal, this course is designed to help students to link theoretical current issues and administrative challenges to their own professional development and their work (i.e., practice) in a higher education setting.
Prerequisites: HEA 600 [Min Grade: C] and HEA 610 [Min Grade: C] and HEA 620 [Min Grade: C] and EPR 594 [Min Grade: C]

HEA 699. Thesis Research. 1-6 Hour.
The purpose of a thesis research course is to enable a student to develop deeper knowledge, understanding, capabilities and attitudes in the context of their program of study. The thesis should be written during the last two consecutive semesters of the program with the final chapters completed in the second course in the Thesis Research course series. The course offers the opportunity for students to delve more deeply into and synthesize knowledge acquired in previous studies. A thesis for a Master of Science in Higher Education Administration should place emphasis on the student's abilities to display knowledge and capability required for independent work within the subject matter.
Prerequisites: GAC M

KIN - Kinesiology Courses

KIN 500. Organization & Admin of PE. 3 Hours.
This course is designed to provide aspiring educators and coaches with opportunities to enhance their comprehension of challenges and solutions associated with organizing physical education and coaching programs, including traditional sports and eSports, in elementary and secondary school settings.

KIN 508. Adapted Physical Education. 3 Hours.
This methods course provides knowledge and skills for assessing, interpreting, programming, and instructing K-12 students with disabilities in physical education. Topics include the law, inclusion, IEP writing, differentiation, modifications, instructional delivery, and generalities of specific disabilities. The course will engage students through lecture, peer teaching, and problem-based learning activities. Best practices teaching children with disabilities will be applied through clinical experiences in select schools.

KIN 509. Assessment in Physical Education. 3 Hours.
This course emphasizes the development, implementation, and analysis of assessments within K-12 physical education programs, including assessment of the cognitive, physical, and psychomotor domains including program assessment.

KIN 511. Elementary School Physical Education. 3 Hours.
This course will include the nature and content of a developmentally appropriate elementary physical education program.

KIN 511L. Educational Dance & Gymnastics. 1 Hour.
This course will provide candidates with the knowledge and skills required to teach the key elements for various dance and gymnastics routines. Candidates will demonstrate their own proficiency and their ability to teach dance and gymnastics to elementary aged students.

KIN 520. Fitness and Motor Skill Acquisition. 3 Hours.
This course will enable candidates to acquire the knowledge and the skills necessary to analyze and appropriately teach motor skills and design developmentally appropriate fitness activities for secondary school students.

KIN 520L. Sport Skill Proficiency. 1 Hour.
This course will enable candidates to acquire the knowledge and the skills necessary to teach the critical elements needed to perform all basic sport skills. Candidates will demonstrate skill proficiency in the sport skills as well as the ability to teach others to perform the skills.

KIN 523. Techniques of Teaching Fitness and Nutrition in Schools. 3 Hours.
This course will enable candidates to learn techniques and strategies for teaching fitness and nutrition in physical education programs.

KIN 530. Introduction to eSports. 3 Hours.
This course provides a comprehensive exploration of eSports, covering its historical development, cultural significance, and economic impact. Students will analyze the factors that have propelled eSports to become a dominant sports phenomenon, including technological advancements, online platforms, and streaming services. They will compare eSports to traditional sports, examining controversies, challenges, and opportunities for integration within the sports ecosystem. Additionally, students will investigate the role of eSports in educational institutions and professional settings exploring structures organizations and career opportunities.

KIN 531. eSports in Action. 3 Hours.
This course immerses students in the world of competitive gaming. Through gameplay and analysis, students will develop critical thinking and problem-solving skills, making strategic decisions and adapting to dynamic situations. They will evaluate the game's met, understanding player roles and archetypes. Teamwork and communication will be emphasized, enabling students to coordinate with teammates and make quick decisions.

KIN 555. eSports Management. 3 Hours.
This course introduces students to fundamentals of effective eSports management. Students identify best practices in eSports management by examining case studies of the emerging eSports industry and associated stakeholders. Students explore financial, legal & ethical, governance, marketing, sponsorship, and operational issues surrounding the eSports industry.

KIN 585. Advanced Exercise Testing and Prescription. 3 Hours.
This course studies participant screening, risk stratification, and exercise assessment/testing and prescription for apparently healthy, special and diseased populations.

KIN 589. Physical Education Instructional Strategies. 6 Hours.
This course will focus on information to help potential physical educators attain teaching skills and knowledge necessary to design, implement and evaluate developmentally appropriate K-12 physical education programs. Students will gain hands-on teaching experience with students in school settings.

KIN 601. Introduction to Sports Administration. 3 Hours.
This course will explore the field of sport administration. Students will learn about the many skills needed to be an effective administrator.

KIN 606. Sport Law. 3 Hours.
This course is designed to provide an introduction to basic legal principles and their application to the sport industry, specifically sports at the high school, university and professional levels. This course provides broad strokes of areas of law such as legal procedures, contracts, torts, and constitutional/labor law.

KIN 607. Principles of Coaching. 3 Hours.
This course will explore the principles of coaching regarding sport psychology, sport pedagogy, sport physiology, and sport management.

KIN 615. Sport Facility Planning. 3 Hours.
Principles of planning and managing sport facilities and events.

KIN 630. Mechanical Analysis of Motor Skills. 3 Hours.
Analysis of motor skills in children, youth, and adults.

KIN 631. Foundations of Physical Education. 3 Hours.
Basic foundations of physical education in the school setting.

KIN 632. Supervision of Physical Education. 3 Hours.
Principles of supervising and maintaining a physical education program.

KIN 635. Principles of Management in Sports. 3 Hours.
This course is designed to give students an overview of the duties, responsibilities and problems facing athletic administrators in today's sports-conscious society.

KIN 636. Current Readings in Physical Education. 3 Hours.
This course is designed to assist the student in locating, analyzing, and synthesizing professional literature relative to current trends, issues and research in physical education.

KIN 637. Physiology of Exercise I. 3 Hours.
Advanced study of energy metabolism and cardiovascular, respiratory and skeletal muscle physiology during exercise.

KIN 638. Physiology of Exercise II. 3 Hours.
Advanced instruction on human physiological responses to exercise and exercise training, altitude and climate, and spaceflight.

KIN 639. Exercise Prescription for High Risk Populations. 3 Hours.
Advanced exercise prescription for special populations including cardiovascular disease, obesity, diabetes, cancer and other chronic disease conditions.

KIN 640. Advanced Techniques in Conditioning the Athlete. 3 Hours.
Advanced endurance, resistance, and flexibility training for conditioning the athlete.

KIN 641. Advanced Planning/Management of Fitness Facilities. 3 Hours.
Advanced knowledge and skills needed for successful management, marketing, operational leadership, evaluation, and planning principles of commercial, corporate, clinical, and community health/fitness facilities.

KIN 642. Practicum in Physiology. 3 Hours.
Pre-thesis research.
Prerequisites: (KIN 637 [Min Grade: C] or PE 637 [Min Grade: C]) and (KIN 638 [Min Grade: C] or PE 638 [Min Grade: C])

KIN 643. Curriculum Development in Physical Education. 3 Hours.
This course focuses on the development of curricula in physical education grades K-12. Principles of curriculum development, existing curriculum models and current trends and contemporary issues related to curriculum development are covered.

KIN 644. Application of Exercise Physiology to Fitness and Performance. 3 Hours.
Students in this course will learn the scientific principles that underlie exercise physiology. In this course you will learn about exercise tests to evaluate fitness, and exercise training to promote performance and health, and disease prevention throughout the lifespan.

KIN 645. Advanced Motor Development. 3 Hours.
The purpose of this course is to provide graduate students the opportunity to develop skill and knowledge related to lifespan motor development. Through online discussion, readings, and laboratory activities, students will be exposed to information regarding physical growth, maturation, and aging; motor skill acquisition from infancy through adulthood; perceptual-motor development; physiological changes and exercise over the lifespan; and sociocultural influences on motor development.

KIN 647. Teaching Strategies and Issues in K-12 PE. 3 Hours.
This course is designed to update graduate students who are currently teaching physical education or seeking initial certification regarding new teaching strategies and methodologies as well as current state and national issues affecting K-12 physical education programs.

KIN 649. Advanced Adapted Physical Education. 3 Hours.
This course prepares students to make informed decisions about curriculum and instructional strategies for students with disabilities in physical education settings.

KIN 650. Social Aspects of Sport. 3 Hours.
This course is designed to study sport from a sociological perspective. The course will explore the importance of sports in people’s lives and the sports connection with culture and society.

KIN 651. Issues and Problems in Coaching. 3 Hours.
This course is designed to allow the students to approach issues and problems from a practical perspective, particularly related to legal duties.

KIN 652. Measurement and Evaluation of Athletes. 3 Hours.
This course is primarily designed to help athletic coaches locate, select, and construct quality sport skill tests. Additional attention will be given to body composition, fitness, and psychological assessment of athletes. Students will review reasons why coaches should measure and evaluate athletes, and survey sound testing procedures.

KIN 653. Plan/Conduct Act Prog for Indiv with Disabilities. 3 Hours.
The purpose of this course is to provide students with knowledge and skills needed to meet the unique fitness and physical activity needs of individuals with various disabilities. Through class discussions and course assignments, students will learn to design and implement personal training/fitness programs and disability sports/recreation programs for individuals with disabilities based on assessments of health related strengths and needs.

KIN 655. Motor Learning. 3 Hours.
Principles of teaching and learning motor skills.

KIN 656. Advanced Sport Psychology. 3 Hours.
Psychological principles of sports.

KIN 672. Advanced Treatment of Athletic Injuries. 3 Hours.
Advanced treatment of athletic injuries.

KIN 674. Advanced Sports Nutrition. 3 Hours.
Advanced exploration of nutrient absorption, digestion and metabolism in the athlete prior to, during and following training and athletic competition.

KIN 681. eSports in the Mass Media. 3 Hours.
In this course, students will be able to examine eSport's evolution in the mass media. The course will review the history of eSports, its growth and evolution in modern-day society, and how mass media has played a role in the industry's rapid growth. Additionally, the course will look at the different types of media (social, digital, broadcast, etc.) used in eSports from a branding and marketing perspective. The course will evaluate the impact of media in eSports and the different careers available in the mass media industry.

KIN 690. Seminar in Sports Administration. 1-3 Hour.
Overview of administration of sports programs.

KIN 693. Advanced Field Experience in Physical Education. 3-6 Hours.
Field Experience in Physical Education applying the National Board for Professional Teaching Standards.

KIN 694. Special Projects in Kinesiology. 1-6 Hour.
Special topics course in kinesiology.

KIN 695. Problems in Physical Education. 3-6 Hours.
Development of a project that addresses a current problem in Physical Education with a researched solution.

KIN 696. Elementary/Secondary Physical Education Internship. 9 Hours.
Student teaching provides an opportunity for physical education teacher education candidates to synthesize and apply all knowledge and skills acquired during previous coursework. Interns teach for 15 weeks at two levels, elementary and either middle or high school. The candidates must pass edTPA assessments to receive teacher certification.

KIN 697. Advanced Field Experience in Kinesiology. 1-6 Hour.
Culminating field experience in Kinesiology.

KIN 698. Coaching Internship (Individual Sport). 1-3 Hour.
Culminating internship in coaching.

KIN 699. Thesis Research. 1-6 Hour.
Kinesiology Thesis Research.
Prerequisites: KIN 642 [Min Grade: C]

KIN 710. Special Topics in Physical Education. 3 Hours.
Special topics course in physical education.

KIN 715. Advanced Field Experience in Physical Education. 3-6 Hours.
Within your current teaching environment, demonstrate your teaching practice of the National Standards for Advanced Physical Education Teacher Education.

KIN 718. Practicum in Exercise Physiology. 3 Hours.
Practicum in Exercise Physiology.

KIN 720. Research Design and Methodology. 3 Hours.
Research and design methods in kinesiology.
Prerequisites: EPR 692 [Min Grade: C]

KIN 726. Supervised Research in Physical Education. 3-6 Hours.
Design and implement a research project in the field of physical education.

KIN 728. EdS Thesis Research. 3-6 Hours.
Completion of indepth research in the field of kinesiology.

KIN 729. Physical Education Seminar. 3 Hours.
This course involves the completion of a research project and presentation.

Community Health

For detailed information regarding admission requirements for the School of Education graduate programs, please visit the Admissions Requirements website at https://www.uab.edu/education/home/admissions/.

Overview of Our Programs

The Community Health and Human Services program at UAB is designed to prepare students to work in professional health settings including national/state health organizations, clinical-based programs, and community-based non-profit agencies. In addition to studying contemporary health content, students are guided in the process of assessing community needs, planning, implementing, and evaluating health-related programs and interventions which correspond to the National Commission for Health Education Credentialing professional standards. Students are provided numerous opportunities to practice advanced health education specialist tasks via Instructor lead community-based projects and purposefully designed service learning experiences.

Graduate Certificate in Health Education

The Graduate Certificate in Health Education is designed for students who desire to work in the community or enhance their skills in academia and seek preparation at the graduate level in community health, but not a full master's degree. The Graduate Certificate in Health Education is also designed for students wishing to obtain eligibility for the Certified Health Education Specialist Examination that have a degree in a complimentary field but do not currently have the corresponding coursework. This certificate will formally recognize UAB students and community professionals who have sought out necessary skills and training in community health education. All courses are offered online.

Master of Arts in Education (M.A.Ed.): Community Health (Online)

The Community Health and Human Services program at UAB prepares students for advanced employment opportunities beyond the bachelor's degree level with a M.A.Ed. in Community Health. Work settings include public, volunteer, and private health agencies, community health clinics, hospitals, and worksites. Students gain skills in health education program planning, implementation, evaluation, and administration. Students are provided numerous opportunities to practice advanced health education specialist tasks via Instructor led community-based projects and purposefully designed service learning experiences. Students learn research-based protocol and may choose to complete either a thesis or an internship upon degree completion. Required courses include research design, the advanced health education/promotion specialist, program planning, evaluation, and administration, along with health behavior theory. Course work is aligned with responsibilities and competencies of advanced level health education specialists developed by the National Commission for Health Education Credentialing (www.nchec.org). This program of study has been developed to include the knowledge and competencies needed to prepare students for either the Certified or Master Certified Health Education Specialist (CHES/MCHES) examination.

Masters of Arts in Education (M.A.Ed.): Community Health with a Graduate Certificate in Nonprofit Management (Online)

Through this joint venture between the Community Health and Human Services program and the Department of Political Science and Public Administration, students learn advanced health education programming planning, implementation, and evaluation competencies as well as nonprofit management skills such as grant writing, fundraising, and public service. The program prepares students to lead in non-profit, public health agencies, government roles, and worksites.

M.A.Ed. Admission Process (Online)

Consideration for admission to the master's degree program will occur each Fall and Spring term. The completed application packet must be received by the Community Health and Human Services Program from the Graduate School by the dates shown:

Entry Term	Deadline
Fall	April 30
Spring	October 30

Admission to graduate study in Community Health and Human Services is initiated through the Graduate School and all required materials are to be submitted per specified instructions delineated by the Graduate School. M.A.Ed. applicants should have a cumulative GPA of 2.50. The M.A.Ed. program does not require that student complete the MAT/GRE examination. In rare cases, applicants who do not meet aforementioned standards may be considered for admission.

In addition, applicants must address several questions in writing that reflect the applicant's background, development, pertinent work-related experience, and professional career objectives relating to careers in Community Health. Applicants will also be required to submit a professional resume. All applications for graduate admission are reviewed by the Community Health and Human Services faculty and may be given one of two decisions: a) admit or b) not admit.

Graduate Traineeship in Pediatric Pulmonary Care (with School of Health Professions)

A Graduate Traineeship in partnership with the UAB Pediatric Pulmonary Center (PPC) is offered to a student currently trained as a respiratory therapist. Prospective students are those desiring a graduate degree in Community Health and Human Services; is interested in pediatric pulmonary care; and aspires to positions of leadership. One trainee is selected per year. The traineeship features a combination of planned coursework, hospital rounds, pulmonary clinics, patient and family education, and research experience. This interdisciplinary training program is offered to graduate students in Respiratory Therapy - Community Health and Human Services, nursing, nutrition, social work and medicine. Training is provided in each of the Maternal and Child Health Leadership Competencies. The Traineeship includes a monthly stipend (for up to 12 months) and tuition assistance (limited to U.S. citizens or to individuals with a permanent visa).

For more information go to uab.edu/medicine/peds/ppc or contact: LaShonna Stodghill, MAE, RRT, AE-C, lashonna.stodghill@childrensal.org or Dr. Laura Forbes at ltalbott@uab.edu.

Student Professional Dispositions

Community Health and Human Services faculty individually review the professional dispositions (behaviors and attitudes) of students within each course in accordance with the School of Education's policy and procedure. Additionally, faculty will collectively review student dispositions and overall progress in the program at the end of each semester.

Dispositional areas identified as deficient could result in termination from the program.

Graduate Program Policies

No individual course grade below “C” will be accepted. Each course with an earned grade below “C” must be repeated. Repeating a required health education course more than twice is not permitted. If a student receives a grade lower than a “C” after their second attempt, he or she will be dismissed from the Community Health and Human Services program and not allowed readmission.

Non-Degree Seeking Graduate Students

Following admission to the UAB Graduate School, students may enroll in elective Community Health and Human Services courses as "non-degree seeking" students with the permission of the instructor. Non-degree seeking students are limited to 12 hours of coursework. It is essential for non-degree seeking students to make an advising appointment with a faculty member prior to enrolling in elective courses as some elective courses have pre-/co-requisites. Non-degree seeking students are not permitted to take "core" health education courses prior to admission. Enrolling and passing non-degree seeking coursework does not guarantee admission into a masters or doctoral degree program. Admission criteria (cumulative GPA, recommendations, and written statement) are the primary factors considered when reviewing student suitability for admission to a program.

Graduate Certificate in Health Education

The last decade has seen significant emphasis being placed on the ability of professionals in non-profit, governmental and agency settings to have the skills and training needed to effectively plan, implement and evaluate health related policies and programs. Skills such as grant writing, budgeting, assessing needs of the service population, and using an ecological lens to develop meaningful interventions are only a few of the needed competencies in today’s job market. This certificate is for students who have a desire to work in the community or enhance their skills in academia and want some preparation at the graduate level in health education, but not a full master’s degree. This certificate is also appropriate for those already working in community agencies who want advanced skills and knowledge of how to conduct successful health-related interventions using a community based participatory research approach.

The Graduate Certificate in Health Education is designed for students who have a desire to work in the community or enhance their skills in academia and want some preparation at the graduate level in community health, but not a full master's degree. This certificate will formally recognize UAB students and community professionals who receive the necessary skills and training in community health education. All courses are offered online.

Requirements		Hours
CHHS 631	Applied Planning and Implementation of Health Education/Promotion Programs	3
CHHS 632	Advanced Administration of Health Education/Promotion Programs	3
CHHS 642	Applied Behavioral Theory and Health Education/ Promotion	3
CHHS 697	Community-Based Approaches to Evaluation and Grantsmanship of Health Education/Promotion Programs	3
Choose One of the Following Options		**3**
CHHS 606	Advanced Issues of Disease Prevention in Health Education/Promotion	
CHHS 610	The Advanced Health Education/Promotion Specialist	
CHHS 621	Advanced Health Communications in Health Education/ Promotion	
CHHS 689	Intervention Strategies for Health Education/Promotion	
Total Hours		**15**

Graduate Certificate in Health Coaching

The online Graduate Certificate in Health Coaching prepares individuals to design, conduct, and evaluate clinical and non-clinical health behavior change via wellness-oriented coaching interventions. Students will be provided with the skills needed to conduct individual or small group coaching sessions. Students will also learn the fundamentals of chronic disease prevention and strategies to help improve the health status of coaching clients.

Over the last decade, significant emphasis has been placed on the ability of professionals in non-profit, governmental, agency, and clinical setting to have the skills and training needed to effectively plan, implement and evaluate health interventions. This certificate helps individuals gain those skills to work as health coaches in those organizations or independently.

Students wishing to pursue the health coaching certificate must apply through the UAB Graduate School. A student who has completed the health coaching certificate and would like to apply to the master’s degree program in community health must complete all application requirements as outlined in the UAB Graduate School guidelines. A maximum of four certificate courses may be applied toward the master’s degree once the student has been admitted to the program.

Requirements		Hours
Required Courses		
KIN 607	Principles of Coaching	3
CHHS 624	Advanced Health Coaching in Health Education/ Promotion	3
CHHS 689	Intervention Strategies for Health Education/Promotion	3
Select two from the following		6
CHHS 601	Current Readings in Health Education	
CHHS 602	Advanced Principles of Mental Health, Stress, & Well-being	
CHHS 608	Advanced Principles of Substance Abuse Prevention and Education	
CHHS 621	Advanced Health Communications in Health Education/ Promotion	
CHHS 623	Sexuality Education: Theory and Practice	
CHHS 642	Applied Behavioral Theory and Health Education/ Promotion	
ECG 616	Motivational Interviewing	
EPR 610	Child Psychology	
EPR 614	Lifespan Human Development	
KIN 651	Issues and Problems in Coaching	
KIN 656	Advanced Sport Psychology	
Total Hours		**15**

Graduate Certificate in Health Promotion across the Lifespan

The Graduate Certificate in Health Promotion Across the Lifespan intends to prepare students to address community health concerns from birth

to older adult life. In the recent past, emphasis has been placed on the ability of professionals in non-profit, governmental and health agency settings to have the skills and training needed to effectively implement health interventions for a variety of people groups within diverse settings. Skills such as planning interventions for diverse community groups; providing effective programming in a variety of settings including schools and worksites; assessing needs of the service population; and using a client-centered lens to develop meaningful interventions are only a few of the needed competencies in today's job market.

The Graduate Certificate in Health Promotion Across the Lifespan is a program that consists of eighteen credit hours (6 CHHS courses). All courses can be completed within one academic year.

Requirements		Hours
CHHS 632	Advanced Administration of Health Education/Promotion Programs	3
Select two from the following:		6
CHHS 611	Interdisciplinary Approaches to School Health Education/Promotion	
CHHS 612	Student Health and Well-Being in Higher Education	
CHHS 662	Advanced Worksite Health Education/Promotion	
Select two from the following:		6
CHHS 602	Advanced Principles of Mental Health, Stress, & Well-being	
CHHS 608	Advanced Principles of Substance Abuse Prevention and Education	
CHHS 623	Sexuality Education: Theory and Practice	
CHHS 698	Lifespan Dimensions in Women's Health and Nutrition	
Total Hours		**15**

Students earning the MAEd in Community Health and completing two electives in lieu of the internship may not apply those same elective credits to this certificate. Program coordinator approval for course substitutions will be required and may include but are not limited to: CHHS 601 , CHHS 611 , CHHS 612, CHHS 640, EPR 610, EPR 614, KIN 607

M.A.Ed. in Community Health

Designed to prepare individuals for advanced health education and promotion careers in agencies, schools, worksites, and allied health care settings. All courses are offered online. This program is aligned with the National Commission for Health Education Credentialing standards and prepares students to sit for the Certified Health Education Specialist (CHES) or the Master Certified Health Education Specialist (MCHES) examination. CHES/MCHES provides evidence of competency of the knowledge, skills and application of the Areas of Responsibilities defining the role of an entry or masters-level health educator. Program options allow students to select a thesis, internship, or course work completion option based on approval of the Graduate Program Director and prior professional work experience of the individual student.

Master of Arts in Education in Community Health (Online)

Admission Requirement and Prerequisites

Plan I - 39 hours and Thesis

This is an online program.

Requirements		Hours
Major Courses		
EPR 594	Introduction to Educational Research Design	3
EPR 609	Statistical Methods and Research in Education: Intermediate	3
EPR 696	Qualitative Research: Inquiry and Analysis	3
CHHS 606	Advanced Issues of Disease Prevention in Health Education/Promotion	3
CHHS 610	The Advanced Health Education/Promotion Specialist	3
CHHS 621	Advanced Health Communications in Health Education/ Promotion	3
CHHS 631	Applied Planning and Implementation of Health Education/Promotion Programs	3
CHHS 632	Advanced Administration of Health Education/Promotion Programs	3
CHHS 642	Applied Behavioral Theory and Health Education/ Promotion	3
CHHS 689	Intervention Strategies for Health Education/Promotion	3
CHHS 697	Community-Based Approaches to Evaluation and Grantsmanship of Health Education/Promotion Programs	3
Thesis (6 hours of CHHS 699)		**6**
CHHS 699	Thesis Research (Responsible Conduct of Research Training Must Be Completed Prior to Advancement to Candidacy)	
Total Hours		**39**

Plan II - 39 hours and Comprehensive Exam (Non-Thesis Option)

This is an online program.

Requirements		Hours
Major Courses		
EPR 594	Introduction to Educational Research Design	3
EPR 596	Introduction to Qualitative Methods in Educational Research	3
EPR 609	Statistical Methods and Research in Education: Intermediate	3
CHHS 606	Advanced Issues of Disease Prevention in Health Education/Promotion	3
CHHS 610	The Advanced Health Education/Promotion Specialist	3
CHHS 621	Advanced Health Communications in Health Education/ Promotion	3
CHHS 631	Applied Planning and Implementation of Health Education/Promotion Programs	3
CHHS 632	Advanced Administration of Health Education/Promotion Programs	3
CHHS 642	Applied Behavioral Theory and Health Education/ Promotion	3
CHHS 689	Intervention Strategies for Health Education/Promotion	3
CHHS 697	Community-Based Approaches to Evaluation and Grantsmanship of Health Education/Promotion Programs	3
Courses for Non-Thesis Option Only		
CHHS 611	Interdisciplinary Approaches to School Health Education/Promotion	3

or CHHS 612	Student Health and Well-Being in Higher Education	
or CHHS 662	Advanced Worksite Health Education/Promotion	
CHHS 693	Capstone Experience in Community Health	3
Total Hours		**39**

Comprehensive Examination (for Non-Thesis Option)

The comprehensive examination is an opportunity for students to demonstrate the appropriate aptitude for advanced level health education competencies. The comprehensive exam is a culminating task that encompasses the content knowledge and critical thinking skills that a Health Education/Promotion Specialist should possess. A student cannot attempt the comprehensive examination more than twice. Those who cannot complete the comprehensive examination with a passing score during the second attempt will be dismissed from the program and not allowed readmission. Please contact the CHHS Graduate Program Director for additional information about examination scheduling.

Master of Arts in Education in Community Health (Online) with a Non-Profit Management Graduate Certificate

The M.A.Ed. degree requires a minimum of 45 credit hours for the Community Health with a Non-Profit Management Graduate certificate.

Plan I - 45 hours with Thesis

Requirements		Hours
CHHS 606	Advanced Issues of Disease Prevention in Health Education/Promotion	3
CHHS 610	The Advanced Health Education/Promotion Specialist	3
CHHS 631	Applied Planning and Implementation of Health Education/Promotion Programs	3
CHHS 642	Applied Behavioral Theory and Health Education/ Promotion	3
CHHS 689	Intervention Strategies for Health Education/Promotion	3
CHHS 697	Community-Based Approaches to Evaluation and Grantsmanship of Health Education/Promotion Programs	3
EPR 594	Introduction to Educational Research Design	3
EPR 609	Statistical Methods and Research in Education: Intermediate	3
EPR 696	Qualitative Research: Inquiry and Analysis	3
MPA 671	Marketing and Fundraising	3
MPA 672	Nonprofit Management	3
Graduate Level Elective (choose two)		6
MPA 674	GIS for Managers	
MPA 678	Strategic Planning	
MPA 684	Grants Management	
Thesis (6 hours of CHHS 699)		6
CHHS 699	Thesis Research (Pre-requisite GRD 717)	
Total Hours		**45**

Plan II - 45 hours with Comprehensive Exam

Requirements		Hours
CHHS 606	Advanced Issues of Disease Prevention in Health Education/Promotion	3
CHHS 610	The Advanced Health Education/Promotion Specialist	3
CHHS 631	Applied Planning and Implementation of Health Education/Promotion Programs	3
CHHS 642	Applied Behavioral Theory and Health Education/ Promotion	3
CHHS 689	Intervention Strategies for Health Education/Promotion	3
CHHS 697	Community-Based Approaches to Evaluation and Grantsmanship of Health Education/Promotion Programs	3
EPR 594	Introduction to Educational Research Design	3
EPR 596	Introduction to Qualitative Methods in Educational Research	3
EPR 608	Introduction to Statistical Methods in Educational Research	3
MPA 671	Marketing and Fundraising	3
MPA 672	Nonprofit Management	3
Graduate Level Elective (choose two)		6
MPA 674	GIS for Managers	
MPA 678	Strategic Planning	
MPA 684	Grants Management	
CHHS 693	Capstone Experience in Community Health (OR 6 Hours of Additional CHHS Advisor Approved Course Work)	6
Total Hours		**45**

Comprehensive Examination

Students must also complete the comprehensive examination during their last academic year of coursework. The examination is an opportunity for students to demonstrate the appropriate aptitude for advanced level health education competencies. The comprehensive exam is a culminating task that encompasses the content knowledge and critical thinking skills that a Health Education/Promotion Specialist should possess. A student cannot attempt the comprehensive examination more than twice. Those who cannot complete the comprehensive examination with a passing score during the second attempt will be dismissed from the program and not allowed readmission. Please contact the CHHS Graduate Program Director for additional information about examination scheduling.

Community Health Promotion

For detailed information regarding admission requirements for the School of Education and Human Sciences graduate programs, please visit the Admissions Requirements website at https://www.uab.edu/education/studentservices/admission-requirements.

Community Health Promotion (PhD)

Graduate Program Coordinator: **Dr. Retta Evans**, rrevans@uab.edu

Ph.D. Community Health Promotion

The PhD program in Community Health Promotion offers a broad-based curriculum emphasizing biological, behavioral, and socio-cultural determinants of health, as well as interventions and policies aimed at improving community health. The curriculum provides students with the coursework, background, and practical experiences to become leading researchers and practitioners in the broad and rapidly growing field of health education and health promotion. Students learn the skills needed to work with individuals and communities to assess health needs, and then effectively plan, implement and evaluate culturally appropriate and theoretically based interventions to improve and promote health and to lessen unhealthy behaviors by addressing knowledge, attitudes,

skills, and beliefs in various settings. By the conclusion of the program, students are able to conceptualize the theoretical and philosophical basis of health promotion clearly and conduct their own independent research projects. The curriculum prepares students for careers in academia, clinical research, and leadership roles in community and public health promotion in private industry, as well as non-profit and governmental health organizations.

Ph.D. Admission Process

Consideration for admission to graduate study in health education will occur each Fall for acceptance to start the following Fall term. The completed application packet must be received by the Community Health and Human Services Program from the Graduate School by the dates shown:

Entry Term	Deadline
Fall	April 30

Candidates for admission must have completed a master's degree from an accredited institution in health education or a health-related field. Admission to doctoral study is initiated through the Graduate School. Applicants will: (a) request official transcripts of all college coursework to send to UAB Graduate School; (b) submit (3) letters of recommendation from professors or others who are qualified to judge your ability to complete doctoral coursework; and (c) submit writing sample(s), such as an essay describing your academic training, professional experiences and career goals. Admission to the program is competitive.The GRE is being waived for the Fall 2022 term.

Ph.D. applicants should have a cumulative GPA of 3.00/4.00 or greater for prior college coursework.

Ph.D. in Community Health Promotion Program of Study

Students may enter the program with a master's degree in health education, or closely related health field. Students with no prior academic background in health education will be required to take these co-requisites: CHHS 610, CHHS 631, & CHHS 697 during years one and two. This will be determined through a review of transcripts by the Graduate Program Director upon admission to the program. A required review of student credentials prior to admission will identify strengths and needs. This review will provide students with a blueprint for their course of study and will be conducted by the program director and faculty advisor. The PhD degree program will require students to complete a minimum of 72 credit hours. Students will meet regularly with a faculty advisor to plan course enrollment.

Research and Statistics Prerequisites: Students are required to have completed the following courses (or equivalents) BEFORE enrolling in the Advanced Research and Statistical Methods Core.

Requirements		Hours
EPR 594	Introduction to Educational Research Design	3
EPR 596	Introduction to Qualitative Methods in Educational Research	3
EPR 608 & EPR 607	Introduction to Statistical Methods in Educational Research and Computer Applications to Statistical Analysis	4
EPR 609	Statistical Methods and Research in Education: Intermediate	3
Total Hours		**13**

The specific components of the PhD program in Health Education and Health Promotion are outlined below.

Ph.D. through the School of Education and Human Sciences

Requirements		Hours
Health Promotion CORE Courses		**15**
CHHS 731	Advanced Theoretic/Scientific Basis of Health Education/Promotion	
CHHS 732	Advanced Planning and Implementation of Health Education/Promotion Programs	
CHHS 740	Evaluation and Research Methods in Health Education/ Promotion Programs	
CHHS 742	Health Disparities in Diverse Populations	
CHHS 734	Health Education Seminar I	
CHHS 735	Health Education Seminar II	
CHHS 736	Health Education Seminar III	
Research and Statistical Methods CORE Courses		**12**
CHHS 606	Advanced Issues of Disease Prevention in Health Education/Promotion	
EPR 696	Qualitative Research: Inquiry and Analysis	
EPR 710	Computer Applications and Advanced Statistical Methods	
Graduate Research Design [1]		
EPR 695	Survey Methods in Educational Research	
EPR 792	Mixed Methods Approaches to Educational Research	
Health Sciences Concentration [2]		**15**
Supervised Research (Pre-requisite GRD 717)		**12**
Dissertation Hours		**18**
Total Hours		**72**

1 Choose one course that fits the needs of your dissertation, with the approval of an advisor. Two examples are listed, but other courses could apply.

2 Selection of courses pre-approved by doctoral program advisor to build knowledge and skills in a cognate area, e.g. Health Disparities, Research, Global Health, Public Health Policy, Aging and Health, Disabilities and Health.

Comprehensive Examination

A written comprehensive examination is required of all candidates for the Ph.D. degree. To be eligible to sit for comprehensive exams, students must have successfully completed CHHS 731, CHHS 732, CHHS 740 and CHHS 742. Students must register for a minimum of 3 hours of graduate work during the semester in which the comprehensive exam is taken. The exam must be passed unconditionally before the student can defend his/her proposal and be advanced to candidacy.

To prepare, students should review all materials from listed coursework as well as other related courses and supplementary material. This exam is designed to test the student's ability to take a given population and design an appropriate, theory-based health intervention to the situation. Each student must synthesize and apply what has been learned

throughout the program. On the day of the exam, students will be given questions that require them to write a paper, describing an appropriate, theory based program to address the chosen health issue/population. This must involve thorough planning, implementation, and evaluation. The PRECEDE/PROCEED model should be used as a framework for the paper.

Comprehensive exams will be offered twice each year and is written and graded by the graduate faculty in the doctoral program. Grading of the comprehensive exam is done blinded, and by consensus. Students who fail to achieve passing scores will have one attempt to remediate within a calendar year. If a student fails a section for the second time, they will be dismissed from the program.

Counseling

Overview

The program in Counseling at the University of Alabama at Birmingham offers concentrations in Clinical Mental Health and Marriage, Couples, and Family at the Master's level. At the master's level students acquire core knowledge and clinical skills, which enable them to enter the profession of counseling.

All counseling concentrations (Clinical Mental Health and Marriage, Couples, and Family Counseling) are designed to meet the course-work and field experiences requirements for professional licensure in the State of Alabama. A 15-credit Marriage, Couples, and Family certificate is offered to provide additional coursework for mental health counselors who would like to broaden their clinical expertise and knowledge in Marriage, Couples, and Family counseling. A 15-credit Clinical Mental Health Counseling certificate is also offered to provide additional coursework for marriage, couples, and family counselors who would like to deepen their knowledge and skills in mental health.

The Counseling program at the University of Alabama at Birmingham is accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). Both of the counseling concentrations (Clinical Mental Health Counseling and Marriage, Couples, and Family Counseling) are CACREP-accredited.

Admission Process

Consideration for admission to graduate study in Counseling will occur in the fall and spring semesters.

For more information about admission to the Counseling program, please see the following link: https://www.uab.edu/education/home/graduate/counseling

Non-Degree Seeking Students

Potential students may take classes prior to admission to the Counseling Program as "non-degree seeking" students. However, non-degree seeking students are limited to 12 hours of coursework that may be transferred into the Counseling Program. Non-degree seeking students may enroll in elective courses with the permission of the instructor. It would be important for non-degree seeking students to make an advising appointment with a Counseling faculty member prior to enrolling in courses. Non-degree seeking students are not permitted to take courses not designated as open to non-degree seeking students. It is also important to note that students taking coursework as a non-degree seeking student do so at their own risk. Enrolling and passing non-degree seeking coursework *does not* guarantee admission into the program as admission criteria (e.g., test scores, undergraduate GPA, and interview) are the primary factors considered when reviewing student suitability for the program

Evaluation of Candidates

Counseling candidates are evaluated throughout the course of their program via a series of Key Performance Indicators (KPIs). These KPIs are found throughout the course of study, including indicators such as specific course assignments in Area I coursework, CPCE exam, and midterm/final evaluations in internship. Evaluation of the counselor-in-training is an on-going process. The faculty reserves the right to assess the candidate's appropriateness to be a professional counselor.

Dispositions

Counseling faculty individually review the professional dispositions (behaviors and attitudes) of students within each course in accordance with the Counseling Student Handbook. Additionally, faculty will collectively review student dispositions and overall progress in the program at the end of each semester. Dispositional areas identified as deficient could result in termination from the program**.**

Clinical Experience: Master’s Level

Clinical Mental Health counseling students are required to complete clinical placements in order to obtain the master’s degree in counseling and many of the outside agencies/entities require fingerprinting and background reviews prior to accepting a student for clinical placement. For all counseling students, the appearance of one or more felonies and/or several misdemeanors on a student’s background review may negatively impact placement potential and/or credential obtainment.

Per CACREP standards, before beginning the first semester of their clinical experience, students must obtain and submit proof of individual liability insurance. This is to be procured by the student at the student’s expense and must be maintained throughout the student’s clinical experience. Student must submit proof of current individual liability coverage at the beginning of each semester that student is enrolled in a clinical experience. This is a requirement for all counseling students, regardless of concentration. If proof of insurance is not provided, student will be administratively removed from the clinical course.

Prerequisites for the clinical experience include successful completion of required coursework, meeting the required outcomes and competencies in Area I, and successful completion of comprehensive exams. The practicum experience requires a minimum of 100 hours (including **40 hours of direct client contact**) on-site at an appropriate setting to be determined by the Clinical Coordinator. The internship is 600 hours (**including 240 hours of direct client contact**) on-site over two semesters (Each semester, students must have a minimum of 300 hours on -site and 120 hours of direct client contact.) Grading for the clinical experiences is on a Pass/Fail basis. To receive a Pass grade the counselor-in-training must be able to demonstrate basic counseling skills, behave in an appropriate professional manner consistent with the American Counseling Association's Code of Ethics, and satisfactorily complete the academic, dispositional and outcome requirements set forth in both the practicum and internship classes.

Certificate in Marriage, Couples, and Family Counseling

The certificate in Marriage, Couples, and Family counseling prepares school counselors and clinical mental health counselors to position

themselves to more effectively work with clients, to better align with evidence-based practice, and to increase their range of services and versatility through additional coursework in this subject area. The certificate is open to current UAB counseling students as well as graduates of Master's level school counseling and mental health programs. The certificate consists of 15 credits of coursework, and takes students about one year to complete on average.

Admission Process

Candidates seeking admission to the Marriage, Couples, and Family counseling certificate who are graduates of a Master's level counseling program, must complete an application found on the UAB Graduate School website, as well as submit a statement of purpose, and their graduate-level transcript. Admission is accepted for summer and fall terms. The admissions deadline for the certificate is April 1.The prerequisite course (ECG 691) for all other coursework for the certificate is offered in the summer term only.

Current UAB clinical mental health or school counseling students who wish to pursue the MCF certificate should speak with their advisor to arrange to complete the required coursework.

Note: 1) All students must complete ECG 691, ECG 685, ECG 689, ECG 680, and ECG 660 for a total of 15 hours. 2) A student who has graduated from the UAB Clinical Mental Health Counseling or School Counseling program may count ECG 691 and ECG 660 if these were already completed. 3) A student who has graduated from another university cannot count courses taken as part of a degree at another institution. 4) All MCF certificate students have the option of completing ECG 661: Play Therapy I as an elective.

Requirements		Hours
ECG 660	Relationships and Human Sexuality	3
ECG 680	The Intersections of Family and Community Systems	3
ECG 685	Marriage and Couples Counseling	3
ECG 689	Advanced Family Counseling Techniques	3
ECG 691	Introduction to Couples and Family Counseling	3
Total Hours		**15**

Certificate in Clinical Mental Health Counseling

Admission Process

Candidates seeking admission to the Clinical Mental Health counseling certificate who are graduates of a Master's level counseling program, must complete an application found on the UAB Graduate School website, as well as submit a statement of purpose, and their graduate-level transcript. Admission is accepted for summer and fall terms. The admissions deadline for the certificate is April 1.

Current UAB counseling students who wish to pursue the CMHC certificate should speak with their advisor to arrange to complete the required coursework.

Requirements		Hours
ECG 600	Intro to Integrated Care Counseling	3
ECG 613	Foundations of Substance Abuse	3
ECG 631	Suicide Prevention	3
ECG 650	Diagnosis and Treatment of Psychological Disorders	3
ECG 652	Advanced Counseling Techniques	3
Total Hours		**15**

Master of Arts in Counseling with a Concentration in Clinical Mental Health

The Master of Arts in Counseling with a concentration in Clinical Mental Health counseling is designed to prepare students to demonstrate knowledge and skills with several counseling modalities appropriate for a broad range of clients in a multicultural society; interact effectively with other helping professionals and referral resources; make appropriate counselor-client related decisions in the context of professional, ethical, and legal guidelines; and fill effectively entry-level positions of professional responsibility within the specialization of agency counseling. The coursework is approved by the Alabama Board of Examiners in Counseling, which allows graduates of the program to pursue licensure as professional counselors in the state of Alabama. For most students, it takes approximately 3 years or 8 terms (including summers) to complete the program.

Requirements		Hours
Area I		
EPR 590	Research & Prgm Eval in Coun	3
ECG 612	Professional Orientation	3
ECG 621	Theories of Individual Counseling	3
ECG 624	Assessment	3
ECG 626	Group Counseling: Process and Procedures	3
ECG 628	Social and Cultural Diversity	3
ECG 630	Career Development: Vocational and Life Planning	3
ECG 638	Practicum I: Clinical Skills and Techniques	3
EPR 614	Lifespan Human Development	3
Comprehensive Exam [1]		
Area II		
ECG 600	Intro to Integrated Care Counseling	3
ECG 613	Foundations of Substance Abuse	3
ECG 631	Suicide Prevention	3
ECG 650	Diagnosis and Treatment of Psychological Disorders	3
ECG 652	Advanced Counseling Techniques	3
ECG 653	Counseling Children and Adolescents	3
ECG 660	Relationships and Human Sexuality	3
ECG 691	Introduction to Couples and Family Counseling	3
Area III: Clinical Requirements		
ECG 695	Practicum II: Supervised Field Experience	3
ECG 697	Counseling Internship B	3
Total Hours		**57**

[1] The Counselor Preparation Comprehensive Exam will be given the semester of successful completion or upon successful completion of Area I. This is a "high stakes" assessment. Students who do not successfully pass this examination will be given an alternative portfolio assignment that must be completed in the following term. There are no exceptions. Students who do not pass the exam and do not complete and pass the portfolio will be dismissed from the program.

Master of Arts in Counseling with a Concentration in Marriage, Couples and Family Counseling

The Master of Arts in Counseling with a concentration in Marriage, Couples, and Family counseling is designed to prepare students to work with individuals, couples, or groups where interpersonal relationships are examined for the purpose of achieving more adequate, satisfying, and productive marriage and family adjustments; make appropriate ethical decisions as counseling professionals; comprehend systems theory and use it to conceptualize problems and solutions for couples and families; and fill effectively, entry-level positions of professional responsibility within the specialization of marriage and family counseling. The coursework allows graduates of the program to pursue licensure as marriage and family therapists in the state of Alabama. This program takes about 3 years to complete.

Requirements		Hours
Area I		
EPR 590	Research & Prgm Eval in Coun	3
ECG 612	Professional Orientation	3
ECG 621	Theories of Individual Counseling	3
ECG 624	Assessment	3
ECG 626	Group Counseling: Process and Procedures	3
ECG 628	Social and Cultural Diversity	3
ECG 630	Career Development: Vocational and Life Planning	3
ECG 638	Practicum I: Clinical Skills and Techniques	3
EPR 614	Lifespan Human Development	3
ECG 691	Introduction to Couples and Family Counseling	3
Comprehensive Exam [1]		
Area II		
ECG 613	Foundations of Substance Abuse	3
ECG 650	Diagnosis and Treatment of Psychological Disorders	3
ECG 653	Counseling Children and Adolescents	3
ECG 660	Relationships and Human Sexuality	3
ECG 680	The Intersections of Family and Community Systems	3
ECG 685	Marriage and Couples Counseling	3
ECG 689	Advanced Family Counseling Techniques	3
Area III: Clinical Requirements		
ECG 695	Practicum II: Supervised Field Experience	3
Counseling Internship		
ECG 696	Counseling Internship A	3
ECG 697	Counseling Internship B	3
Total Hours		**60**

[1] The Counselor Preparation Comprehensive Exam will be given the semester of successful completion or upon successful completion of Area I. This is a “high stakes” assessment. Students who do not successfully pass this examination will be given an alternative portfolio assignment that must be completed in the following term. There are no exceptions. Students who do not pass the exam and do not complete and pass the portfolio will be dismissed from the program.

Educational Leadership

Overview of Our Programs

The Educational Leadership program at UAB is designed to prepare educators to assumer a variety of leadership roles within education settings. Students will gain knowledge and leadership skills to support teaching and learning, apply ethical principles to problem-solving, decision-making, and policy, and champion models of equity and high educational standards for all.

For detailed information for each program in Educational Leadership, including admissions requirements, visit https://www.uab.edu/education/home/graduate/educational-leadership to get started.

Master of Arts in Education (M.A.Ed.) in Educational Leadership (Online, via Zoom)

The Master of Arts in Education in Educational Leadership at UAB prepares professional educators to assume key leadership roles in schools. The minimum 30-hour program is delivered online in synchronous class sessions via Zoom and may lead to Alabama Class A certification in Instructional Leadership. Courses cover a variety of topics, including leader theory, supervision, law, ethics, data-based decision making, and trauma-informed and restorative practices. Based on the most current educational leadership standards, our program provides students with great opportunities to develop relationships and professional networks with professors and practitioners in urban, suburban, and rural settings.

Post-Master's Certificate (PMC) in Instructional Leadership (Online, via Zoom)

The Post-Masters Certification (PMC) in Instructional Leadership at UAB is a reduced-hour option for students who already hold a master’s degree and current Alabama Class A certification in an instructional or instructional support area and who have a minimum of three years’ certified classroom teaching experience. Like our master’s program, this minimum 18-hour option delivers courses online in synchronous class sessions via Zoom and may lead to Alabama Class A certification in Instructional Leadership.

Educational Specialist’s (Ed.S.) in Educational Leadership (Online, via Zoom)

The Educational Specialist’s (Ed.S.) in Educational Leadership at UAB will further sharpen skills and develop new competencies in instructional leadership. This minimum 30-hour program, leading to Alabama Class AA certification in Instructional Leadership, is delivered online in regular occurring class sessions via Zoom. Based on the most current educational leadership standards, our program provides students with great opportunities to develop relationships and professional networks with professors and practitioners in urban, suburban, and rural settings.

Additional Information

For additional information, visit: https://www.uab.edu/education/home/graduate/educational-leadership or contact Dr. Amy Dagley, Program Director, at dagley@uab.edu.

Master of Arts in Education in Educational Leadership

The Master of Arts in Education (M.A.Ed.) in Educational Leadership degree requires a minimum of 30 credit hours for completion. Students who are unconditionally admitted into the certificate program before taking classes may qualify for Alabama Class A certification in Instructional Leadership upon completing the program, if the student holds a GPA of 3.25 and passes the ELAS praxis exam as designated by the state of Alabama. Courses are offered online via Zoom.

Requirements		Hours
Instructional Leadership:		
EDL 651	Leadership to Promote Ethics and Well-Being	3
EDL 652	Leadership for Student Support	3
EDL 653	Leading Action Research for School Improvement	3
EDL 654	Survey of Instructional Leadership	3
EDL 655	Systematic Inquiry for School Improvement	3
EDL 656	Supervision & Instructional Leadership	3
EDL 657	Law & Ethics for School Leaders	3
EDL 658	Leadership for Diversity and Inclusive Education	3
Required Internship/Practicum:		
EDL 659	Residency in Instructional Leadership	3
Additional Required Research and SPED Courses:		
EPR 594	Introduction to Educational Research Design	3
ECY 600	Introduction to Exceptional Learner [1]	3

[1] Not required if previously completed

Post-Master's Certificate in Educational Leadership

The Post-Master's Certificate (PMC) in Educational Leadership requires a minimum of 18 credit hours for completion. Students who are unconditionally admitted into the certification program before taking classes may qualify for Alabama Class A certification in Instructional Leadership upon completing the program, if the student holds a GPA of 3.25 and passes the ELAS praxis exam as designated by the state of Alabama. Courses are offered online via Zoom.

Requirements		Hours
Instructional Leadership:		
EDL 654	Survey of Instructional Leadership	3
EDL 655	Systematic Inquiry for School Improvement	3
EDL 656	Supervision & Instructional Leadership	3
EDL 657	Law & Ethics for School Leaders	3
EDL 658	Leadership for Diversity and Inclusive Education	3
Required Internship/Practicum:		
EDL 659	Residency in Instructional Leadership	3
Additional Research and SPED Courses:		
ECY 600	Introduction to Exceptional Learner [1]	3

[1] Not required if previously completed

Educational Specialist in Educational Leadership

The Educational Specialist (Ed.S.) in Educational Leadership degree requires a minimum of 30 credit hours for completion. Students who are unconditionally admitted into the certificate program before taking classes may qualify for Alabama Class AA certification in Instructional Leadership upon completing the program, if the student completes the program with a GPA of 3.5 on a 4.0 scale. Courses are offered online via Zoom.

Requirements		Hours
EDL 700	School and District Resource Allocation (includes field experience)	3
EDL 704	Educational Law and Policy Development (includes field experience)	3
EDL 733	Organizational Behavior (includes field experience)	3
EDL 734	Ethical Dimension of Leadership (includes field experience)	3
EDL 736	Leadership and the Learning Spectrum (includes field experience)	3
EDL 737	Instructional Supervision & Human Resources (includes field experience)	3
EDL 738	Leading Inclusive Organizations and Building Engagement (includes field experience)	3
EDL 739	Program Evaluation (includes field experience)	3
EPR 608	Introduction to Statistical Methods in Educational Research	3
EDF 702	Critical Social Issues in American Education	3
ECY 600	Introduction to Exceptional Learner	3
EDL 746	Practicum in Instructional Leadership (Required if Class A certification was earned prior to 2008.)	1

Higher Education Administration

Master of Science in Higher Education Administration

The Master of Science in Higher Education Administration serves the purpose of preparing students for innovative and socially responsible leadership roles within higher education. Students will gain knowledge and leadership skills necessary to meet the growing challenges of working with and supporting a culturally diverse student population consisting of first generation students, underrepresented minoritized students, international students, and/or students who face economic challenges.

Students pursuing an M.S. in Higher Education Administration may choose between two tracks. These include the Higher Education Administration track (thesis or non-thesis) and an Academic Advising track (non-thesis). Coursework for all options is offered entirely online.

Higher Education Administration Track

Thesis: The thesis option consists of 39 credit hours. This path is for those seeking upward mobility within the field of higher education in either student or academic affairs, as well as those seeking to further their academic research skills in preparation for doctoral study. Students who choose this path are required to take a minimum of 6 credit hours of thesis research. The thesis option will require successful completion of the thesis defense.

Non-Thesis: The non-thesis option consists of 36 credit hours and successful completion of a practicum and comprehensive exam. This path is designed to give students a foundation in education research, while also focusing on content relevant to those who wish to work or are currently working in academic or student affairs. This general option gives students the ability to elect to complete a practicum course and submit

an experiential project to complete degree requirements. All practicum students may select from the following options:

- Select an administrative practicum in an area of interest
- Select an experiential practicum focused on preparation for a national or regional conference
- Select a written practicum focused on publication
- Select a personalized practicum with your faculty advisor

The Non-thesis option will require successful completion of a comprehensive exam. Comprehensive exam dates and timelines will be announced at the beginning of the final semester of a student's degree plan. Students will be given a period of no more than two weeks to complete their comprehensive exam. No collaboration nor outside help is allowed during the exam period. Failure to independently complete the comprehensive exam will result in an automatic no-pass score and the student will be removed from the program with no option to reapply.

Higher Education Administration - Academic Advising Track

Non-Thesis: The Higher Education Administration - Academic Advising track is a non-thesis option consisting of 36 credit hours, successful completion of a practicum, and comprehensive exam. This path is designed to give students a foundation in academic advising competencies required for the administration of academic advising within higher education. Students will gain valuable knowledge on the advancement of academic advising practices, create their own personalized advising philosophy, develop assessment skills, as well as applicable knowledge of diversity, equity, inclusion, and how to create a sense of belonging to support all students. Special attention will be given to work related to supporting students who identify within marginalized and minoritized populations. This track option gives students the ability to complete a practicum course and submit an experiential project to complete degree requirements. All practicum students may select from the following options:

- Select an administrative practicum in an area of interest
- Select an experiential practicum focused on preparation for a national or regional conference
- Select a written practicum focused on publication
- Select a personalized practicum with your faculty advisor

Higher Education Administration - Diversity, Equity, Inclusion, and Advocacy Track

Non-Thesis: The Diversity, Equity, Inclusion, and Advocacy (DEIA) track within the Master of Science in Higher Education Administration degree program is a non-thesis option consisting of 36 credit hours, successful completion of a practicum, and comprehensive exam. The DEIA track will fulfill a much-needed gap in preparing future DEI professionals both within higher education and within the corporate world. It is designed to provide learners with opportunities to gain knowledge, skills, and competencies associated with advancing personal, social, and cultural initiatives to combat interpersonal and systemic inequities as well as foster cultures of inclusion and justice. Learners will display their knowledge of and ability to apply desirable competencies within, yet not limited to post-secondary education institutions, civic engagement, nonprofit, and politically minded organizations, health care providers, as well as the business and industry sectors.

Admission Requirements for All Tracks

Applicants must meet the following requirements for admission to the Master of Science in Higher Education Administration:

- Completed undergraduate degree (any major)
- An official copy of all transcripts
- GPA of at least 2.5 on a 4.0 scale
- Resume/CV
- Statement of purpose
- Three professional recommendations
- Interview
- No GRE score is required

Learning Outcomes

The Master of Science in Higher Education Administration program will prepare students with competency in the following areas:

- Knowledge of organizational theory, as well as social and policy issues that critically impact student success.
- Knowledge of ways in which to engage in strategic partnerships between academic affairs and student affairs to provide critical support structures for student success.
- Knowledge of the unique challenges and variations within higher education, including differences in schools by regions of the United States, urban/rural institutions, tribal colleges and universities (TCUs), historically Black colleges and universities (HBCs), and other iterations of higher education institutions.
- Knowledge of organization, culture, diversity and the history of higher education.
- Knowledge of relevant research on student development theories.
- Knowledge and skills to engage in and use research and assessment to improve education programs and practices within higher education.
- Knowledge and skills to be competitive when seeking admission to advanced degree programs.

Graduate Certificate in Higher Education Administration

The Higher Education Administration Graduate Certificate serves the purpose of preparing current and future professionals with the knowledge base necessary to be successful within their current positions within higher education, as an avenue for work-related advancement and promotion, and/or enrollment in a future degree-seeking graduate program in Higher Education.

Admission Requirements

Applicants must meet the following requirements for admission to the Graduate Certificate in Higher Education Administration:

- Completed undergraduate degree with an overall GPA of at least 2.5 on a 4.0 scale OR current UAB undergraduate student in good standing with 60+ credit hours completed and an institutional GPA of 3.0 (Applicants do not need to have earned a degree in education nor be currently pursuing a degree in education).
- Applicants must submit an official copy of their transcripts.
- Submit a purpose statement outlining the reason student is pursuing the Graduate Certificate (***not to exceed one page***).

- Provide a letter of recommendation from your current (most recent if currently unemployed) supervisor.

Note: If undergraduate students meet the certificate admission criteria stated above, they can start the Higher Education Administration Graduate Certificate while still pursuing their bachelor's degree. However, because of their admission to a Graduate Certificate program, these undergraduate students cannot use the graduate credit hours from this certificate program toward their undergraduate degree. After having earned their undergraduate degree and also having earned the Higher Education graduate certificate, alumni will be able to use up to 12 credit hours from their graduate certificate toward an Master of Science in Higher Education Administration at UAB if completed within five years of having earned their undergraduate degree.

Learning Outcomes

The Higher Education Administration Graduate Certificate will prepare certificate-seekers with competency in the following areas:

- Organization, culture, diversity and history of higher education,
- Governance, structure, and management of higher education institutions,
- Research, theoretical, and practical issues surrounding access to college and equity in higher education, and
- Critical support systems within higher education that promote student success.

Students pursuing an M.S. in Higher Education Administration may choose between two tracks. The Higher Education Administration track has both a thesis and non-thesis option. The Academic Advising track is a non-thesis only option. Coursework for all options is offered entirely online. All non-thesis options require successful completion of the comprehensive exam for graduation. The thesis option requires successful defense of the master's thesis for graduation.

Master of Science in Higher Education Administration

Higher Education Administration Track (Thesis Option)

Requirements		Hours
Major Courses		
HEA 600	Administration of Higher Education	3
HEA 610	History of Higher Education	3
HEA 620	Access & Equity in Higher Education	3
HEA 630	Higher Education Law	3
HEA 640	Organization, Leadership, & Change	3
HEA 660	College Student Development	3
HEA 670	Strategic Partnerships in Academic & Student Affairs	3
HEA 680	Practical Issues & Challenges in Higher Education	3
Electives		**3**
HEA 685	Special Topics	
CHHS 612	Student Health and Well-Being in Higher Education	
EDF 602	Critical Social Issues in American Education	
EDF 620	Culture and American Education: Race Class and Gender	
Research Courses		
EPR 594	Introduction to Educational Research Design	3
EPR 608	Introduction to Statistical Methods in Educational Research	3
or EPR 596	Introduction to Qualitative Methods in Educational Research	
Thesis		
HEA 699	Thesis Research	3
HEA 699	Thesis Research	3
Total Hours		**39**

Higher Education Administration Track (Non-Thesis Option)

Requirements		Hours
Major Courses		
HEA 600	Administration of Higher Education	3
HEA 610	History of Higher Education	3
HEA 620	Access & Equity in Higher Education	3
HEA 630	Higher Education Law	3
HEA 640	Organization, Leadership, & Change	3
HEA 650	Assessment & Evaluation of Higher Education	3
HEA 660	College Student Development	3
HEA 670	Strategic Partnerships in Academic & Student Affairs	3
HEA 680	Practical Issues & Challenges in Higher Education	3
Electives		**3**
HEA 685	Special Topics	
CHHS 612	Student Health and Well-Being in Higher Education	
EDF 602	Critical Social Issues in American Education	
EDF 620	Culture and American Education: Race Class and Gender	
Research Courses		
EPR 594	Introduction to Educational Research Design	3
Practicum		
HEA 690	Practicum in Higher Education	3
Total Hours		**36**

Higher Education Administration - Academic Advising Track (Non-Thesis Option)

Requirements		Hours
Major Courses		
HEA 610	History of Higher Education	3
HEA 630	Higher Education Law	3
HEA 640	Organization, Leadership, & Change	3
HEA 660	College Student Development	3
HEA 670	Strategic Partnerships in Academic & Student Affairs	3
HEA 680	Practical Issues & Challenges in Higher Education	3
Concentration Courses		
AADV 600	Academic Advising History and Practices	3
AADV 610	Assessment in Academic Advising	3
AADV 620	Diversity, Equity, Inclusion, and Advocacy in Academic Advising	3
Concentration Electives		3
AADV 630	Special Topics Seminar in Academic Advising	
AADV 640	Special Topics Workshop in Academic Advising	
Research Courses		
EPR 594	Introduction to Educational Research Design	3
Practicum		

HEA 690	Practicum in Higher Education	3
Total Hours		**36**

Higher Education Administration - Diversity, Equity, Inclusion, & Advocacy Track (Non-Thesis Option)

Requirements		**Hours**
Major Courses		
HEA 600	Administration of Higher Education	3
HEA 610	History of Higher Education	3
HEA 630	Higher Education Law	3
HEA 650	Assessment & Evaluation of Higher Education	3
HEA 660	College Student Development	3
HEA 670	Strategic Partnerships in Academic & Student Affairs	3
Concentration Courses		
DEIA 510	Diversity Policy Politics and Practice	3
DEIA 520	Equity and Inclusion	3
DEIA 530	Leadership in Social Justice Advocacy, Self and Others	3
DEIA 590	Engaged Scholarship in Diversity, Equity, Inclusion, and Advocacy	3
Concentration Elective: DEIA majors must work with the DEIA advisor to select a 3-hour approved elective course.		3
Research Courses		
EPR 594	Introduction to Educational Research Design	3
Total Hours		**36**

Individuals who complete the Higher Education graduate certificate will be able to use 12 credit hours from their graduate certificate toward the Master of Science in Higher Education Administration at UAB if completed within five years of having earned their undergraduate degree.

Certificate in Higher Education Administration

Requirements		**Hours**
Required Coursework		
HEA 600	Administration of Higher Education	3
HEA 610	History of Higher Education	3
HEA 620	Access & Equity in Higher Education	3
Advisor Approved Electives		**6**
HEA 630	Higher Education Law	
HEA 640	Organization, Leadership, & Change	
HEA 660	College Student Development	
HEA 670	Strategic Partnerships in Academic & Student Affairs	
HEA 680	Practical Issues & Challenges in Higher Education	
HEA 685	Special Topics	
Total Hours		**15**

Kinesiology

Degrees offered include the Master of Science and the Educational Specialist. At the master's degree level, students may specialize in Exercise Physiology (see listing below for more information about this program) or complete a teacher certification program (traditional master's program for those holding a valid B level certificate in physical education or the alternative master's program for those NOT completing an undergraduate physical education teacher education program). The traditional master's and the educational specialist link teacher certification with the graduate program in physical education. For example, the M.S. awards the level A certificate and the Ed.S. is linked to the AA certificate. Each program requires a teaching certificate in physical education at the previous level (e.g., B certificate for admission to the A level, except the Alternative A program, and the A certificate for admission to the AA certificate).

Dispositions

Faculty individually review the professional dispositions (behaviors and attitudes) of students within each course in accordance with the School of Education's policy and procedure. Additionally, faculty will collectively review student dispositions and overall progress in the program at the end of each semester. Dispositional areas identified as deficient could result in termination from the program**.**

Master of Science in Kinesiology with a Concentration in Exercise Physiology

The Master of Science in Kinesiology with a concentration in Exercise Physiology serves the purpose of preparing students to work in higher education, as a fitness instructor, wellness educator, researcher, coach, secure a leadership position in a fitness facility, or pursue doctoral studies.

Thesis Option

The thesis option consists of 33 credit hours. This path is for those seeking to further their academic research skills in preparation for doctoral study or a career in research. Students who choose this path are required to take 6 credit hours of thesis research. The thesis option will require successful completion of the thesis defense. The thesis option requires students to follow a specific timeline; this is essential to completing their degree on time. Failure to comply with the timeline will result in delays. The thesis timeline can be located on the Graduate School's website.

Non-Thesis Option

The non-thesis option consists of 36 credit hours and the successful completion of a comprehensive exam. This path is designed to give students a foundation in Kinesiology, while also focusing on content relevant to their areas of interest. This option allows students to choose more electives that align with their interests while taking a comprehensive exam at the end of the program.

The Non-thesis option will require successful completion of a comprehensive exam. Comprehensive exam dates and timelines can be found on the Exercise Physiology Website. Students will register the semester before the semester they complete their comprehensive exam, which is during their final semester (if completing the program within 3 semesters) or the semester before their last semester (if completing the program in more than 3 semesters). The exam will be completed on a Friday during the semester they registered for and no collaboration nor outside help is allowed during the 4-hour exam. Failure to independently complete the comprehensive exam will result in an automatic no-pass score and the student will be required to retake the exam the following semester. They must complete the comprehensive exam before they will be allowed to graduate.

Admissions Requirements

Applicants must meet the following requirements for admission to the Master of Science in Kinesiology with a concentration in Exercise Physiology:

· Completed undergraduate degree (any major) from a regionally accredited institution

- Pre-reqs courses required before acceptance (grade of C or better)
  - Biology, Chemistry, Human Anatomy, and Human Physiology

· An official copy of all transcripts

· GPA of at least 2.75 on a 4.0 scale

· Resume/CV

· Statement of purpose

· Three Letters of recommendation

· GRE is not required

Graduate Certificate in Clinical Exercise Physiology

The certificate will help provide fundamental knowledge, skills, and abilities to conduct exercise testing and prescription in clinical and non-clinical settings. The certificate can be completed as a stand-alone certificate for undergraduate or graduate students majoring in exercise science or related fields (nutrition, biomedical science, biology, community health, and health education). Or may be used as part of the Graduate School's Master's Degree of Interdisciplinary Graduate Studies (IGS).

Students who have completed a master's degree in Kinesiology with a concentration in Exercise Physiology from UAB are not eligible to complete the graduate certificate in clinical exercise physiology.

Admission Requirements

Applicants must meet the following requirements for admission to the Graduate Certificate in Clinical Exercise Physiology:

· Completed undergraduate degree with an overall GPA of at least 2.5 on a 4.0 scale OR current UAB undergraduate student in good standing with 60+ credit hours completed (36 of these credit hours must have been taken at UAB) and an institutional GPA of 3.0 (Applicants do not need to have earned a degree in kinesiology nor be currently pursuing a degree in kinesiology).

· Applicants must submit a certificate-seeking application for admission to the UAB Graduate School.

Note: Undergraduate students cannot use the graduate credit hours from this certificate program toward their undergraduate degree.

Graduate Certificate in Coaching the Intercollegiate Scholar Athlete

This program will provide current or aspiring athletic coaches throughout our state, and the region, with access to a strategically designed practitioner-focused credential to support their career competencies and advancement. The certificate will be offered as a stand-alone to undergraduate or graduate students majoring in exercise science or related fields (nutrition, biomedical science, biology, community health, and health education). Or may be used as part of the Graduate School's Master's Degree of Interdisciplinary Graduate Studies (IGS).

Admission Requirements

Applicants must meet the following requirements for admission to the Graduate Certificate in Clinical Exercise Physiology:

· Completed undergraduate degree with an overall GPA of at least 2.5 on a 4.0 scale OR current UAB undergraduate student in good standing with 60+ credit hours completed (36 of these credit hours must have been taken at UAB) and an institutional GPA of 3.0 (Applicants do not need to have earned a degree in kinesiology nor be currently pursuing a degree in kinesiology).

· Applicants must submit a certificate-seeking application for admission to the UAB Graduate School.

Note: Undergraduate students cannot use the graduate credit hours from this certificate program toward their undergraduate degree.

Students can start this 15-hour Coaching the Intercollegiate Scholar Athlete Graduate Certificate in either the fall, spring, or summer. Applicants do not need to have earned a degree in kinesiology.

Accelerated Learning Opportunities

Master in Kinesiology with a concentration in Exercise Physiology via the Accelerated Bachelors/Masters (EPH-ABM) Program

Exercise Physiology offers an Accelerated Bachelors/Masters (ABM) option for high-achieving undergraduates. Distinct advantages of EPH-ABM include the use of up to 12 hours of shared credit this is applied to both your BS and MS degrees, taking graduate courses at the undergraduate tuition rate, and additional opportunities for academic advising and mentoring.

Admission Requirements

· Junior status (60 credit hours, 36 of these hours at UAB)

· Minimum 3.5 undergraduate GPA

· Complete the following pre-requisite courses: BY 115, BY 116, CHHS 140, CHHS 141, KIN 136, KIN 307, & KIN 400

· UAB Transcript (uploaded by Graduate School)

· ABM Form

· Application Fee

· Essay

· Resume

- Maintain a 3.0 GPA average in undergraduate Exercise Science courses while in the EPH-ABM
- Receive a B (or better) in graduate courses taken while still an undergraduate student
- Maintain full-time-student status at UAB (with exceptions for medical emergencies)

The following courses are approved for shared credit for students pursuing an ABM in Exercise Physiology: KIN 585, KIN 639, KIN 640, KIN 641, KIN 645, KIN 649, KIN 656, KIN 672, and KIN 674

Note: If any of the requirements are violated, the student will be withdrawn from the EPH-ABM program. If a student is withdrawn, they will retain credit for the courses already taken in the program, but no credit sharing will be allowed even if later the student enrolls in a graduate program in the Department of Human Studies. Once the undergraduate student has completed all course requirements for graduation, their undergraduate degree will be awarded.

Once the student graduates with a B.S., they continue to take additional coursework to fulfill the degree requirements of their M.S. program. The M.S. degree will be awarded after those requirements.

Deadlines for all Applicants:

· **Fall:** August 1

· **Spring:** December 1

· **Summer:** May 1

For More Information:

Please contact Dr. Gordon Fisher (Graduate Program Director; grdnfs@uab.edu), or visit our website: https://www.uab.edu/education/home/graduate/kinesiology/ms-kinesiology-exercise-physiology-concentration.

Master of Science and "A" level teaching certificate; Non-Thesis

(30-33 hours)

Teaching Field: At least 1/3 of the program shall be teaching field courses. (18 hours)

Requirements		Hours
KIN 643	Curriculum Development in Physical Education	3
KIN 647	Teaching Strategies and Issues in K-12 PE	3
KIN 649	Advanced Adapted Physical Education [1]	3
KIN 693	Advanced Field Experience in Physical Education	3
Additional Courses (12-15 hours)		
Survey of Special Education Coursework: Required if not previously completed (0-3 hours)		0-3
ECY 600	Introduction to Exceptional Learner [2]	
Electives (as approved by advisor) [3]		12
EPR 594	Introduction to Educational Research Design	3
EDF or EPR 600 level course		3
Total Hours		**30-33**

1 Approved diversity course

2 Survey of Special Education Coursework: Required if not previously completed (0-3 hours)

3 Potential courses that may be used for the Electives in the Physical Education Teacher Certification Master's Degree Program: KIN 601, KIN 607, KIN 636, KIN 645, KIN 650, KIN 651, KIN 672, KIN 693, KIN 694,. Other graduate level courses may be used with the consent of your Advisor.

Master of Science and "A" level teaching certificate; Thesis

(30-33 hours)

Teaching Field: At least 1/3 of the program shall be teaching field courses. (18 hours)

Requirements		Hours
KIN 643	Curriculum Development in Physical Education	3
KIN 647	Teaching Strategies and Issues in K-12 PE	3
KIN 649	Advanced Adapted Physical Education [1]	3
KIN 693	Advanced Field Experience in Physical Education	3
EPR 608	Introduction to Statistical Methods in Educational Research	3
KIN 699	Thesis Research	6
Elective (as approved by advisor)		3
Survey of Special Education Coursework: Required if not previously completed (0-3 hours) [2]		0-3
ECY 600	Introduction to Exceptional Learner [3]	
Additional Courses (6 hours)		
EPR 594	Introduction to Educational Research Design	3
EDF or EPR 600 level course		3
Total Hours		**30-33**

1 Approved diversity course

2 Survey of Special Education Coursework: Required if not previously completed (0-3 hours)

Exercise Physiology

The Exercise Physiology specialization offers a master's degree option for students interested in either clinical exercise physiology or physiology research. The curriculum is multidisciplinary and can comprise of courses in the Schools of Education, Medicine, Health Related Professions, and Public Health. Two program plans are offered (detailed below). Plan I culminates with a thesis research project, and Plan II culminates with a written comprehensive exam. Resources for student participation in research include an Exercise Physiology Laboratory and Exercise & Nutritional Physiology Laboratory. Wide arrays of field experiences are also available at UAB and in local agencies and clinics. In addition to Graduate School admission requirements, prospective students must have completed undergraduate coursework in Biology or Chemistry. Listed below are the courses required in the program and a sample of elective courses.

Master of Science in Kinesiology with Exercise Physiology Concentration

Admission Requirement and Prerequisites

In addition to the general admission requirements of the Graduate School, potential applicants must have passed an undergraduate or graduate level Biology, Chemistry, Anatomy, and Physiology courses. A minimum undergraduate GPA of 2.75 is required.

Plan I - 33 hours with Thesis

Requirements		Hours
EPR 594	Introduction to Educational Research Design	3
EPR 609	Statistical Methods and Research in Education: Intermediate [1]	3

KIN 637	Physiology of Exercise I	3
KIN 638	Physiology of Exercise II	3
KIN 642	Practicum in Physiology	3
KIN 699	Thesis Research	6
Electives in Major [2]		12
Total Hours		**33**

1 EPR 609 has a prerequisite of EPR 608 or equivalent (the equivalent must have been completed within two years of enrolling in EPR 609 and the student must have earned a grade of C or better); OR, a student may take a by-pass exam and earn a score of 70 or above. Please contact Dr. Jenna LaChenaye, (EPR Program Director), jmlach@uab.edu if you have questions regarding this EPR Policy.

2 Potential courses that may be used for the Electives in the Exercise Physiology Master's Degree Program: CHHS 602, CHHS 621, CHHS 631, BY 511, GER 540, BY 611, BY 616, BHS 550, BHS 555, CH 560, EPR 607, EPR 608, KIN 585, KIN 639, KIN 640, KIN 641, KIN 645, KIN 653, KIN 656, KIN 672, KIN 674, KIN 694, KIN 695, KIN 697, NTR 521, NTR 601, NTR 609, NTR 779, NTR 618, NTR 625, NTR 750, RHB 780, RHB 781. Other graduate-level courses may be used with the consent of your Advisor.

Plan II - 36 hours with Comprehensive Exam

Requirements		Hours
EPR 594	Introduction to Educational Research Design	3
EPR 609	Statistical Methods and Research in Education: Intermediate [1]	3
KIN 637	Physiology of Exercise I	3
KIN 638	Physiology of Exercise II	3
Electives in Major [2]		24
Total Hours		**36**

1 EPR 609 has a prerequisite of EPR 608 or equivalent (the equivalent must have been completed within two years of enrolling in EPR 609 and the student must have earned a grade of C or better); OR, a student may take a by-pass exam and earn a score of 70 or above. Please contact Dr. Jenna LaChenaye, (EPR Program Director), jmlach@uab.edu if you have questions regarding this EPR Policy.

2 Potential courses that may be used for the Electives in the Exercise Physiology Master's Degree Program: CHHS 602, CHHS 621, CHHS 631, BY 511, GER 540, BY 611, BY 616, BHS 550, BHS 555, CH 560, EPR 607, EPR 608, KIN 585, KIN 639, KIN 640, KIN 641, KIN 645, KIN 653, KIN 656, KIN 672, KIN 674, KIN 694, KIN 695, KIN 697, NTR 521, NTR 601, NTR 609, NTR 779, NTR 618, NTR 625, NTR 750, RHB 780, RHB 781. Other graduate-level courses may be used with the consent of your Advisor.

Master of Science in Kinesiology: Physical Education Alternative Master's Non-Thesis Program

The M.S. requires a minimum of 45 hours for the Physical Education Alternative Master's Non-Thesis program. A GPA of 3.25 is required.

Requirements		Hours
KIN 645	Advanced Motor Development	3
EDF or EPR 500-600 level course (Advisor Approval Required)		3
KIN 589	Physical Education Instructional Strategies	6
Required if not previously completed:		0-3
ECY 600	Introduction to Exceptional Learner [1]	
KIN 508	Adapted Physical Education [2]	3
KIN 509	Assessment in Physical Education	3
KIN 511 & 511L	Elementary School Physical Education and Educational Dance & Gymnastics	3
KIN 520 & 520L	Fitness and Motor Skill Acquisition and Sport Skill Proficiency	4
KIN 523	Techniques of Teaching Fitness and Nutrition in Schools	3
KIN 607	Principles of Coaching	3
KIN 696	Elementary/Secondary Physical Education Internship	9
EPR 608	Introduction to Statistical Methods in Educational Research	3
EDR 521	Reading in Content Areas	1
Total Hours		**44-47**

1 Survey of Special Education Coursework: Required if not previously completed (0-3 hours)

2 Approved diversity course

Education Specialist Degree in Education with a Concentration inPhysical Education

The Ed.S. degree requires a minimum of 30 credit hours for the Physical Education program. A minimum GPA of 3.50 is required.

Requirements		Hours
Teaching Field		
At least 1/3 of the program shall be teaching field courses (12 hours)		
KIN 636	Current Readings in Physical Education	3
KIN 715	Advanced Field Experience in Physical Education	3
KIN 726	Supervised Research in Physical Education	3
KIN 729	Physical Education Seminar	3
Survey of Special Education Coursework: Required if not previously completed (0-3 hours)		0-3
ECY 600	Introduction to Exceptional Learner [1]	
Select one course from the list below:		3
KIN 649	Advanced Adapted Physical Education [2]	
EDF 702	Critical Social Issues in American Education [2]	
EDF 720	Cult and Amer Educ: Race Class and Gender [2]	
Additional Courses		
Select two courses from the list below		6
EPR 594	Introduction to Educational Research Design	
EPR 608	Introduction to Statistical Methods in Educational Research	
EPR 609	Statistical Methods and Research in Education: Intermediate	
Elective		
600-700 level Electives with permission of Advisor		9
National Board Certification in Physical Education can be transferred in as 6 hours of elective credit:		
KIN 694	Special Projects in Kinesiology	
Total Hours		**30-33**

1 Not required if previously completed

2 Approved diversity course

Graduate Certificate in Clinical Exercise Physiology

Requirements		Hours
KIN 639	Exercise Prescription for High Risk Populations	3
KIN 644	Application of Exercise Physiology to Fitness and Performance	3
KIN 697	Advanced Field Experience in Kinesiology	6
KIN 640	Advanced Techniques in Conditioning the Athlete	3
or KIN 585	Advanced Exercise Testing and Prescription	
Total Hours		**15**

Graduate Certificate in Coaching the Intercollegiate Scholar Athlete

Requirements		Hours
LEAD 500	Introduction to Leadership Behaviors, Characteristics and Theories	3
HEA 660	College Student Development	3
KIN 652	Measurement and Evaluation of Athletes	3
KIN 656	Advanced Sport Psychology	3
KIN 690	Seminar in Sports Administration	1
KIN 698	Coaching Internship (Individual Sport)	2
Total Hours		**15**

School of Engineering

Dean: Jeffrey W. Holmes, MD, PhD
Associate Dean for Academic Affairs & Graduate Programs: Gregg M. Janowski, PhD
Associate Dean for Undergraduate Programs: Andrew Sullivan, MSCE, PE
Associate Dean for Research: Mark Banaszak Holl, PhD

The School of Engineering is comprised of four departments: Biomedical Engineering; Civil, Construction, and Environmental Engineering; Electrical and Computer Engineering; and Mechanical and Materials Engineering. The School offers seven programs leading to a master's degree and six programs leading to a doctoral degree. In addition, the Neuroengineering PhD program is jointly offered by the School of Engineering and the School of Medicine.

Graduate education at UAB's School of Engineering is about advancing your career, whether your goal is engineering practice, industrial research, further studies, or academia. The Master of Engineering (MEng) and Masters of Science in Engineering Management (MSEM) emphasize specialized skills in engineering management, information management, leadership, construction, structures, sustainable smart cities, and safety. Our research-based masters of science and doctoral programs bring students and faculty together with medical professionals, practicing engineers, business leaders, and scientists to push the envelope and discover new, innovative solutions for the challenges of our world.

ASEM-Adv Safety Engineering Courses

ASEM 601. ASEM Seminar. 0 Hours.
Seminar focusing on student research and guest presentations of various topics of interest to safety and risk management engineers and safety professionals.

ASEM 610. Introduction to System Safety - Prevention through Design. 3 Hours.
This course sets the foundation for the ASEM program by providing an overview of all major topic areas and an introduction to many of the tools and approaches to system safety, management systems, and human factors. Topics of inquiry include the processes of hazard analysis and risk assessment, error and error-provocative environments, drift, ISO 45001, systems thinking, prevention through design, and decision making. Course content is presented in a research-to-practice format where students apply course content to their own business environment and bring their organization into the classroom. Guest lecturers from diverse backgrounds will discuss their experiences in managing safety in the workplace. Participation in periodic live dialogues is required. The course must be taken during the first semester.

ASEM 611. Hazard Analysis and Waste Elimination. 3 Hours.
Hazards have the potential to cause harm to people, planet, and profits. Hazard analysis is a process that begins with the identification of a hazard and proceeds into an estimate of the severity of harm or damage that could result if the potential is realized and a hazard-related incident occurs (ASSE TR-Z790.001 – 2009). This course examines engineering techniques utilized to systematically and logically identify and analyze hazards in the workplace. These techniques include preliminary hazard list (PHL), preliminary hazard analysis (PHA), and Operating and Support Hazard Analysis (O&SHA). Students work in teams to use the PHA to retrospectively analyze a real-world disaster. Additionally, many hazard analysis processes ultimately end up assigning blame or finding human error as a cause of hazards and accidents. The 5 Principles of Human Performance will be introduced to help students understand how people are a vital part of the system. Students will apply these 5 principles to their team PHA project and to an Individual O&SHA project.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 612. Engineering Risk. 3 Hours.
Engineering risk is defined both quantitatively and qualitatively as an estimate of the probability that a hazard-related incident will occur and of the severity of harm or damage that could result. This course provides students with tools to assess and reduce safety risks in their own company. These tools include risk assessment matrices, probabilistic risk assessment (PRA) measures, including event tree analysis, fault tree analysis, and other prevention through design concepts. The role of a structured, formalized decision analysis process in preventing serious injuries and fatalities is also explored. Students engage in a risk mitigation decision analysis project, which is specific to their company and/or business sector. Guest lecturers from diverse industries discuss their experiences in assessing and managing risk. Live participation in a weekly 1.5 hour online forum is required.
Prerequisites: ASEM 611 [Min Grade: B]

ASEM 613. Human Performance and Engineering Design. 3 Hours.
Companies can miss important opportunities to eliminate waste if they rely primarily on training to prevent human error. This course explores the historical perspective on human error and serious injury. The course material will provide a solid understanding of the principles of occupational biomechanics and human tolerance to injury with focus on human anthropometry and mechanical work capacity. This course also includes studies of human reliability, static analysis of systems in equilibrium and mechanical systems, design and performance. Due to the quantity of back related injuries and related lost time in the workplace, back pain and injury is studied along with the effect of vibration on the human body. Real-world case studies provide for application of the engineering hierarchy of controls: hazard elimination, hazard substitution, engineering controls, warnings, administrative behavior controls, and personal protective equipment. The course also examines the design aspects of ergonomics, the biomechanical engineering basis of injury prevention, and the long-term economic consequences of seemingly minor injuries. In semester projects, students perform incident investigations using biomechanical and other data. After gathering and analyzing data to determine injury causation, they will identify and re-design error-provocative environments in their own workplaces. Guest lecturers from diverse backgrounds will discuss their experiences with human performance and/or biomechanics. Live participation in a weekly 1.5 hour online forum is required.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 614. Engineering Ethics and Acceptable Risk. 3 Hours.
This course explores the economic, social, and political consequences of safety risk and considers provocative real-world dilemmas: What is acceptable risk? Are the fundamental canons of engineering ethics and safety ethics contrary to the concept of acceptable risk? What is the worth of human life? Students will conduct critical reviews of corporate safety and ethics policies from their own company. Real-world case studies provide the framework for exercises and are used throughout course discussion boards, assignments, and dialogues. Participation in periodic live dialogue is required.
Prerequisites: ASEM 610 [Min Grade: B](Can be taken Concurrently)

ASEM 615. Leading through Climates of Change. 3 Hours.
All progressive companies are moving toward greater sustainability - protecting people, planet, and profits. To guide their companies through these changes and integrate safety into the priorities at the executive level, safety engineers and professionals must have strong leadership skills. This course explores engineering leadership best practices, including the eight steps of transformational leadership - creating a sense of urgency, creating a guiding coalition, developing a vision and strategies, communicating the vision, empowering broad-based action, generating short term wins, consolidating gains and anchoring the culture. This course also explores the concept of Resilience Engineering and helps students understand the impacts of socio-technical risks. Guest lecturers from diverse industries discuss their experiences in managing change in today's global business environment. Live participation in a weekly 1.5 hour online forum is required.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 616. Policy Issues in Prevention through Design. 3 Hours.
This course provides an overview of best practices in four major policy areas: (1) cost-benefit analysis; (2) corporate culture and the "HR Department"; (3) standards, codes, and regulations; and (4) strategic alliance development. Case studies are used to illuminate both the role of engineers and other safety professionals in shaping public policy on the local, national and international levels and the ethical challenges they encounter. The significance of an organization's corporate culture in developing and implementing advanced safety management plans is also explored. Students conduct "gap analyses" of their company's policies by comparing them to best practices and identifying unintended consequences of poor safety policy in their own business and industry sector. Students will engage in discussion board posts on contemporary policy issues and participate in exercises related to federal rulemaking. Guest lecturers from diverse backgrounds will discuss their experiences with policy issues. Live participation in a weekly 1.5 hour online forum is required.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 617. Crisis Leadership. 3 Hours.
Leadership requires more than the predication, control, and management of the vast network of influences that make up our work, especially in times of crisis. By its nature, a crisis is an unpredicted event that requires sensemaking and innovation to go beyond immediate recovery, to step forward into learning. We can only do this when we value, trust, and communicate with the people in our systems. This course will explore why complex adaptive systems are different and may be understood and influenced by leadership at all levels before, during, or after a crisis. Students will assess their own organizational culture through the artifacts, espoused values, and deep assumptions and learn to shape these through relationships, sensemaking, and divergent thinking. This course includes two-week long learning modules based on a combination of written discussion boards that emphasize academic rigor, small group dialogues, network mindmapping, and dynamic online Zoom classes with the professors.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 619. Capstone Project - Part 1. 3 Hours.
This course is designed to understand how to apply many of the ASEM topics and bring to bear the competencies acquired through the program. Part of this is developing an understanding of the complex nature of human contributions. Students will be challenged to correlate learnings from the ASEM Program that lead to the creation of safer work systems and in so doing develop a concept for their capstone project.
Prerequisites: ASEM 612 [Min Grade: B] and (ASEM 613 [Min Grade: B] or ASEM 614 [Min Grade: B] or ASEM 615 [Min Grade: B] or ASEM 616 [Min Grade: B] or ASEM 617 [Min Grade: B] or ASEM 628 [Min Grade: B](Can be taken Concurrently)

ASEM 620. Capstone Project - Part 2. 3 Hours.
Accident investigations are an inevitable part of most industries, yet most incident analysis is based on models that were developed many decades ago. Current research indicates that 80% of accidents are attributed to human error. Yet few tools or processes are designed to examine the context of human actions. Human interactions exist in complex systems, which are by nature unpredictable. When we look at human involvement, we find that actions are influenced by conditions extant in the system. The goal of this course is to discover the importance of dedicating time and resources to understanding why humans are integral to safety in complex systems. Students will learn both the theory and practical application of new techniques that expand the ability of organizations to learn from events. Students will explore the history of accident investigation, its influence on culture, the importance of context in the evaluation of human actions, the inclusion of complex narratives in reports, and how to present their findings to leadership and the field. Overall, students will come away with a more practical ability to help their organization learn from events. The course structure is focused on case study analysis, peer-to-peer learning and research. Questions are designed to challenge current understanding of the human contribution to accidents and why actions or decisions made sense to those involved at the time.
Prerequisites: ASEM 617 [Min Grade: B] and ASEM 619 [Min Grade: B]

ASEM 626. Learning-Based Response to Organizational Accidents and Incidents. 3 Hours.
Accident investigations are an inevitable part of most industries, yet most incident analysis is based on models that were developed many decades ago. Current research indicates that 80% of accidents are attributed to human error. Yet few tools or processes are designed to examine the context of human actions. Human interactions exist in complex systems, which are by nature unpredictable. When we look at human involvement, we find that actions are influenced by conditions extant in the system. The goal of this course is to discover the importance of dedicating time and resources to understanding why humans are integral to safety in complex systems. Students will learn both the theory and practical application of new techniques that expand the ability of organizations to learn from events. Students will explore the history of accident investigation, its influence on culture, the importance of context in the evaluation of human actions, the inclusion of complex narratives in reports, and how to present their findings to leadership and the field. Overall, students will come away with a more practical ability to help their organization learn from events. The course structure is focused on case study analysis, peer-to-peer learning and research. Questions are designed to challenge current understanding of the human contribution to accidents and why actions or decisions made sense to those involved at the time.
Prerequisites: ASEM 617 [Min Grade: B]

ASEM 627. Communication in Safety Systems. 3 Hours.
Communication plays a powerful role in creating safety in the work environment. Effective language increases communication and can lead to individual and organizational learning during safety training, real-time work, and post-mission analysis. However, the meaning of our language is not constant – it changes based on the experience of the worker, the context of the event, and the culture that surrounds the work environment. Language can become ineffective, or even damaging, when meanings differ or go unchallenged. This can occur when definitions are assumed, linguistic shortcuts are taken, or when language bias demands a singular interpretation. Engineers work with mechanical systems, which can be defined by a specific language: e.g. binary oppositions, like turning a switch ‘on’ or ‘off’. However, engineers also work with other people and must take human factors into account, including effective communication. This is the case with safety specialists, who help create the system architecture and develop practical training for workers in risk and safety. These specialists may be expected to participate in accident investigations or incident reviews, which can be unintentionally biased by the language used, which lead away from learning opportunities.
Prerequisites: ASEM 617 [Min Grade: B]

ASEM 628. Electrical Systems Safety. 3 Hours.
There is a subset of occupational hazards characterized as low frequency, but with very high consequence (potential for catastrophic loss, fatality or permanent disabling injury). A mishap involving unintentional exposure or contact with electrical energy is one of the low frequency/high consequence exposures. We live in an electrical world, with electrical hazards embedded in nearly every aspect of daily living – at home, at work, in public places, and in recreational activities. This course explores hazards, risks and context of electrical mishaps coupled with a systems safety engineering approach to manage the risks. Course content is presented within the framework of real-world case studies from a variety of industry sectors, including, but not limited to, manufacturing, utilities, and health care and includes several guest lectures by leaders in the profession. Students apply course content to their own business environment. Live participation in a weekly 1.5 hour online forum is required.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 630. Machinery Safety Management System. 3 Hours.
Safeguarding technology and requirements has come a long way since the Industrial Revolution. Despite this progress, the lack of effective machine guarding and management has continuously been named one of OSHA’s topmost-cited violations. Most businesses assume that the machine manufacturer and installer have met safety compliance requirements, but have they? Some site safety professionals use a standard general safety checklist to verify machine safety requirements but is this enough? The goal of this course is to equip the student with working knowledge of machine safety through understanding and applying key machine safety compliance standards, e.g. ANSI B11.0, ANSI B11.19, NFPA 79, and ISO 13849-1. This course will focus on and apply to power-driven machines used to produce or process material. Within the course, students will evaluate their current machine management systems to determine obstacles, best practices, and solutions to further develop their knowledge of machine technology and management. Students will conduct a machine task-based risk assessment, utilize the hierarchy of control to select risk reduction measures, and verify and test selected safeguards to mitigate risks to an acceptable level. To ensure that the machine safety management process is sustainable, students will utilize ANSI Z10 or ISO 45001 to develop a machine safety management system outline to be used at their site or within a company.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 640. Introduction to Model-Based Safety Assessments. 3 Hours.
This course provides students an introduction to model-based engineering and methods to assess holistic safety risks in their own company. These tools include requirements development, functional decomposition, design architecture, probabilistic risk assessment (PRA) measures, including, failure mode effects and criticality analysis (FMECA), fault tree analysis (FTA), and other safety engineering concepts. The role of a structured, formalized model-based engineering process, used to identify and mitigate hazards, is explored. Students engage in a rigorous model-based safety analysis project.
Prerequisites: ASEM 612 [Min Grade: B]

ASEM 690. Special Topics in (Area). 1-6 Hour.
Special Topics.

ASEM 691. Individual Study in (Area). 1-6 Hour.
Individual study.

BME-Biomedical Engineering Courses

BME 520. Implant-Tissue Interactions. 3 Hours.
An overview of implant biocompatibility including tissue histology, histopathology of implant response and the regulatory process for medical devices.

BME 524. Current Topics in Stem Cell Engineering. 3 Hours.
This course is designed for students interested in the field of stem cells, regenerative medicine, and tissue engineering using stem cells and stem cell derived cells. The course will introduce the role of stem cells in tissue growth and development, the theory behind the design and in vitro construction of tissue and organ replacements, and the applications of biomedical engineering principles to the treatment of tissue-specific diseases. Students will have hands on experience on culturing and analyzing stem cells, stem cell differentiation, analysis of functional and physiological properties of differentiated cells, and fabricating basic engineered-tissues.

BME 535. Tissue Engineering. 3 Hours.
Principles underlying strategies for regenerative medicine such as stem cell based therapy, scaffold design, proteins or genes delivery, roles of extracellular matrix, cell-materials interactions, angiogenesis, tissue transplantation, mechanical stimulus and nanotechnology.

BME 543. Medical Image Processing. 3 Hours.
Fundamental topics of medical image processing to practical applications using conventional computer software.

BME 544. Machine Learning for Biomedical Engineering Applications. 3 Hours.
This course provides the introduction to the practical aspects of machine learning such that the students can apply some basic machine learning techniques in simple biomedical engineering problems. The course also provides the principle of machine learning 'thinking process' for the next machine learning – AI courses and more in-depth machine learning studies. By 'thinking process', at the beginning, it is better to view machine learning like human learning. Students who have experience with Data Mining may further understand the fundamental differences between Machine Learning and Data Mining, although these two fields share many concepts and techniques. Also, the student will learn fundamental theories in machine learning to be able to develop new machine learning techniques and research machine learning in biomedical engineering.

BME 550. Computational Neuroscience. 3 Hours.
This course examines the computational principles used by the nervous system. Topics include: biophysics of axon and synapse, sensory coding (with an emphasis on vision and audition), planning and decision-making, and synthesis of motor responses. There will be an emphasis on a systems approach throughout. Homework includes simulations.

BME 555. NextGen-BioMed Bootcamp: Lab Skills for Biomed Research. 3 Hours.
The course will provide students with a solid foundation in the principles, methods, and techniques used in biomedical research. The course will cover a range of topics, including experimental design, cell and molecular biology techniques, immunological techniques, animal models and in vivo studies, and laboratory safety and good laboratory practices.

BME 561. Bioelectric Phenomena. 3 Hours.
Quantitative methods in the electrophysiology of neural, cardiac and skeletal muscle systems.

BME 562. Cardiac Electrophysiology. 3 Hours.
Experimental and computational methods in cardiac electrophysiology, ionic currents, action potentials, electrical propagation, the electrocardiogram, electromechanical coupling, cardiac arrhythmias, effects of electric fields in cardiac tissue, defibrillation, and ablation.

BME 565. Mechanobiology. 3 Hours.
The overall course objective is to develop understanding of mechanobiological processes in cells as they relate to both development and disease pathways. The course will focus on cancer and vascular biology, however there is significant overlap of these pathways with developmental signaling pathways. Students will learn not only molecular biology techniques for characterizing mechanobiology and cell phenotype but also be able to describe biomechanical analysis protocols including micropipette aspiration, atomic force microscopy, traction force microscopy, and optical/magnetic tweezers. The course will include comprehensive literature reviews relevant to the subject area. Students will present formal presentations on articles discussing mechanobiology topics; students will prepare a written report in the style of a commentary article on a published journal article discussing a relevant mechanobiological project.

BME 571. Continuum Mechanics of Solids. 3 Hours.
Matrix and tensor mathematics, fundamentals of stress, momentum principles, Cauchy and Piola-Kirchoff stress tensors, static equilibrium, invariance, measures of strain, Lagrangian and Eulerian formulations, Green and Almansistrain, deformation gradient tensor, infinitesimal strain, constitutive equations, finite strain elasticity, strain energy methods, 2-D Elasticity, Airy Method, viscoelasticity, mechanical behavior of polymers.

BME 572. Industrial Bioprocessing and Biomanufacturing. 3 Hours.
This course will introduces students to the growing industries related to biomedical, biopharmaceutical and biotechnology. It is targeted to offer the students marketable skills to work in a vital area of economic growth and also convey some of the challenges and opportunities awaiting.

BME 590. Special Topic in Biomedical Engineering. 1-3 Hour.
Special Topic in Biomedical Engineering.

BME 591. Individual Study in Biomedical Engineering. 1-6 Hour.
Individual Study in Biomedical Engineering.

BME 601. Seminar in Biomedical Engineering. 1 Hour.
Current topics in biomedical engineering technology and applications.

BME 605. Insights to Innovations BME Journal Club. 1 Hour.
Insights to Innovations (i2i) BME Scholar's Pulse is a Journal Club designed to facilitate critical analyses and discussion of current research in the field of biomedical engineering. Students will learn how to conduct literature searches, read and evaluate scientific articles, and present research findings effectively. Students will develop their presentation and discussion skills and gain a deeper understanding of the various subfields of biomedical engineering.

BME 617. Engineering Analysis. 3 Hours.
Advanced ordinary differential equations, transform techniques, scalar and vector field theory, partial differential equations (heat, wave, Laplace). Students who register for this course are expected to have successfully completed courses in calculus and ordinary differential equations.

BME 623. Skin and Bone Regeneration. 3 Hours.
Study of principles of healing, methods to enhance, and clinical applications.

BME 625. Immune-Engineering: Biomaterial Toolbox for Immune-Modulation. 3 Hours.
This course introduces immunology and engineering approaches to study and control immune response using biomaterials. The course is geared towards students/engineers without a deeply established background in immunology. Basic principles in immunology will be covered and contemporary research directions will be discussed based on articles from the primary literature. Biomaterials will be presented as a tool for modifying immune responses.

BME 634. Dynamical Biological Systems. 3 Hours.
This course considers the dynamics of biological systems at a variety of levels from the cell/molecular to the circuit and system levels. Biological systems are typically nonlinear and their behavior is not usually analytically solvable. Yet it is possible to use the tools of nonlinear dynamical systems theory to approach understanding. In addition, it is important to understand how robust control theory can be applied to describe systems for which an exact mathematical model does not exist. The goal of this course is to examine a number of examples in some detail to gain insight into the dynamics of regulation in biology.

BME 643. Biomedical Imaging-Oncology. 3 Hours.
Advanced and quantitative medical imaging and image processing to understand biological processes related to cancer biology. Medical imaging technology will include molecular, functional and anatomical imaging related to the hallmarks of cancer.

BME 664. Neural Computation. 3 Hours.
This course examines the principal theoretical underpinnings of computation in neural networks. Emphasis will be placed on understanding the relationship between the different approaches: dynamical systems, statistical mechanics, logic, Kalman filters, and likelihood/Bayesian estimation.

BME 665. Computational Vision. 3 Hours.
This course approaches the study of biological and artificial vision from a theoretical perspective beginning with a comparative survey of visual systems and then examining vision algorithms and architectures.

BME 670. Quantitative Physiology. 3 Hours.
Study of physiological problems using advanced mathematical techniques. Topics covered include: mechanics, fluid dynamics, transport, electrophysiology of cell membranes, and control systems.
Prerequisites: BME 517 [Min Grade: C] or BME 617 [Min Grade: C] or BME 717 [Min Grade: C] or ME 661 [Min Grade: C] or ME 761 [Min Grade: C]

BME 672. Cellular Therapy. 3 Hours.
Introduction to research in cellular therapy, its clinical applications, and its potential for commercialization. Students will learn fundamental mechanisms, become familiar with the progress of several successful therapies that use human T cells and stem cells, and learn the challenges and opportunities for future biopharmaceutical and biotechnology industries.

BME 673. Lab Rotation. 3 Hours.
Entering BME graduate students will work in the laboratories of 2 or 3 potential research mentors. The duration of each rotation period will be by mutual agreement between student and faculty but must be at least 4 weeks. The goal is for students to match with their primary research mentor by the end of the course.

BME 680. Biomolecular Modeling. 3 Hours.
Molecular modeling principles and applications. Students will perform hands-on exercises using molecular modeling tools and software. Students will learn the critical relationships among structure, function, and thermodynamic driving forces in structural biology and become able to utilize molecular modeling techniques to explore biological phenomena at the molecular level.

BME 690. Special Topics in Biomedical Engineering. 1-6 Hour.
Special Topics in Biomedical Engineering.

BME 691. Individual Study in Biomedical Engineering. 1-6 Hour.
Individual Study in Biomedical Engineering.

BME 693. Internship in Biomedical Engineering. 1-6 Hour.

BME 697. Journal Club. 1-3 Hour.
Journal Club.

BME 698. Non-Thesis Research. 1-12 Hour.

BME 699. Thesis Research. 1-12 Hour.
Prerequisites: GAC M

BME 701. Seminar in Biomedical Engineering. 1 Hour.
Current topics in biomedical engineering technology and applications.

BME 705. Insights to Innovation BME Journal Club. 1 Hour.
Insights to Innovations (i2i) BME Scholar's Pulse is a Journal Club designed to facilitate critical analyses and discussion of current research in the field of biomedical engineering. Students will learn how to conduct literature searches, read and evaluate scientific articles, and present research findings effectively. Students will develop their presentation and discussion skills and gain a deeper understanding of the various subfields of biomedical engineering.

BME 717. Engineering Analysis. 3 Hours.
Advanced ordinary differential equations, transform techniques, scalar and vector field theory, partial differential equations (heat, wave, Laplace).

BME 723. Skin and Bone Regeneration. 3 Hours.
Study of principles of healing, methods to enhance, and clinical applications.

BME 725. Immune-Engineering: Biomaterial Toolbox for Immune-Modulation. 3 Hours.
This course introduces immunology and engineering approaches to study and control immune response using biomaterials. The course is geared towards students/engineers without a deeply established background in immunology. Basic principles in immunology will be covered and contemporary research directions will be discussed based on articles from the primary literature. Biomaterials will be presented as a tool for modifying immune responses.

BME 734. Dynamical Biological Systems. 3 Hours.
This course considers the dynamics of biological systems at a variety of levels from the cell/molecular to the circuit and system levels. Biological systems are typically nonlinear and their behavior is not usually analytically solvable. Yet it is possible to use the tools of nonlinear dynamical systems theory to approach understanding. In addition, it is important to understand how robust control theory can be applied to describe systems for which an exact mathematical model does not exist. The goal of this course is to examine a number of examples in some detail to gain insight into the dynamics of regulation in biology.

BME 743. Biomedical Imaging-Oncology. 3 Hours.
Advanced and quantitative medical imaging and image processing to understand biological processes related to cancer biology. Medical imaging technology will include molecular, functional and anatomical imaging related to the hallmarks of cancer.

BME 764. Neural Computation. 3 Hours.
This course examines the principal theoretical underpinnings of computation in neural networks. Emphasis will be placed on understanding the relationship between the different approaches: dynamical systems, statistical mechanics, logic, Kalman filters, and likelihood/Bayesian estimation.

BME 765. Computational Vision. 3 Hours.
This course approaches the study of biological and artificial vision from a theoretical perspective. We begin with a comparative survey of visual systems, and will examine vision algorithms and architectures.

BME 770. Quantitative Physiology. 3 Hours.
Study of physiological problems using advanced mathematical techniques. Topics covered include: mechanics, fluid dynamics, transport, electrophysiology of cell membranes, and control systems.
Prerequisites: BME 517 [Min Grade: C] or BME 617 [Min Grade: C] or BME 717 [Min Grade: C] or ME 661 [Min Grade: C] or ME 761 [Min Grade: C]

BME 772. Cellular Therapy. 3 Hours.
Introduction to research in cellular therapy, its clinical applications, and its potential for commercialization. Students will learn fundamental mechanisms, become familiar with the progress of several successful therapies that use human T cells and stem cells, and learn the challenges and opportunities for future biopharmaceutical and biotechnology industries.

BME 773. Lab Rotation. 3 Hours.
Entering BME graduate students will work in the laboratories of 2 or 3 potential research mentors. The duration of each rotation period will be by mutual agreement between student and faculty, but must be at least 4 weeks. The goal is for students to match with their primary research mentor by the end of the course.

BME 780. Biomolecular Modeling. 3 Hours.
Molecular modeling principles and applications. Students will perform hands-on exercises using molecular modeling tools and software. Students will learn the critical relationships among structure, function, and thermodynamic driving forces in structural biology and become able to utilize molecular modeling techniques to explore biological phenomena at the molecular level.

BME 790. Special Topics in Biomedical Engineering. 1-6 Hour.
Special Topics in Biomedical Engineering.

BME 791. Individual Study in Biomedical Engineering. 1-6 Hour.
Individual Study in Biomedical Engineering.

BME 793. Internship in Biomedical Engineering. 1-6 Hour.

BME 797. Journal Club. 1-3 Hour.
Journal Club.

BME 798. Non-Dissertation Research. 1-12 Hour.

BME 799. Dissertation Research. 1-12 Hour.
Prerequisites: GAC Z

CE-Civil Engineering Courses

CE 515. Building Information Modeling (BIM). 3 Hours.
This class provides an introduction to the virtual world of design and construction. Topics covered include uses for technology, what is BIM, and have a focus on AutoCAD and Revit Software. An emphasis is placed on the use of these tools and their practical applications to the real world environment. Students are provided with the software through the Autodesk Student community and are required to complete a Multi-Step term Project.

CE 516. Mechanical Vibrations. 3 Hours.
Free and forced single-degree-of-freedom systems. Multi-degree-of-freedom systems. Damped, forced two-degree-of- freedom systems. Simple continuous systems.

CE 520. Advanced Mechanics. 3 Hours.
Variation of stress at point including determination of principal and maximum shear stresses. Basic problems involving symmetrical deformation; thickwall cylinders, spheres, and rotating disk. Torsions of noncircular sections. Curved beams. Failure Theories. Unsymmetrical bending and shear center.

CE 526. Foundation Engineering. 3 Hours.
Application of principles of soil mechanics to: determine bearing capacity and settlement of spread footings, mats, single piles and pile groups; site investigation, evaluate data from field and laboratory tests; estimation of stresses in soil masses; lateral resistance of piles and pile groups; retaining walls, sheetpiles and coffer-dams.

CE 530. Water Supply/Drainage Design. 3 Hours.
Water requirements; wastewater characteristics. Hydraulics and design of sewers; distribution, and reuse of water. Development of water supplies; design considerations.

CE 530L. Water Supply/Drainage Design Laboratory. 0 Hours.
The laboratory exercises are designed to assist the student in the investigation of water supply and drainage design including the analysis of water networks, pipe network design, storm-water and sewer collection network design, flow path visualization, hydraulic jump, flow over weirs, channel design, and basin modeling. Companion lab to CE 530 and must be taken concurrently.

CE 531. Energy Resources. 3 Hours.
Overview of the various energy resources: oil, natural gas, coal, nuclear, hydro, solar, geothermal, biomass, wind, and ocean energy resources, in terms of supply, distribution, recovery and conversion, environmental impacts, economies, policy, and technology. Concepts and opportunities for energy conservation; including electric power generation, changing role of electric utilities, transportation applications, and energy use in developing countries. Field trips.

CE 533. Solid and Hazardous Wastes Management. 3 Hours.
Overview of waste characterizations, regulations, and management options.

CE 534. Air Quality Modeling and Monitoring. 3 Hours.
Atmospheric pollutants; effects, reactions, and sources. Air pollution meteorology and dispersion modeling. Ambient monitoring.

CE 537. Environmental Experimental Design and Field Sampling. 3 Hours.
Experimental design, sensitivity analyses, water sampling, and flow monitoring. Receiving water chemical reactions. Field investigations.

CE 537L. Environmental Experimental Design and Field Sampling Lab. 0 Hours.
Lab experiences in environmental experimental design and field sampling.

CE 542. Highway Materials and Construction. 3 Hours.
Properties of materials used in highway construction. Construction methods and management.

CE 543. Pavement Design & Construction. 3 Hours.
Analysis of stresses and strains in pavement systems. Design and construction of flexible and rigid pavements, base courses and subgrades. Effects of loading on pavement life.

CE 544. Civil Engineering Analysis II. 3 Hours.
Sampling and experimental design. Hypotheses testing. Decision Analyses. Multiple regression analyses. Nonparametric methods. Analysis of experimental data in civil engineering research; regression, experimental design, non-parametrical analysis.

CE 545. Engineering the Built Environment. 3 Hours.
This service learning course explores the effects the built environment has on urban function, connectivity, community health, and the well-being of its residents. Students work directly in Birmingham neighborhoods learning how to assess different components of the built environment, including transportation, green spaces, lighting, and blight, and to estimate their impacts on community health and well-being. Students then work with representatives from the city, neighborhoods, and local industry to propose engineering solutions, develop realistic cost estimates, assess potential benefits, and develop implementation plans.

CE 546. Green Infrastructure and Transportation. 3 Hours.
This course covers policy and technical issues related to sustainable transportation. The course begins by discussing the concepts, viewpoints, and fundamentals essential for understanding sustainable transportation planning. Tools used to assess sustainability of transportation facilities and neighborhoods are introduced next. The course also presents design options in support of green infrastructure and transportation, including livable street design, and traffic calming applications. The course is expected to expand students' knowledge base on sustainable transportation issues and help them understand the concept of sustainable transportation toward the development of sustainable smart cities.

CE 547. Principles of Sustainable Development. 3 Hours.
The course presents the concepts, viewpoints and fundamentals essential for understanding the urban sustainable development agenda. Students will review basic earth sciences to better evaluate the impact our anthropogenic activities have on the natural environment and therefore how to minimize adverse future outcomes. Throughout the course case studies of sustainable developments will be used to illustrate the value, challenges and limitations of this concept. In the end, students will possess the knowledge base needed to help advance sustainable smart cities development.

CE 553. Design of Wood Structures. 3 Hours.
This course will give students an understanding of structural wood materials, both sawn lumber and a number of engineered wood materials. The main objective of the course is to learn how to design wood structures using these materials, including the design of beams, columns, connections, roof diaphragms, and shear walls. The requirement of the National Design Specification for Wood Structures will be addressed.

CE 554. Design of Masonry Structures. 3 Hours.
Design and detailing of masonry structures. Nomenclature, properties, and specifications for components. Design of assemblages, simple masonry structures, unreinforced and reinforced elements, and complex masonry structures.

CE 556. Prestressed Concrete Design. 3 Hours.
Principles and concepts of design in prestressed concrete including elasticand ultimate strength analysis for flexural, shear, bond, and deflections. Principles of concordance and linear transformation for indeterminate prestressed structures.

CE 557. Concrete Technology. 3 Hours.
Properties of concrete in relation to specifying, purchasing, and evaluating concrete materials. Fresh and hardened concrete properties. Concrete mix design procedures. Effects of finishing, curing, weather conditions, and various construction procedures. Ready mix concrete production and field placement techniques. Specifications writing to ensure good quality concrete and field inspection procedures. Case studies of problems in concrete construction.

CE 560. Structural Mechanics. 3 Hours.
Elastic beam deflections, beam columns, lateral torsional buckling, column stability, plastic design, plate bending, yield line theory.

CE 561. Introduction to the Finite Element Method. 3 Hours.
Concepts and applications of the finite element method. Development and applications of basic finite elements. Software use.

CE 562. Advanced Structural Analysis. 3 Hours.
Analysis of indeterminate structures using classical and matrix methods. Use of large-scale computer programs.

CE 564. Structural Dynamics. 3 Hours.
Closed form and numerical solutions to single-degree-of-freedom structural models. Analysis of multistory frames. Computer application and seismic analysis. Techniques of modal analysis.

CE 565. CE Construction Documents. 3 Hours.
Introduction to Civil Engineering design and construction documents including drawings, specifications, contracts, and testing reports. Overview of civil infrastructure and project types, including the civil engineer's role in the preparation, certification, and use of construction documents. Construction topics include measurement, quantity estimating, and engineering budgets.

CE 567. Wind and Seismic Loads. 3 Hours.
Methods for calculating loads on structures caused by extreme winds and earthquakes. Calculation of wind loads on various types of structures according to theory and codes. Determination of earthquake loads on structures using structural dynamics and codes.

CE 568. Bridge Engineering. 3 Hours.
Bridge loads, steel beam bridges, composite beam bridges, bridge bearings, reinforced and prestressed concrete slab and T-beam bridges, bridge evaluations and ratings, upgrade methodologies, computer applications.

CE 570. International Research Experience. 3 Hours.
The International Research Experience for Students (IRES) program provides the opportunity for undergraduate and graduate students to participate in hands-on engineering research in an international setting. Students perform research on an approved topic related to civil engineering design in an international environment. Students select a topic, perform a detailed literature review, and work with mentors from UAB and the international host institution to develop research objectives and a detailed research plan. The course will culminate in a 6-8 week visit to the international host institution, during which time students will conduct hands-on research with their mentors and prepare final reports.

CE 575. Construction Safety and Health Management. 3 Hours.
This course covers various causes of construction accidents and the adopted strategies to prevent worksite injuries and illnesses. Other topics covered include workers' compensation, OSHA standards for the construction industry, economics of construction safety management, temporary structures, system safety, ergonomic applications, health hazards, and the development of a safety program.

CE 580. Introduction to Water and Wastewater Treatment. 3 Hours.
Physical unit operations, and chemical/biological unit processes for water and wastewater treatment. Design of facilities for treatment. Treatment and disposal of sludge.

CE 585. Engineering Hydrology. 3 Hours.
Hydrologic principles including hydrology cycle, precipitation data, and stream-flow measurements. Applications to engineering problems; stream-flow analysis and watershed management.

CE 590. Special Topics in Civil Engineering. 1-6 Hour.
Special Topic in Civil Engineering.

CE 591. Individual Study in Civil Engineering. 1-6 Hour.
Individual Study in Civil Engineering.

CE 597. Construction Engineering Management. 3 Hours.
Study of construction management services that include: project planning, scheduling, estimating, budgeting, contract administration, agreements, and ethics. Emphasis is made on the management of manpower, materials, money and machinery.

CE 600. Sustainable Construction. 3 Hours.
Study of sustainable construction techniques and best practices. Provides an understanding of the interdependencies between planning, designing, building, operating, and demolishing the built environment and their impacts on the natural environment. Course topics will include: (1) issues of recourse efficiency, economics, ethics, waste, human health, environmental justice, and industrial ecology; (2) alternative practices that significantly reduce adverse environmental impacts of built infrastructure, and (3) explore past and present thinking of engineering practitioners in this newly emerging discipline.

CE 605. Project Management. 3 Hours.
Presents the theory and practice of project management as a distinct discipline with applications in time, cost, and performance management. Managerial, organizational, behavioral and cost benefit aspects of project management are covered, as well as various applied models for organizing, executing, and monitoring a project. Basic estimating techniques to determine cost and time for construction work packages are discussed followed by scheduling model techniques to include the Critical Path Method (CPM), Precedence Diagramming Method (PDM), Program Evaluation and Review Technique (PERT), and Gantt charts.

CE 607. Engineering Entrepreneurship. 3 Hours.
Course focuses on the entrepreneurial engineer--a new type of engineer who needs a broad range of business skills and knowledge above and beyond a strong science and engineering background. The course will introduce engineering students to the key aspects of engineering entrepreneurship including business planning, solving problems, risk taking, financing, marketing, and entrepreneurial leadership. The students will also be introduced to the many opportunities and challenges that accompany starting and operating an entrepreneurial venture. Entrepreneurial company leaders will present their experiences and share their leadership styles as part of the course.

CE 608. Green Building Design. 3 Hours.
Quantitative introduction to the principles of "Green Building Design". Provides students an understanding of the interdependencies between economics, technology, design, building occupation and the subsequent impact on the natural environment. Course will emphasize green building materials, new technologies, and sustainable construction methods. Course also includes LEED Case Studies (industrial, commercial, residential, and institutional examples).

CE 610. The Engineered Environment. 3 Hours.
Fundamentals of environmental engineering as they apply to the construction of the built environment and contemporary issues faced by engineers in developing nations such as Egypt. Topics include air pollution, solid waste management, water treatment, environmental ethics, etc.

CE 612. Theory of Elasticity. 3 Hours.
Equations of linear reduction to plane stress, plane strain, and generalized plane strain. Airy and love stress functions in solution of problems.

CE 615. Theory of Elastic Stability. 3 Hours.
Static stability of bars, beams, trusses, and rigid frames. Dynamic stability of bars. Energy method applied to bucking problems. General theory of elastic stability.

CE 617. Theory of Plates and Shells. 3 Hours.
Linear theory and solutions of plates and various shapes. Large deflection theory and solutions of rectangular and circular plates. Membrane and bending theories of shells. Solutions of problems in conical, cylindrical, and spherical shell.

CE 621. Transportation Engineering Seminar. 1 Hour.
Seminar focusing on student research and guest presentations of various topics of interest to graduate transportation engineering students.

CE 622. Traffic Flow Theory. 3 Hours.
Microscopic and macroscopic traffic flow characteristics. Traffic flow analytical techniques including car-following models, traffic stream models, shock wave analysis, queuing analysis and gap acceptance. Simulation models for network analysis.

CE 623. Non-Motorized Transportation Design and Planning. 3 Hours.
Urban planning principles that support non-motorized transportation, local bicycle or pedestrian plans, non-motorized transportation safety related considerations, non-motorized transportation design including traffic calming techniques, procedures for capacity analysis of pedestrian facilities.

CE 624. Simulation Models for Transportation Applications. 3 Hours.
Basic concepts of simulation models for analysis and optimization of transportation systems. Experimentation with planning simulation models and traffic models for signal timing and capacity analysis.

CE 625. Intelligent Transportation Systems. 3 Hours.
Legal, institutional and planning issues related to intelligent transportation systems. System architecture, communication techniques, advanced user services, intermodal systems, connected and autonomous vehicles applications.

CE 631. Environmental Law. 3 Hours.
Law as it applies to the practicing environmental engineer. New and emerging regulations.

CE 632. Industrial Waste and Wastewater Treatment. 3 Hours.
Solid wastes and wastewaters from various industries. Assessment of treatability, system design, and equipment selection.

CE 633. Solid and Hazardous Waste Management. 3 Hours.
Provides students a quantitative introduction to solid and hazardous waste characterizations, international regulations, and management options. Course topics to include (1) Solid waste management hierarchy (reduce, reuse, recycle, recovery, responsible disposal); (2) Dry tomb landfill design; and (3) Hazardous waste identification and treatment/disposal.

CE 636. Stormwater Pollution Management. 3 Hours.
Quality and quantity of stormwater. Receiving water problems and sources of pollutants. Runoff quality and quantity characterizations. Erosion control. Selection and design of controls; regulations.

CE 638. Water and Wastewater Chemistry. 3 Hours.
Aquatic chemistry. Chemical behavior of pollutants in receiving waters. Fate of common pollutants. Chemical kinetics in natural waters. Photochemical reactions. Modeling of wastewater discharges.

CE 639. Sediment Sources and Controls. 3 Hours.
Erosion and sediment transport areas; design of common erosion control practices.

CE 640. Wastewater Treatment Engineering. 3 Hours.
Wastewater sources and characteristics. Design and operation of wastewater treatment facilities, including grit removal, oil and grease removal, dissolved air flotation, activated sludge process, trickling filters, and rotating biological contractors, stabilization ponds and aerated lagoons, anaerobic processes for wastewater treatment and sludge digestion. Ultimate disposal of wastewater residues and considerations of discharge criteria.

CE 643. Pavement Design and Construction. 3 Hours.
Design and construction of flexible and rigid pavements. Topics include stress and strain responses, design parameters, AASHTO and NAPA design procedures, pavement construction, pavement rehabilitation, and maintenance techniques.

CE 646. Traffic Engineering Operations. 3 Hours.
Highway and intersection capacity analysis, traffic signal timing and phasing, signal coordination, freeway operations, non-signalized traffic control techniques.

CE 648. Urban and Transportation Planning. 3 Hours.
Land use planning for transportation systems; trip generation, trip distribution, modal split, and traffic assignment.

CE 649. Engineering Liability. 3 Hours.
Laws related to liability for engineering design in the context of product liability and construction projects; roles and liabilities between various parties involved in construction projects.

CE 650. Advanced Structural Steel. 3 Hours.
Beams, columns, tension members, and connections; current research.

CE 655. Advanced Reinforced Concrete. 3 Hours.
Beam, column, and slab actions; current research.

CE 658. Engineering Management. 3 Hours.
Management techniques for the practicing engineer.

CE 663. Finite Element Methods. 3 Hours.
Theory and applications in structural mechanics. Plane stress, plane strain, axisymmetric problems, solids, plates, shells, nonlinear systems.

CE 681. Environmental Chemistry. 3 Hours.
Chemical equilibrium, acid/base, chemical concepts in pollutant behavior. Chemical kinetics, redox system, hydrolysis, pesticides, chemical wastes.

CE 682. Water Treatment Engineering. 3 Hours.
Water sources and characteristics. Design and operations of water treatment facilities. Topics Include lime softening operations, coagulation, flocculation, clarification dissolved air flotation, filtration, disinfection, absorption, ion exchange and sludge management.

CE 683. Water and Wastewater Treatment Processes Lab. 3 Hours.
Construction and evaluation of bench-scale treatment processes. Treatability of water and wastewater. Coagulation of sedimentation, settleability of biological sludge, aerobic biological treatment, chemical treatment, water softening toxicity, disinfection, and sludge treatment processes.

CE 685. Engineering Hydrology. 3 Hours.
Hydrologic principles including hydrologic cycle, precipitation data, and stream-flow measurements. Applications to engineering problems; stream-flow analysis and watershed management.

CE 686. Engineering Hydrogeology. 3 Hours.
Groundwater movement, natural quality, contamination, and restoration. Physical and chemical properties of groundwater. Well hydraulics and flow net analyses. Prevention and control of groundwater contamination.

CE 687. Stormwater Detention Pond Design. 3 Hours.
Stormwater problems and control methods. Urban hydrology prediction procedures for drainage and water quality studies. Detention pond design basics, limitations and multiple benefits.

CE 688. Strategic Management and Leadership Applications in a Global Environment. 3 Hours.
This course is designed to prepare students to face the demanding management and leadership challenges facing construction and engineering industry leaders as competition becomes ever more globalized. The necessity to personally remain trained and relevant in the changing business environment is emphasized. Strategic planning, management and leadership in the built environment requires savvy leaders with exceptionally developed analytical and communications skills suitable for multi-disciplinary and multi-national ventures. Every individual and organization must continually innovate and reinvent to stay competitive. In a competitive environment, a strong working knowledge of the financial markets is essential and students are exposed to multiple lessons presented by financial industry practitioners. Students participate in a group project designed to reinforce the methodology associated with preparing and presenting a dynamic business plan. This course provides the opportunity for students to discuss and research these concepts and to recognize the necessity to think independently, challenge conventional thinking, and visualize alternatives.
Prerequisites: CE 669 [Min Grade: C]

CE 689. Building Information modeling (BIM) Techniques. 3 Hours.
This course provides students with an overview of the evolution of BIM technology in the construction industry followed by hands-on training in the basic application of contemporary BIM software. Students will learn basic modeling skills and how to produce graphical presentations. Advanced applications of BIM technology are discussed and demonstrated. Students will be provided with BIM software and are required to complete a multi-step BIM model as a term project.

CE 690. Special Topics in (Area). 1-3 Hour.
Special Topics (Area).

CE 691. Individual Study in (Area). 1-4 Hour.
Individual Study (Area).

CE 692. CE Capstone Project. 3 Hours.
This course covers specific contemporary topics related to civil engineering practice and knowledge. Capstone project using case studies to apply skills, knowledge, techniques, and concepts developed in prior courses.

CE 693. Applied Research in Civil, Construction, and Environmental Engineering. 3-9 Hours.
Research tools, including elements of experimental design and proposal preparation. Effective communication, literature searches, and exploratory data analysis.

CE 695. International Construction Contracts/Liability. 3 Hours.
Provides an overview of the fundamental aspects of the law that affects construction and engineering companies as well as the project owners. Particular emphasis is placed on contract forms and provisions related to liability for engineering design and construction companies, the roles of the typical participation in the process, and dispute resolution.

CE 697. Master's Project. 3-9 Hours.
A UAB Master's Project must demonstrate evidence of scholarly study and writing that ultimately contributes to the scientific knowledge base. This course is designed to allow students the opportunity to develop original ideas or seek to advance knowledge through theory, conceptualization, design, testing of tools, instruments, or procedures relevant to the practice of civil engineering.

CE 698. Non-Thesis Research. 1-12 Hour.

CE 699. Thesis Research. 1-12 Hour.
Prerequisites: GAC M

CE 712. Theory of Elasticity. 3 Hours.
Equations of linear reduction to plane stress, plane strain, and generalized plane strain. Airy and love stress functions in solution of problems.

CE 715. Theory of Elastic Stability. 3 Hours.
Static stability of bars, beams, trusses, and rigid frames. Dynamic stability of bars. Energy method applied to buckling problems. General theory of elastic stability.

CE 717. Theory of Plates and Shells. 3 Hours.
Linear theory and solutions of plates of various shapes. Large deflection theory and solutions of rectangular and circular plates. Membrane and bending theories of shells. Solutions of problems in conical, cylindrical, and spherical shell.

CE 721. Transportation Engineering Seminar. 1 Hour.
Seminar focusing on student research and guest presentation of various topics of interest to graduate transportation engineering students.

CE 722. Traffic Flow Theory. 3 Hours.
Microscopic and macroscopic traffic flow characteristics. Traffic flow analytical techniques including car-following models, traffic stream models, shock wave analysis, queuing analysis and gap acceptance. Simulation models for network analysis.

CE 723. Non-Motorized Transportation Design and Planning. 3 Hours.
Urban planning principles that support non-motorized transportation, local bicycle or pedestrian plans, non-motorized transportation safety related considerations, non-motorized transportation design including traffic calming techniques, procedures for capacity analysis of pedestrian facilities.

CE 724. Simulation Models for Transportation Applications. 3 Hours.
Basic concepts of simulation models for analysis and optimization of transportation systems. Experimentation with planning simulation models and traffic models for signal timing and capacity analysis.

CE 725. Intelligent Transportation Systems. 3 Hours.
Legal, institutional and planning issues related to intelligent transportation systems. System architecture, communication techniques, advanced user services, intermodal systems, connected and autonomous vehicles applications.

CE 731. Environmental Law. 3 Hours.
Law as it applies to the practicing environmental engineer. New and emerging regulations.

CE 732. Industrial Waste and Wastewater Treatment. 3 Hours.
Solid wastes and waste waters from various industries; assessment of treatability, system design, and equipment selection.

CE 736. Stormwater Pollution Management. 3 Hours.
Quality and quantity of stormwater. Receiving water problems and sources of pollutants. Runoff quality and quantity characterizations. Erosion control. Selection and design of controls; regulations.

CE 738. Water and Wastewater Chemistry. 3 Hours.
Aquatic chemistry. Chemical behavior of pollutants in receiving waters. Fate of common pollutants. Chemical kinetics in natural waters. Photochemical reactions. Modeling of wastewater discharges.

CE 739. Sediment Sources and Controls. 3 Hours.
Erosion and sediment transport in urban areas, design of common erosion control practices.

CE 740. Wastewater Treatment Engineering. 3 Hours.
Wastewater sources and characteristics. Design and operation of wastewater treatment facilities, including grit removal, oil and grease removal, dissolved air flotation, activated sludge process, trickling filters, and rotating biological contractors, stabilization ponds and aerated lagoons, anaerobic processes for wastewater treatment and sludge digestion. Ultimate disposal of wastewater residues and considerations of discharge criteria.

CE 749. Engineering Liability. 3 Hours.
Laws related to liability for engineering design in the context of product liability and construction projects; roles and liabilities between various parties involved in construction projects.

CE 750. Advanced Structural Steel. 3 Hours.
Beams, columns, tension members, and connections; current research.

CE 755. Advanced Reinforced Concrete. 3 Hours.
Beam, column, and slab actions; current research.

CE 758. Engineering Management. 3 Hours.
Management techniques for practicing engineers.

CE 763. Finite Element Methods. 3 Hours.
Theory and applications in structural mechanics. Plane stress, plane strain, axisymmetric problems, solids, plates, shells, nonlinear systems.

CE 781. Environmental Chemistry. 3 Hours.
Chemical equilibrium, acid/base, chemical concepts in pollutant behavior. Chemical kinetics, redox system, hydrolysis, pesticides, chemical wastes.

CE 782. Water Treatment Engineering. 3 Hours.
Water sources and characteristics. Design and operation of water treatment facilities including lime softening operations, coagulation, flocculation, clarification, dissolved air flotation, filtration, disinfection, absorption, ion exchange, and sludge disposal.

CE 783. Water and Wastewater Treatment Processes Lab. 3 Hours.
Construction and evaluation of bench-scale treatment processes. Treatability of water and wastewater. Coagulation of sedimentation, settleability of biological sludge, aerobic biological treatment, chemical treatment, water softening toxicity, disinfection, and sludge treatment processes.

CE 786. Engineering Hydrogeology. 3 Hours.
Groundwater movement, natural quality, contamination, and restoration. Physical and chemical properties of groundwater. Well hydraulics and flow net analyses. Prevention and control of groundwater contamination.

CE 787. Stormwater Detention Pond Design. 3 Hours.
Stormwater problems and control methods. Urban hydrology prediction procedures for drainage and water quality studies. Detention pond design basics, limitations and multiple benefits.

CE 790. Special Topics in (Area). 1-3 Hour.
Special Topics in (Area).

CE 791. Individual Studies (In Area). 1-4 Hour.
Individual Studies in (Area).

CE 793. Applied Research in Civil and Environmental Engineering. 3 Hours.
Research tools, including elements of experimental design and proposal preparation. Effective communication, literature searches, and exploratory data analysis.

CE 797. Civil, Construction, and Environmental Engineering Internship. 6 Hours.
Off-campus internship experience working with industries, utilities, or government agencies. Students taking this course will not be allowed to apply Special Topics or Individual Studies courses toward degree requirements.

CE 798. Non-Dissertation Research. 1-12 Hour.

CE 799. Dissertation Research. 1-12 Hour.
Prerequisites: GAC Z

CECM-Construction Egr Mgmnt Courses

CECM 669. Advanced Project Management. 3 Hours.
Skills generally required for sound project management in a variety of management settings are studied in addition to specific management issues typically associated with engineering and construction companies. Students are introduced to the Project Management Institute's Body of Knowledge (PMBOK). A discussion of corporate organizational structures and the evolving use of project management processes helps establish an appreciation for the role of a Project Manager. The elements of a project and the role and responsibilities of the Project Manager are studied in depth. Students are also acquainted with risk management concepts, financial, labor, safety, equipment, and contracting issues facing managers in the engineering and construction environment. Particular emphasis is placed on individual management strengths and weaknesses, team building, and characteristics of successful companies. One of the primary vehicles for discussion will be small case studies from real companies and the outside reading of one or two relevant topical books.

CECM 670. Construction Estimating and Bidding. 3 Hours.
Provides an overview of typical construction delivery systems and the planning and contracting associated with each. A broad study of estimating methodologies ranging from rough "ball park" estimates to detailed unit pricing is presented focusing on labor, equipment, materials, subcontractors, job conditions, location, overhead, and profit. This course is intended to establish a basic understanding of the estimating process; and therefore, substantial course focus will be placed on the term group project.

CECM 671. Construction Liability & Contracts. 3 Hours.
This course provides an overview of the fundamental aspects of the laws that affect construction and engineering companies as well as the project owners. Particular emphasis is placed on contract forms and provisions related to liability for engineering design and construction companies, the roles of the typical participation in the process, and dispute resolution. Students will learn the importance of contract language negotiations and the impact of project risk transfer.

CECM 672. Construction Methods and Equipment. 3 Hours.
This course provides students a big-picture understanding of the construction methods employed to bring the concepts and designs of architects and engineers to physical reality. The importance of building codes is presented in the course material. Detailed study of typical building materials, design details, and construction methods are presented in a logical sequence. Students will understand the planning and deployment of equipment, materials, labor, and subcontractors using a variety of building material and system types. This course provides a necessary baseline of knowledge, vocabulary, and understanding of the role and activities of the designers, engineers, material suppliers, inspectors, and constructors in the commercial building process.

CECM 673. Project Planning and Control. 3 Hours.
This course provides a thorough understanding of the project scheduling process in construction planning and control. Students learn the relationship between the work breakdown structure, organization breakdown structure, and the activities used in developing project schedules. The Critical Path Method (CPM), Precedence Diagram Method (PDM), Program Evaluation and Review Technique (PERT), and Line of Balance (LOB) scheduling methods are discussed in detail to include hand calculations and powerful computer software products. The use of scheduling techniques for project control, resources constraint management, cash flow management, risk management, and project completion date management are investigated as is the importance of communications in the planning and monitoring/controlling processes. Students will experience hands on use with Primavera scheduling software.

CECM 674. Green Building Design/Construction. 3 Hours.
The course addresses the key concepts, viewpoints and fundamentals essential for understanding green building and construction. Materials are focused on how key stakeholders and their future collaborations can begin to incorporate sustainable construction practices for the betterment of the project (new construction and inventory rehabilitation). The course will include instruction suitable to prepare students for the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED©) Green Associates certification exam.

CECM 675. Advanced Construction and Engineering Economics. 3 Hours.
This course provides an extensive overview of financial and managerial accounting concepts for non-financial managers. Students will learn the basic elements of accounting (Generally Accepted Accounting Practices (GAAP)). They will understand how typical financial records and financial statements are established for companies. Once the basics are understood, students will study how financial data is used for internal cost controlling, planning, and budgeting. Fundamental financial calculations associated with the time value of money, debt instruments, taxes, inflation, and cash flow estimates are emphasized. Students will be expected to demonstrate proficiency in the use of Excel business functions in solving financial problems.

CECM 676. Construction Project Risk Management. 3 Hours.
This course addresses the methodologies employed in the engineering and construction industries to assist in rational decision-making in the face of uncertainty. The course reviews the fundamentals of common probabilistic theories and models, data sampling, hypothesis testing and the basics of Bayesian Decision Theory. In addition, basic financial analysis tools will be reviewed. Theoretical models will then be applied to specific examples encountered in engineering and construction decision making with emphasis on engineering economics applications.

CECM 688. Construction Management and Leadership Challenges in the Global Environment. 3 Hours.
This course is designed to prepare students to face the demanding management and leadership challenges facing construction and engineering industry leaders as competition becomes ever more globalized. The necessity to personally remain trained and relevant in the changing business environment is emphasized. Strategic planning, management and leadership in the built environment requires savvy leaders with exceptionally developed analytical and communications skills suitable for multi-disciplinary and multi-national ventures. Every individual and organization must continually innovate and reinvent to stay competitive. Students participate in a group project designed to reinforce the methodology associated with preparing and presenting a dynamic business plan. This course will provide the opportunity for students to discuss and research these concepts and to recognize the necessity to think independently, challenge conventional thinking, and visualize alternatives.

CECM 689. Building Information Modeling (BIM) Techniques. 3 Hours.
This course provides students with an overview of the evolution of BIM technology in the construction industry followed by hands-on training in the basic application of contemporary BIM software. Students will learn basic modeling skills and how to produce graphical presentations. Advanced applications of BIM technology will be discussed and demonstrated. Students will be provided with BIM software and will be required to complete a multi-step BIM model as a term project.

CESC-Sustainable Smart Cities Courses

CESC 600. Principles of Sustainable Development. 3 Hours.
The course will begin by discussing the concepts, viewpoints and fundamentals essential for understanding urban sustainable development agenda. This will be followed by the evaluation of international conferences and action items proposed by the scientific / professional community to advance sustainable smart cities development. You will review basic earth sciences to better evaluate the impact our anthropogenic activities have on the natural environment and therefore how to minimize adverse future outcomes. Throughout the course case studies of sustainable developments will be used to illustrate the value, challenges and limitations of this concept. In the end, you will possess the knowledge base needed to help advance sustainable smart cities development.

CESC 602. Introduction to Sustainable Smart Cities. 3 Hours.
This course introduces the issues surrounding sustainable development within cities and explores how the smart city concept can contribute to the urban sustainable development agenda. The course begins by considering the key characteristics of contemporary urbanization and the issues and challenges that these present for sustainability and urban environmental management. The meaning and nature of sustainability for cities will be discussed, followed by a consideration of the definitions of a smart city and a discussion of the key elements of a smart city including its contribution to both urban governance and the more effective and efficient management of natural resources. With reference to case studies the final part of the course will explore and evaluate the role that smart city processes and applications can play in enhancing the social, economic and environmental aspects of sustainable development within urban areas.

CESC 604. Low-Carbon and Renewable Energy Systems for Smart Cities. 3 Hours.
As the energy infrastructure is arguably the most important feature in any city energy efficiency and integration of renewable energy sources within urban areas are central to the smart city concept. This course will firstly explore why there is a need for the greater use of low carbon and renewable energy systems within cities, followed by an introduction to the range of low carbon and renewable energy technologies currently available. The course will then move on to introduce the concept of the smart grid and then explore the potential to integrate low carbon and renewable energy systems into smart grids in order to move towards cost-effective, efficient and more environmentally friendly energy provision within cities. Challenges and issues associated with the greater integration of low carbon and renewable energy systems into energy infrastructure within large urban areas will also be considered.

CESC 606. Managing Natural Resources and Sustainable Smart Cities. 3 Hours.
The course examines the challenges of resource use and management within the context of an urbanizing world, exploring how new concepts within the smart and sustainable city agenda may contribute to addressing these challenges. The course begins by considering contemporary patterns of resource use created by cities in the modern world at a variety of scales from the local to the global. New approaches in the form of ecosystem services and urban metabolism in relation to natural resource management are examined in terms of their contribution to developing a smart and sustainable city agenda. The course continues by exploring a selection of key natural resources challenges (e.g. water, energy, air quality and climate) and the development of new management approaches and strategies in these areas. The course concludes by examining the development of integrated environmental management systems and governance structures within which these new approaches can be implemented with reference to a series of case studies.

CESC 608. Green Infrastructure and Transportation. 3 Hours.
The course covers policy and technical issues related to sustainable transportation. The course begins by discussing the concepts, viewpoints and fundamentals essential for understanding sustainable transportation planning. Tools used to assess sustainability of transportation facilities and neighborhoods are introduced next. The course also presents design options in support of green infrastructure and transportation, including livable street design, and traffic calming applications. The course is expected to expand students' knowledge base on sustainable transportation issues and help them understand the concept of sustainable transportation toward the development of sustainable smart cities.

CESC 610. Health and Livability. 3 Hours.
This course will address the multidisciplinary aspects of urban environmental quality and its impact on human well-being. It will provide a critical appreciation of the factors which influence health, well-being and quality of life within contemporary urban environments, demonstrate the importance of genomics and health informatics in developing strategies for improving the health and well-being of urban citizens, explore the importance of urban design and the contribution of the development of food smart cities in improving both urban health and livability, and understand the increasingly important role of Information and Communications Technology (ICT) in facilitating delivery of effective and responsive urban health, well-being, and quality of life strategies.

CESC 612. Green Buildings. 3 Hours.
The course will begin by discussing the concepts, viewpoints and fundamentals essential for understanding green building and construction. Discussions will then be focused on how key stakeholders and their future collaborations can begin to incorporate sustainable construction practices for the betterment of the project (new construction and inventory rehabilitation). This will be followed by the evaluation of sustainable construction rating systems (LEED, BREEAM, etc.) and how they can be applied to occupied buildings throughout an urban environment. Modular case studies of sustainable construction projects (individual structures to entire community developments) will be used to illustrate the value, challenges and limitations of this concept. In the end, students will possess an expanded knowledge base needed to help advance sustainable smart cities development.

CESC 614. Smart Cities Technologies. 3 Hours.
This course gives students the opportunity to study emerging smart technologies that can be deployed and integrated together with the aim of improving overall building / city performance. The course provides an overview of technologies that can be used to: sense and measure physical parameters; acquire, process, and analyze various datasets; and make appropriate decisions / gives suitable instructions based on all available information. Specific technologies addressed include Data Acquisition, Telecommunications, Wireless Sensor Networks, and the Internet of Things. The course will also explore and evaluate how these emerging technologies can contribute to various smart cities / buildings priorities, namely Energy Management, Health, Safety, and Security.

CESC 616. Big Data and Smart Cities. 3 Hours.
The world is becoming increasingly digitally interconnected and this instrumentation, data collection, interconnection, storage, and analysis can provide the capacity to radically transform how cities monitor, manage and enhance their environmental quality and livability. This course will provide an introduction to what big data is and how it can contribute to the smarter, more sustainable management of cities. The course will begin by discussing the concepts of big data and the big data revolution, and an overview of the ways in which data can be captured, stored and analyzed. This will be followed by a consideration of how big data can be used by city managers to optimize: their use of physical and digital infrastructures; their sustainable use of natural resources; citizen service delivery; and citizen engagement, participation and urban governance. You will also be introduced to some of the challenges presented by big data, both the technological challenges and the ethical and social implications associated with collecting, storing and using big data. Throughout the course case studies of big data in action will be used to illustrate the value, challenges and limitations of big data in the smarter, more sustainable management of cities.

CESC 618. Research Methods and Project Planning. 3 Hours.
As a student of smart city processes and urban environmental management you need to understand the research process which enables you to take the knowledge and skills which you have learned and apply it to a specific urban sustainability / environmental management issue. This course is not intended to provide a training in research techniques, but rather to make you aware of a wide range of investigative and analytical methods and techniques using examples drawn from the areas of smart city approaches, urban sustainability and environmental management. Both quantitative and qualitative methodologies and primary and secondary data collection will be covered. You will be encouraged to reflect on the research process and its outcomes by critiquing research papers written from methodological standpoints. You will then apply this knowledge to create a viable research proposal for your own Sustainable Smart Cities Masters project. This proposal will require you to identify and justify for your chosen topic: (i) appropriate research questions, (ii) methodologies and data sampling / collection techniques, (iii) ethical and health and safety implications and, (iv) a timetable of action.

CESC 620. Sustainable Smart Cities Research Project. 0 Hours.
This course will develop skills in both research and technical writing in the area of applying and/or evaluating sustainable smart cities processes and policies to a specific urban environmental or sustainability issue. The research proposal produced as part of the Research Methods and Project Planning course will be implemented. This will involve further research into the relevant background and context of a chosen project topic, implementation and evaluation of appropriate methods for collecting and analyzing data, observations and information, the ability to present findings clearly and concisely, and appreciate their significance in relation to the smart city and sustainable urban management agendas. Research should be at the forefront of student's chosen sustainable smart cities research topic and be at a level similar to that required for acceptance and presentation at a national level conference or symposium on smart and sustainable cities. For students in relevant employment, projects may be carried out in your place of work subject to discussions between you, your employer/line manager, and your project supervisor.

CESE - Structural Engineering Courses

CESE 653. Wood and Masonry Design. 3 Hours.
Design of wood structures to meet the requirements of the National Design Specification including beams, columns, and shear walls. Design and detailing of masonry structures. Nomenclature, properties, and specifications for components. Design of assemblages and masonry elements in simple masonry structures.

CESE 656. Advanced Mechanics of Materials for Structural Engineering. 3 Hours.
This course will review the basic fundamentals of mechanics of materials and will extend the concepts to include 3-dimensional stress and strain, plastic behavior, energy methods, nonlinear behavior, fatigue and fracture, rectangular linear elastic plates, indeterminate structures and stability.

CESE 657. Advanced Design of Steel Structures. 3 Hours.
Design of major components in steel-framed buildings, including composite beams and slabs, beam-columns, moments connections, bracing members, bracing connections, and column base plates.

CESE 659. Advanced Reinforced Concrete. 3 Hours.
In this course students will study the behavior and design of continuous reinforced concrete structures submitted to gravity and lateral loads. The study will include biaxial loading of columns, continuous one-way beams and slabs, two-way floor systems, and torsion loading.

CESE 660. Prestressed Concrete Behavior and Design. 3 Hours.
The course will explore the characteristics and design of pre-stressed concrete structural components to include elastic and ultimate strength analyses for flexural, shear, torsion, deflection, strand bond, and pre-stress loss.

CESE 662. Advanced Structural Analysis. 3 Hours.
This course explores the structural analysis of indeterminate structures using classical and approximate methods and structural analysis software. Specific emphasis is placed on the determination of forces in typical multistory, rectilinear frames subject to gravity and lateral loads. In addition to first order analysis, the course included analysis for second order effects and plastic analysis.

CESE 664. Bridge Engineering. 3 Hours.
This course includes the study of bridge loads, including moving load analysis; methods for approximate structural analysis, preliminary bridge design methods, and the structural design of bridge decks and girders.

CESE 665. Structural Dynamics and Earthquake Engineering. 3 Hours.
This course includes the study of earthquake-induced vibrations of single and multi-degree-of-freedom systems, such as single and multistory frames. Emphasis will be placed on structural steel and reinforced concrete building frames. Response spectrum analysis will be investigated as well as building codes and static and dynamic lateral load force procedures.

CESE 676. Design of Structural Steel Connections. 3 Hours.
Design of bolted and welded steel connections, including shear, moment and brace connections using the AISC Specifications requirements and fundamental engineering principals. Design procedures will be discussed for various structural steel connections. The background and limitations of the design procedures will be reviewed and practical solutions will be provided.

CESE 690. Special Topics (Area). 1-3 Hour.
Special Topics (Area).

CESE 698. Non Thesis Research. 3 Hours.
No syllabus for non-thesis research hours.

EE-Electrical Computer Egr Courses

EE 512. Practical Computer Vision. 3 Hours.
This course covers the fundamentals and application of image analysis. Topics include: image pre-processing, detection, segmentation, classification and recognition, visual tracking, and deep learning.

EE 518. Wireless Communications. 3 Hours.
This course covers the principles and current applications of wireless technology. Topics include propagation models, modulation, multiple access, and channel and signal coding. Applications of wireless for cellular and Internet of Things (IoT) will also be covered.

EE 521. Communication Systems. 3 Hours.
This course covers the mathematics of modulation and demodulation of radio signals to transmit and receive information. It focuses on various forms of amplitude modulation (AM), phase and frequency modulation (FM). This course builds on the mathematics from signals and systems course to study how to represent and manipulate these signals in both time and frequency domain. It also studies the effects of sampling, and how these systems operate in the presence of noise.

EE 523. Digital Signal Processing. 3 Hours.
This course covers the theory and practice of using computers to process and analyze signals. The topics include: digital filter analysis and design; Fast Fourier Transform (FFT) algorithms; applications of digital signal processing in engineering problems such as data acquisition and control.

EE 526. Control Systems. 3 Hours.
This course covers modeling and control of mechanisms or circuits to satisfy stability and performance criteria. Topics include: theory of linear feedback control systems using complex frequency techniques, block diagram manipulation, performance measures, stability, analysis and design using root locus, and Z-transform methods.

EE 527. Industrial Control. 3 Hours.
This course covers power control devices and applications, relay logic and translation to other forms, programmable logic controllers (PLCs), proportional-integral-derivative (PID) and other methods for process control, modern laboratory instrumentation, and human-machine interface (HMI) software.

EE 531. Analog Integrated Electronics. 4 Hours.
This course covers advanced analysis and design using op-amps, differential amplifier, half-circuit analysis, error analysis and compensation. Applications include signal conditioning for instrumentation, instrumentation amplifiers, nonlinear and computational circuits, analog filter design, voltage regulator design, and oscillators, circuit configurations for A-to-D and D-to-A conversion methods. Laboratory exercises emphasize design techniques for projects in areas such as Internet-of-Things (IoT).

EE 532. Introduction to Computer Networking. 3 Hours.
This course covers the fundamentals of modern computer networks including current applications such as Internet of Things (IoT). Topics include: hardware and software level network protocols, network architecture and topology including WANs and LANs, client-server relationships, distributed computing, data transfer, security, virtualization of hardware, multi-tier network configuration examples, and certifications will be addressed.
Prerequisites: EE 134 [Min Grade: C] and EE 210 [Min Grade: C]

EE 533. Engineering Software Solutions. 3 Hours.
This course covers the fundamentals of software design, architecture, and implementation for future software engineers. Topics include: customer-focused requirements gathering, project planning, team tools, architectural patterns, environment and component selection, quality assurance, sustainability, and versioning. Various development methodologies are discussed with a project demonstrating at least one release cycle.

EE 534. Power Semiconductor Electronics. 3 Hours.
This course covers the fundamentals of power electronics such as principles of static power conversions, basic power converter architectures, power semiconductor switches, steady-state equivalent circuit modeling, DC transformer model, basic AC equivalent circuit modeling, linearization and perturbation. Pulse width modulation and controller design, circuit design considerations, and applications of power electronics. The course project emphasizes computer-aided analysis and design of power electronic circuits.

EE 537. Introduction to Embedded Systems. 3 Hours.
This course provides an applied introduction to the design of embedded systems, including hardware and software aspects. Topics include: various embedded hardware platforms, interfacing industrial bus systems, sensors, actuators, low-power wireless communication, and the application of the Internet of Things (IoT).

EE 538. Computer Architecture. 3 Hours.
Advanced microprocessor topics include a comparison of advanced contemporary microprocessors, cache design, pipelining, superscalar architecture, design of control units, microcoding, and parallel processors. Basic knowledge of microprocessors is recommended.

EE 544. Real-Time Process & Protocols. 3 Hours.
This course covers hands-on laboratory topics in real-time computer systems, such as algorithms, state-machine implementations, communication protocols, instrumentation, and hardware interfaces.

EE 547. Internet/Intranet Application Development. 3 Hours.
This course covers development of software models and applications using Internet/Intranet technologies. Topics include: web client-server relationships, multi-tier design models, scripting and validation, basic TCP/IP networking, separation of concerns, markup and data description languages. Projects will allow the opportunity for the use of a range of tools and development platforms.
Prerequisites: EE 233 [Min Grade: C]

EE 548. Software Engineering Projects. 3 Hours.
This course covers practical applications of software engineering including the development of applications for the Internet of Things (IoT). Topics include: requirements gathering, design matrices, environment selection, relevant architectural patterns, networking basics, databases, service endpoints, embedded systems selection and security. Projects with a software emphasis will be utilized to demonstrate the principles of IoT applications.
Prerequisites: EE 333 [Min Grade: C]

EE 552. Digital Systems Design. 3 Hours.
This course covers the design of customized complex digital systems using Field Programmable Gate Array (FPGA) based platforms, using modern design tools for simulation, synthesis, and implementation. Topics include hardware design and development languages such as Verilog or VHDL.

EE 558. Medical Instrumentation. 3 Hours.
This course covers the fundamental operating principles, applications, safety, and design of electronic instrumentation used in the measurement of physiological parameters.

EE 561. Machinery II. 3 Hours.
Physical principles of DC machines. Mathematical analysis of generator designs using equivalent circuits and magnetization curves. Calculation of motor speed, torque, power, efficiency, and starting requirements. Solid-state speed control systems.

EE 563. Medical Image Analysis. 3 Hours.
A lab-based introduction to processing, analysis, and display techniques for medical imaging.

EE 567. Brain Machine Interface. 3 Hours.
This course explores the brain-machine interfaces, particularly the technologies that directly stimulate and/or record neural activity. This course is divided into three major components: 1) neuroscience and electrode interfaces, 2) brain recording and stimulating front-end circuits, and 3) circuit modeling, simulation, and optimization.

EE 571. Power Systems I. 3 Hours.
Components of power systems. Performance of modern interconnected power system under normal and abnormal conditions. Calculation of inductive and capacitive reactances of three-phase transmission lines in a steady state.

EE 572. Power Systems II. 3 Hours.
Modeling of generators, transformers, and transmission lines for system studies. Introduction to symmetrical components. Calculation of short-circuit currents due to balanced and unbalanced faults. Determination of interrupting ratings of circuit breakers. Transient stability of power systems. Derivation of swing equation and solution by numerical method. Equal area criterion. A power system design project is required.

EE 573. Protective Relaying of Power Systems. 3 Hours.
Operating principles of protective relays. Protection of transmission lines, generators, motors, transformers, and buses.

EE 585. Engineering Operations. 3 Hours.
This course covers the principles and standard of engineering design from ideation to final design. Topics include: product development process, problem definition and need identification, embodiment and detail design, design for specific criterion, modeling and cost evaluation. Emphasis is placed on ethics and civil responsibilities in design including environmental, social issues, liability, sustainability and reliability through the lens of engineering design.

EE 590. Special Topics in Electrical and Computer Engineering. 1-3 Hour.
Special Topic in Electrical or Computer Engineering.

EE 591. Individual Study in Electrical and Computer Engineering. 1-6 Hour.
Individual Study in Electrical Engineering.

EE 601. Electrical and Computer Engineering Seminar. 1-3 Hour.
This course consists of research presentations delivered by faculty, research assistants, and invited guests in various state-of-the-art and popular topics related to Electrical and Computer Engineering.

EE 610. Technical Communication for Engineers. 3 Hours.
A workshop-oriented course providing students with the opportunity to produce technical memoranda, a proposal, and a conference and/or refereed journal paper and to make oral presentations related to these work products utilizing appropriate software presentation aids.

EE 616. Design of CMOS Analog Integrated Circuits. 3 Hours.
This course will cover basic building blocks of CMOS analog VLSI design, MOSFET theory, short channel device and nonlinear effects, current mirrors, current-reference generator, operational transconductance amplifier, switched capacitor architecture, analog-to-digital converter and digital-to-analog converter. Students will be required to develop a computer aided design, simulation, and chip layout of an analog integrated circuit design project. Fundamental knowledge of electronics is required.

EE 621. Random Variables and Processes. 3 Hours.
Theory underlying analysis and design of communication, stochastic control, data gathering, and data analysis systems.
Prerequisites: EE 421 [Min Grade: C]

EE 622. Advanced Communication Theory. 3 Hours.
Analysis of the performance of analog modulation techniques in presence of noise.
Prerequisites: EE 621 [Min Grade: C]

EE 623. Computer Vision. 3 Hours.
Advanced topics in computer vision: image segmentation, registration, and visual tracking; applications of deep learning to image analysis.

EE 624. Digital Communications. 3 Hours.
Design and analysis of digital communications modulation techniques and systems and their performance in the presence of noise.
Prerequisites: EE 622 [Min Grade: C]

EE 625. Information Theory and Coding. 3 Hours.
Channel models and block codes, block code ensemble performance analysis, convolutional codes and ensemble performance, sequential decoding of convolutional codes.
Prerequisites: EE 621 [Min Grade: C]

EE 626. Digital Image Processing. 3 Hours.
The course covers topics in image transformations, enhancement, restoration, compression, and representation. Introduction to image segmentation.

EE 627. Wireless Communications. 3 Hours.
Wireless communication system topics such as propagation, modulation techniques, multiple access techniques, channel coding, speech and video coding, and wireless computer networks.

EE 630. Short-Range Wireless Systems. 3 Hours.
This course covers the short-range wireless power transmission (WPT), wireless data communication, and wireless sensor technologies. It emphasizes fundamental understanding of the principles and design procedure of short-range wireless power/data transfer systems as well as the various parameters involved in the optimization of wireless power/data transmission systems.

EE 632. Introduction to Computer Networking. 3 Hours.
Computer networking fundamentals. Layered network model and correspondence to real systems. Discussion of Ethernet, Token Ring, TCP/IP, LAN, and other protocols. Exploration of the Internet and similar systems. Network application models. Simulation of networks.

EE 633. Experiments in Computer Networking. 3 Hours.
Detailed exploration of particular issues in network protocols and network application models. Development of a series of programs to explore the details of network protocols and network application models.

EE 634. Introduction to Neural Networks. 3 Hours.
Artificial neural network topologies and training algorithms with an emphasis on back propagation. Deep learning with Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), applications and limitations of neural networks, and designing networks specific uses.

EE 636. Advanced Digital Design. 3 Hours.
This course covers the design of Complex Programmable Logic Devices (CPLDs) and Field Programmable Gate Arrays (FPGAs). Topics include the design, simulation, and testing of digital systems using a hardware description language and FPGA/CPLD development boards with programmable logic devices.

EE 637. Design of Modern Computer with Digital Integrated Circuits. 3 Hours.
This course covers the design of advanced digital circuits with VLSI components. Topics include synthesis, design, simulation, and testing of advanced digital circuits using a hardware description language and FPGA/CPLD development boards with programmable logic devices. Design examples: switching networks, graphics engine, DSP, Internet of Things (IoT) controller, and programmable logic controller (PLC).

EE 638. Neural Time Series Data Analysis. 3 Hours.
This course covers the theory and practice of analyzing brain signals. Students will learn about conceptual, mathematical and implementational (via MATLAB programming) aspects of time-, frequency- and synchronization-based analyses of magnetoencephalography (MEG), electroencephalography (EEG), and local field potential (LFP) recordings from humans and nonhuman animals.

EE 639. Embedded Systems. 3 Hours.
This course covers both hardware and software trends in advanced embedded system design, including artificial intelligence (AI) and optimized hardware platforms for machine learning (ML). The fundamental algorithms of AI and ML are discussed. Various process acceleration techniques for improving the computational efficiency of ML kernels are implemented on FPGA/CPLD development boards and FPGA/CPLD chips.

EE 640. Object-Oriented Design. 3 Hours.
This course provides in-depth coverage of object-oriented design principles and methodologies. Topics include object-oriented design frameworks, use-cases, class-responsibility-collaboration (CRC), design patterns, and software reuse. Knowledge of an object-oriented language is recommended.

EE 641. Modern Control Theory. 3 Hours.
This course covers state variable models for continuous-time and discrete time systems, state feedback and pole placement, and state estimation. Knowledge of basic control systems is recommended.

EE 642. Intelligent Systems. 3 Hours.
This course covers the organization and characteristics of intelligent systems, optimization, evolutionary algorithms, neural networks, fuzzy logic algorithms, and intelligent control.

EE 643. Numerical Methods in Engineering. 3 Hours.
This course covers the theory and practice of numerical methods for a broad spectrum of engineering applications and data analyses. Topics include numerical calculus, linear algebra, and optimization. Students will be exposed to modern topics such as convolutional neural networks, compressed sensing, eigenfaces, stability, principal component analysis, k-means clustering, image segmentation, detection of a signal in the noise, and function fitting. This course provides hands-on practical experience with programming numerical analysis algorithms.

EE 650. Software Engineering. 3 Hours.
This course covers the engineering approach to developing software solutions to real-world problems. Topics include an overview of Software Engineering, requirements elicitation, design, implementation, and an overview of software development methods.

EE 651. Software Engineering Large Systems - I. 3 Hours.
This course covers advanced integrated software systems development methods. Adaptive and prescriptive software systems development methods are covered with an in-depth exploration through team projects using current software development methods.

EE 654. Mobile Computing. 3 Hours.
This course covers the fundamentals and advanced concepts in mobile computing. Develop user interface, application logic, and back-end services, using advanced integrated development environments. Individual and team projects. Programming required.

EE 655. Cloud Computing. 3 Hours.
This course covers fundamental and advanced concepts in cloud computing, including evaluation of current market offerings. Students will also design and implement systems integrating multiple cloud computing services.

EE 656. Introduction to Big Data Analytics. 3 Hours.
This course covers an introduction to the field of big data analytics, including technologies, challenges, architecture, and hypothesis testing.

EE 658. Machine Learning in Engineering. 3 Hours.
This course covers techniques for developing solutions to complex problems in different engineering domains without having to explicitly program the computers. Topics include supervised and unsupervised learning, classification and regression, support vector machines (SVM), boosting, and artificial neural networks.

EE 660. Medical Signal Processing. 3 Hours.
This course covers the theory and practice of processing and analyzing single-channel and multiple-channel medical signals. The topics include linear and nonlinear filtering, cross-estimation, autoregressive and spectral modeling, entropy, principal component analysis (PCA), classification, and clustering methods.

EE 667. Advanced Brain Machine Interface. 3 Hours.
This course consists of four major parts: 1) neuroscience and interfaces, 2) brain imaging technologies, 3) front-end circuit design, 4) power/data links and graphical user interface, and 5) circuit, wireless link, and safety simulating software-learning parts.

EE 682. Electromagnetic Field Theory I. 3 Hours.
This course covers the modeling of materials and environments through the simulation of electromagnetic fields. It includes a wide variety of applications, including biomedical and the Internet of Things (IoT). Topics include boundary-value problems and scattering.

EE 690. Special Topics in (Area). 1-6 Hour.
Special topics selected by faculty for master's students.

EE 691. Individual Study in (Area). 1-6 Hour.
Individual study selected by faculty for master's students.

EE 697. Graduate Project. 3 Hours.
Graduate project for Plan II Masters students.

EE 698. Non-Thesis Research. 1-12 Hour.
Individual research in selected area by faculty for master's students.

EE 699. Thesis Research. 1-12 Hour.
Thesis research.
Prerequisites: GAC M

EE 701. Electrical and Computer Engineering Seminar. 1-3 Hour.
This course consists of research presentations delivered by faculty, research assistants, and invited guests in various state-of-the-art and popular topics related to Electrical and Computer Engineering.

EE 710. Technical Communication for Engineers. 3 Hours.
A workshop-oriented course providing students with the opportunity to produce technical memoranda, a proposal, and a conference and/or refereed journal paper and to make oral presentations related to these work products utilizing appropriate software presentation aids.

EE 716. Design of CMOS Analog Integrated Circuits. 3 Hours.
This course will cover basic building blocks of CMOS analog VLSI design, MOSFET theory, short channel device and nonlinear effects, current mirrors, current-reference generator, operational trans conductance amplifier, switched capacitor architecture, analog-to-digital converter and digital-to-analog converter. Students will be required to develop a computer aided design, simulation and chip layout of an analog integrated circuit design project. Fundamental knowledge in electronics is required.

EE 721. Random Variables and Processes. 3 Hours.
Theory underlying analysis and design of communication, stochastic control, data gathering, and data analysis systems.

EE 722. Advanced Communication Theory. 3 Hours.
Analysis of the performance of analog modulation techniques in presence of noise.

EE 723. Computer Vision. 3 Hours.
Advanced topics in computer vision: Image segmentation, registration, and visual tracking; applications of deep learning to image analysis.

EE 724. Digital Communications. 3 Hours.
Design and analysis of digital communications modulation techniques and systems and their performance in the presence of noise.
Prerequisites: EE 622 [Min Grade: C]

EE 725. Information Theory and Coding. 3 Hours.
Channel models and block codes, block code ensemble performance analysis, convolutional codes and ensemble performance, sequential decoding of convolutional codes.
Prerequisites: EE 621 [Min Grade: C]

EE 726. Digital Image Processing. 3 Hours.
This course covers topics in image transformations, enhancement, restoration, compression, and representation. Introduction to image segmentation.

EE 727. Wireless Communications. 3 Hours.
Wireless communication system topics such as propagation, modulation techniques, multiple access techniques, channel coding, speech and video coding, and wireless computer networks.

EE 730. Short-Range Wireless Systems. 3 Hours.
This course covers the short-range wireless power transmission (WPT), wireless data communication, and wireless sensor technologies. It emphasizes fundamental understanding of the principles and design procedure of short-range wireless power/data transfer systems as well as the various parameters involved in the optimization of wireless power/data transmission systems.

EE 732. Introduction to Computer Networking. 3 Hours.
Computer networking fundamentals. Layered network model and correspondence to real systems. Discussion of Ethernet, Token Ring, TCP/IP, LAN, and other protocols. Exploration of the Internet and similar systems. Network application models. Simulation of networks.

EE 733. Experiments in Computer Networking. 3 Hours.
Detailed exploration of particular issues in network protocols and network application models. Development of series of programs to explore the details of network protocols and network application models.

EE 734. Introduction to Neural Networks. 3 Hours.
Artificial neural network topologies and training algorithms with an emphasis on back propagation. Deep learning with Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), applications and limitations of neural networks, and designing networks for specific uses.

EE 736. Advanced Digital Design. 3 Hours.
This course covers the design of Complex Programmable Logic Devices (CPLDs) and Field Programmable Gate Arrays (FPGAs). Topics include the design, simulation, and testing of digital systems using a hardware description language and FPGA/CPLD development boards with programmable logic devices.

EE 737. Design of Modern Computers with Digital Integrated Circuits. 3 Hours.
This course covers the design of advanced digital circuits with VLSI components. Topics include synthesis, design, simulation, and testing of advanced digital circuits using a hardware description language and FPGA/CPLD development boards with programmable logic devices. Design examples: switching networks, graphics engine, DSP, Internet of Things (IoT) controller, and programmable logic controller (PLC).

EE 738. Neural Time Series Data Analysis. 3 Hours.
This course covers theory and practice of analyzing brain signals. Students will learn about conceptual, mathematical and implementational (via MATLAB programming) aspects of time-, frequency- and synchronization-based analyses of magnetoencephalography (MEG), electroencephalography (EEG), and local field potential (LFP) recordings from humans and nonhuman animals.

EE 739. Embedded Systems. 3 Hours.
This course covers both hardware and software trends in advanced embedded system design, including artificial intelligence (AI) and optimized hardware platforms for machine learning (ML). The fundamental algorithms of AI and ML are discussed. Various process acceleration techniques for improving the computational efficiency of ML kernels are implemented on FPGA/CPLD development boards and FPGA/CPLD chips.

EE 740. Object-Oriented Design. 3 Hours.
This course provides in-depth coverage of object-oriented design principles and methodologies. Topics include: object-oriented design frameworks, use-cases, class-responsibility-collaboration (CRC), design patterns, and software reuse. Knowledge of an object-oriented language is recommended.

EE 741. Modern Control Theory. 3 Hours.
This course covers state variable models for continuous-time and discrete time systems, state feedback and pole placement, and state estimation. Knowledge of basic control systems is recommended.

EE 742. Intelligent Systems. 3 Hours.
This course covers the organization and characteristics of intelligent systems, optimization, evolutionary algorithms, neural networks, fuzzy logic algorithms, and intelligent control.

EE 743. Numerical Methods in Engineering. 3 Hours.
This course covers the theory and practice of numerical methods for a broad spectrum of engineering applications and data analyses. Topics include numerical calculus, linear algebra, and optimization. Students will be exposed to modern topics such as convolutional neural networks, compressed sensing, eigenfaces, stability, principal component analysis, k-means clustering, image segmentation with active contours, detection of a signal in the noise, and function fitting. This course provides hands-on practical experience with programming numerical analysis algorithms.

EE 750. Software Engineering. 3 Hours.
This course covers the engineering approach to developing software solutions to real-world problems. Topics include an overview of Software Engineering, requirements elicitation, design, implementation, and an overview of software development methods.

EE 751. Software Engineering Large Systems - I. 3 Hours.
This course covers advanced integrated software systems development methods. Adaptive and prescriptive software systems development methods are covered with an in-depth exploration through team projects using current software development methods.

EE 752. Software Engineering Large Systems - II. 3 Hours.
This course covers software development in enterprise environments using Dev-Ops practices such as continuous integration and delivery.

EE 754. Mobile Computing. 3 Hours.
This course covers the fundamentals and advanced concepts in mobile computing. Develop user interface, application logic, and backend services, using advanced integrated development environments. Individual and team projects. Programming required.

EE 755. Cloud Computing. 3 Hours.
This course covers fundamental and advanced concepts in cloud computing, including evaluation of current market offerings. Students will also design and implement systems integrating multiple cloud computing services.

EE 756. Introduction to Big Data Analytics. 3 Hours.
This course covers an introduction to the field of big data analytics, including technologies, challenges, architecture, and hypothesis testing.

EE 758. Machine Learning in Engineering. 3 Hours.
This course covers techniques for developing solutions to complex problems in different engineering domains without having to explicitly program the computers. Topics include supervised and unsupervised learning, classification and regression, support vector machines(SVM), boosting, and artificial neural networks.

EE 760. Medical Signal Processing. 3 Hours.
This course covers the theory and practice of processing and analyzing single-channel and multiple-channel medical signals. The topics include linear and nonlinear filtering, cross-estimation, autoregressive and spectral modeling, entropy, principal component analysis (PCA), classification, and clustering methods.

EE 767. Advanced Brain Machine Interface. 3 Hours.
This course consists of four major parts: 1) neuroscience interfaces, 2) brain imaging technologies, 3) front-end circuit design, 4) power/data links and graphical user interface, and 5) circuit, wireless link, and safety simulating software-learning parts.

EE 781. Electromagnetic Field Theory I. 3 Hours.
This course covers the modeling of materials and environments through the simulation of electromagnetic fields. It includes a wide variety of applications, including biomedical and the Internet of Things (IoT). Topics include boundary-value problems and scattering.

EE 790. Special Topics in (Area). 1-6 Hour.
Special topics selected by faculty for PhD students.

EE 791. Individual Study in (Area). 1-6 Hour.
Individual study in an area selected by faculty for PhD students.

EE 798. Non-Dissertation Research. 1-12 Hour.
Individual research in selected problem by faculty for PhD students.

EE 799. Dissertation Research. 1-12 Hour.
PhD dissertation research.
Prerequisites: GAC Z

EGR-Engineering Courses

EGR 500. Special Topics in (Study Away). 0-9 Hours.
Independent studies in various subject and/or service areas outside the state of Alabama or the continental United States.

EGR 510. ESL in Education. 1-6 Hour.
Course provides students an opportunity to help students in K-12 to analyze and solve problems using engineering concepts and design process to engage and excite them about engineering, science, and technology.

EGR 520. Engineers in Service and Learning in EiSAL. 0-6 Hours.
This course will allow engineering students the opportunity to communicate and live in other cultural environments allowing them to share interdisciplinary engineering design and analysis in a real-world setting. It will also allow them the opportunity to work in multi-cultural groups to solve a common problem.

EGR 540. Social Responsibility. 1 Hour.
This course provides students with an understanding of key social and economic concepts of global health that, together with an understanding of interprofessional collaboration and community partnerships, will enable them to participate in developing and implementing sustainable global health projects in collaboration with local and international community partners. The course is open to undergraduate and graduate students who are enrolled in two co-requisite courses that are requirements for students participating in the interprofessional global health service learning program at the University of Alabama at Birmingham.

EGR 541. Interprofessional Collaboration (IPC) and Community Partnerships in Global Health. 1 Hour.
This course provides students with an understanding of principles of interprofessional collaboration and community partnerships that, together with key social and economic concepts of global health, enables them to participate in developing and implementing sustainable global health projects in collaboration with local and international community partners.

EGR 542. EGR Service Learning:Interprofessional Global Health Service Learning I: Project Planning. 1 Hour.
This course provides students with an opportunity to apply principles of interprofessional collaboration, community partnerships, and global health in the development of a plan to address a global health problem in collaboration with a community partner. The course is open to undergraduate and graduate students who are enrolled in two co-requisite courses that are requirements for students participating in the global health service learning program at the University of Alabama at Birmingham.

EGR 550. Engineering Service Learning: Teaching Experiences. 1 Hour.
This course provides engineering students the opportunity to assist engineering faculty and students in a tutorial environment by serving as teaching assistants in engineering service courses.

EGR 590. Special Topics in Engineering. 1-3 Hour.
Special Topics in Engineering.

EGR 591. Individual Study in Engineering. 1-6 Hour.
Individual Study in Engineering.

EGR 602. Methods for Engineering Practice I. 3 Hours.
First of two course sequence oriented toward introducing the student to modern methods in engineering practice including design methodologies to project management and risk analysis; mathematical and statistical methods; data analysis; reliability; fault detection and analysis; and safety analysis methods.

EGR 603. Methods for Engineering Practice II. 3 Hours.
Second of a practical two course sequence that are oriented toward introducing the student to modern methods in engineering practice including design methodologies to project management and risk analysis; mathematical and statistical methods; data analysis; reliability; fault detection and analysis; and safety analysis methods.

EGR 610. Introduction to System Safety - Prevention through Design. 3 Hours.
Best practice in any business sector requires the pursuit of a triple bottom line – protecting people, planet, and profit. This course provides an overview of system safety in general and Prevention through Design in particular and explores their efficacy in helping companies achieve a bottom line that is socially, environmentally, and financially rewarding. Topics of inquiry include the processes of hazard analysis and risk assessment, the concept of "acceptable" risk, the safety decision hierarchy of controls, safety standards (the mandatory minimum vs. the voluntary best practice), safety as a cost control strategy, and the critical elements of a comprehensive, advanced safety program. Course content is presented within the framework of real-world case studies from a variety of industry sectors, including, but not limited to, manufacturing, utilities, and health care and includes several guest lectures by leaders in the profession. Students apply course content to their own business environment. Live participation in a weekly 1.5 hour online forum is required. The EGR 610 forum is typically held on Sunday from 1:30-3:00 CDT. EGR 610 must be taken during the first semester.

EGR 614. Engineering Ethics & Acceptable Risk. 3 Hours.
This course explores the economic, social, and political consequences of safety risk and considers provocative real world dilemmas: What is acceptable risk? Are the fundamental canons of engineering ethics contrary to the concept of acceptable risk? What is the worth of human life? Students will conduct critical reviews of corporate safety and ethics policies from market leaders in all major industries as well as their own company. Real-world case studies provide the framework for exercises in resolving conflicts of interest and avoiding the dilemma of “whistle blowing.” Live participation in a weekly 1.5 hour online forum is required. The EGR 614 forum is typically held on Sunday from 3:00-4:30 CDT.
Prerequisites: EGR 610 [Min Grade: C](Can be taken Concurrently)

EGR 642. Technical Entrepreneurship. 3 Hours.

EGR 690. Special Topics. 1-4 Hour.

EGR 692. Engineering Graduate Project. 3 Hours.
Students will conduct research and complete project for Plan II MS degree.

EGR 695. Innovation-Commercialization Project. 3 Hours.
Through hands on activities, as well as mentorship by professional engineers and local industrial designers, the students will develop products ready for mass production.

EGR 696. Internship in Design and Commercialization. 3 Hours.
An internship is designed to provide real world experiences in a profession of interest. It enables correlation of classroom learning with application in industry; broadens understanding of the types of employment available in the field; helps students discover their individual interests; builds resume credentials for the students; and develops relationships between UAB and industry.

EGR 697. Engineering Grad Internship. 0-6 Hours.
Student works in a professional environment reflective of research interests pursuant to graduate degree.

EGR 698. Non-Thesis Research. 1-12 Hour.
Research allows the student to explore a topic of interest under the close supervision of a faculty member. The course may include directed readings, applied work, in addition to carrying out individual research in selected area.

EGR 699. Thesis Research. 1-12 Hour.
Research allows the student to explore a topic of interest under the close supervision of a faculty member. The course may include directed readings, applied work, in addition to carrying out individual research in selected area.

EGR 710. Intro to Interdisciplinary EGR. 3 Hours.
Introduces current trends and cutting-edge research in areas related to engineering that require interdisciplinary approaches.

EGR 711. Methodology for IEGR Research. 3 Hours.
Presents a detailed perspective on methods of approach for interdisciplinary problems, including experimental design, laboratory experimentation, physical modeling, simulation, and analysis.

EGR 790. Special Topics. 1-4 Hour.

EGR 791. Independent Study. 1-6 Hour.
Independent Study in Engineering.

EGR 792. Interdisciplinary EGR Seminar. 1 Hour.
Discussions and presentations of research involving engineering in a number of disciplines. Required for graduate students in the interdisciplinary engineering Ph.D. program.

EGR 796. Journal Club in Interdisciplinary Engineering. 1 Hour.
Journal club to discuss current research and investigations in areas of interdisciplinary engineering.

EGR 797. Interdisciplinary Engineering Internship. 1-6 Hour.
Student works in a professional environment reflective of research interests pursuant to doctoral degree.

EGR 798. Non-Dissertation Research. 0-12 Hours.

EGR 799. Dissertation Research. 1-12 Hour.
Prerequisites: GAC Z

IEM-Information Egr Mgmnt Courses

IEM 601. Introduction to IEM. 1 Hour.
This course is an introduction to Information Engineering and Management with a focus on readiness for graduate study. Program requirements and expectations will be presented. Software and collaboration tools will be introduced. Library access and resources will be reviewed and teams will perform learning exercises to demonstrate proficiency with the available tools.

IEM 602. Leading Collaborative Teams. 1 Hour.
This course will focus on building, leading, and evaluating collaborative teams. Topics will include managing geographically-dispersed teams, team communication, accountability, running effective meetings, facilitation skills, building consensus, and handling common problems.
Prerequisites: IEM 601 [Min Grade: C]

IEM 603. Communication for Technology Executives. 1 Hour.
This course will address communication issues unique to organizational executives. Topics will include functioning as the public face of the organization, working with the media, when to seek professional advice, and effective crisis management.
Prerequisites: IEM 602 [Min Grade: C]

IEM 610. Communication for Technology Professionals. 3 Hours.
This course focuses on recognizing, developing, and putting into practice effective communication skills. Lectures provide insights into presentation structure, style, and content. Self-evaluation exercises combined with personal coaching will help clients improve their professional speaking and presentation skills.

IEM 611. Leading Technical Organizations. 3 Hours.
This course will use case studies, assigned readings, guest lecturers, research projects, and discussion of current issues in technology to develop executive-level behaviors and thought-processes as preparation for starting or leading a technology organization.

IEM 612. Project Leadership. 3 Hours.
This course teaches the fundamental concepts of leading projects. The course will consider all aspects of project leadership including the use of standard methodologies. Best practices will be reviewed along with practical insights based on real-world project leadership experience.

IEM 620. Technical Entrepreneurship. 3 Hours.
This course is an introduction to entrepreneurship that begins with the development of personal insights and work habits that are fundamental to success within any organization.

IEM 625. Technology and Innovation. 3 Hours.
This course examines technological innovation as an element of organizational strategy. Topics include the nature and management of innovation, aligning technical teams with overall organizational strategy, and the role of innovation in launching and sustaining technology ventures.

IEM 630. Systems Engineering. 3 Hours.
This course focuses on the systems engineering lifecycle and its application to the design of complex systems. Topics include systems thinking, managing complexity, problem definition, solution design, solution implementation, quality assurance, and measuring effectiveness.

IEM 631. Operational Decision-Making. 3 Hours.
This course focuses on the critical role of information and analytical methods in optimizing operational decisions. A core set of analytical tools will be presented and discussed. Topics will include decision analysis, optimization, modeling, simulation, and data analysis.

IEM 645. Financial Concepts for Entrepreneurs. 3 Hours.
This course introduces financial concepts including the interpretation of financial statements, managing cash flow, time value of money, capital budgeting, and investment analysis.

IEM 646. Strategic Planning. 3 Hours.
This course will examine the nature of strategic thinking and the challenges of achieving strategic alignment. Topics will include the strategic planning process and methods for assessing strategic success.

IEM 690. Special Topics in Area. 1-3 Hour.
Special Topics in (Area).

IEM 695. IEM Design Project. 3 Hours.
This course is focused upon a final design project that incorporates the technical and entrepreneurial coursework taken previously. Projects will be assessed based on their technical design and financial justification.

IEM 696. IEM Internship. 1-3 Hour.
This course is available for students needing to register for an internship course while enrolled in the IEM program.

ME-Mechanical Engineering Courses

ME 511. Intermediate Fluid Mechanics. 3 Hours.
Applications of fluid dynamic principles to engineering flow problems such as turbo-machinery flow and one-dimensional compressible flow. Vorticity, potential flow, viscous flow, Navier-Stokes solutions, and boundary layers. Introduction to Fluid Mechanics or equivalent is a recommended prerequisite for this course.

ME 521. Introduction to Computational Fluid Dynamics Basics. 3 Hours.
Governing equations for fluid flows, classifications of flow regimes, and approaches to analyze fluid flow problems. Introduction to Computational Fluid Dynamics (CFD), mesh generation, boundary conditions, numerical solution of equations governing fluid flows, and visualization. Hands-on exercises using a commercial CFD solver.

ME 530. Vehicular Dynamics. 3 Hours.
Introduction to the fundamentals of mechanics and analytical methods for modeling vehicle dynamics and performance. Topics include tire-road interaction modeling, vehicle longitudinal dynamics and traction performance, lateral dynamics, handling, stability of motion and rollover, as well as, contribution of the drivetrain system, steering system and suspension configurations to the dynamics of a vehicle. Software applications, projects, and exposure to hardware and systems are used to reinforce concepts. Dynamics or equivalent is a recommended prerequisite for this course.

ME 531. Introduction to Vehicle Drive Systems Engineering. 3 Hours.
Engineering fundamentals of mechanical and mechatronic, hybrid-electric, and electric drive systems. Applications to passenger cars and commercial vehicles. Drive system and component design, including main clutches and torque converters, transmissions, transfer cases, and drive axles. Introduction to plug-in hybrid-electric vehicles. Students registering for this course should have successfully completed (grade C or better) ME 215 Dynamics and ME 370 Kinematics and Dynamics of Machinery or equivalents.
Prerequisites: ME 215 [Min Grade: C] and ME 370 [Min Grade: C](Can be taken Concurrently)

ME 532. Introduction to Electric Vehicles. 3 Hours.
Introduction to fully electric and hybrid vehicle engineering. Mechatronic system and component design. Batteries and energy storage devices. Plug-in hybrid electric vehicles.

ME 545. Combustion. 3 Hours.
Evaluation of the impact of fuel characteristics and operating conditions on the performance of coal-fired electric utility steam-raising plant and the prospects for continued reliance on coal as fuel for electric power generation. The phenomena emphasized are the behavior of turbulent jets; ignition, devolatilization and combustion of coal particles; radiative heat transfer and the effect of ash deposits on heat transfer; formation of air pollutants and their removal from combustion products; integrated gasification combined cycle; and capture and sequestration of carbon dioxide. Thermodynamics II, Introduction to Fluid Mechanics, and Introduction to Heat Transfer or equivalents are recommended prerequisites for this course.

ME 547. Internal Combustion Engines. 3 Hours.
Fundamentals of reciprocating internal combustion engines: engine types, engine components, engine design and operating parameters, thermochemistry of fuel-air mixtures, properties of working fluids, ideal models of engine cycles, engine operating characteristics, gas-exchange processes, fuel metering, charge motion within the cylinder, combustion in spark-ignition and compression ignition engines.

ME 549. Power Generation. 3 Hours.
Application of thermodynamics, fluid mechanics, and heat transfer to conversion of useful energy. Includes terrestrial and thermodynamic limitations, fossil fuel power plants, renewable energy sources, and direct energy direct energy conversion. Thermodynamics II or equivalent is a recommended prerequisite for this course.

ME 554. Heating, Ventilating, & AC. 3 Hours.
Fundamentals and practice associated with heating, ventilating, and air conditioning; study of heat and moisture flow in structures, energy consumption, and design of practical systems. Introduction to Heat Transfer or equivalent is a recommended prerequisite for this course.

ME 555. Thermal-Fluid Systems Design. 3 Hours.
Comprehensive design problems requiring engineering decisions and code/Standard compliance. Emphasis on energy system components: piping networks, pumps, heat exchangers. Includes fluid transients and system modeling. Introduction to Heat Transfer is a recommended prerequisite for this course.

ME 556. Building Energy Modeling and Analysis. 3 Hours.
Computer modeling of energy use and thermal comfort in buildings using several software tools. Interpretation and analysis of the results. Implementing energy efficiency measures in the model and studying the effects on energy use. Students registering for this course should have successfully completed (grade of C or better) ME 242 Thermodynamics II and ME 322 Introduction to Heat Transfer or equivalents.

ME 564. Introduction to Finite Element Method. 3 Hours.
Concepts and applications of finite element method. Development and applications of basic elements used in engineering mechanics. Use of finite element analysis software. Application of finite element concept to several areas of mechanics. Mechanics of Solids or equivalent is a recommended prerequisite for this course.

ME 575. Mechanical Vibrations. 3 Hours.
Development of equations of motion for free and forced single-degree-of-freedom (SDOF) systems. Multi-degree-of-freedom systems. Transient response, support motion and vibration isolation for SDOFs. Vibration absorbers, generalized mass and stiffness, orthogonality of normal modes, and root solving and Gauss elimination procedures. Chelosky decomposition and Jacobi diagonalization methods.

ME 577. Systems Engineering. 3 Hours.
Exposure to the field of systems engineering, mission design, requirements development, trade studies, project life cycle, system hierarchy, risk analysis, cost analysis, team organization, design fundamentals, work ethics, compare and evaluate engineering alternatives, systems thinking.

ME 578. Automated Manufacturing. 3 Hours.
Introduction to automated manufacturing technology. Components of automated systems (controllers, sensors and actuators) and automated manufacturing sub-systems (3D printer, CNC, robot and computer vision) will be studied in a lecture\lab environment with hands on activities. A basic understanding of engineering graphics and computer methods at the undergraduate level is required for this course.

ME 580. Instrumentation and Measurements. 3 Hours.
Thorough exploration of fundamental measurement concepts and techniques for data acquisition and validation. Explanation of important selection criteria for the identification and configuration of commercially available data acquisition devices. Students will get hands on experience following best practices for data acquisition (high speed vs low speed) relevant to their field of study or career. Many types of sensors, their underlying technology, and measurement techniques will be discussed (i.e. accelerometers, load cells, Digital Image Correlation, etc.) to demonstrate best practices for sensor selection for a wide range of specialized applications.

ME 590. Special Topics in Mechanical Engineering. 1-3 Hour.
Special Topics in Mechanical Engineering.

ME 591. Individual Study in Mechanical Engineering. 1-6 Hour.
Individual Study in Mechanical Engineering.

ME 611. Advanced Fluid Mechanics. 3 Hours.
Fundamental laws of motion for viscous fluid, classical solutions of the Navier-Stokes equations, inviscid flow solutions, laminar boundary layers, and stability criteria.

ME 613. Introduction to Computational Fluid Dynamics. 3 Hours.
Review of governing equations of fluid dynamics, mathematical behavior of partial differential equations, basic aspects of discretization, basic CFD techniques, basic grid generation, coordinate transformations, advanced numerical schemes, future CFD methodology. A knowledge of a computer language is required.

ME 614. Advanced Computational Fluid Dynamics. 3 Hours.
Finite Volume Scheme, Eigenvalues and Eigenvectors, Method of Characteristics, Upwind Schemes, Flux Vector Splitting, Flux Difference Splitting, Explicit and Implicit Schemes, Flux Jacobians, Newton Method, Boundary Conditions, Weak Solutions, TVD, PISO Methods.

ME 615. Introduction to Turbulent Flows. 3 Hours.
Characteristics of turbulence, length and time scales, energy cascade, vorticity stretching, Reynolds averaging technique, Closure problem, Boussinesq hypothesis, Eddy viscosity concepts, introduction to zero-, one-, and two-equation models, Reynolds stress model.

ME 631. Dynammics and Mobility of Vehicles: Modeling and Simulation. 3 Hours.
The main goal of the course is to present advanced research and engineering knowledge in recent vehicle dynamics of road and off-road wheeled and track vehicles with an emphasis on vehicle longitudinal/lateral mobility and energy efficiency. Applications include vehicles for personal transportation, military vehicles, construction equipment and farm tractors. A unique feature of this course is its inverse vehicle dynamics approach. Another distinctive feature of the course is a mechatronics-based approach to modeling and simulation of multi-domain systems that include mechanical, electrical and electronics components such as sensors and actuators. Coupled and interactive dynamics of vehicle systems is presented, and a modeling process of vehicle operational properties is based on various equations of analytical and adaptive dynamics. Students will gain knowledge and analytical hands-on skills through innovative homework and a research project. Skills in one of programming software/languages are required (e.g., MATLAB/Simulink, ADAMS/Car, LabVIEW, etc.).

ME 632. Autonomous Wheel Power Management Systems: Theory and Design. 3 Hours.
The main goal of this course is to give detailed understanding, analytical knowledge and engineering experience in research, design and experimental study of autonomous wheel power management systems (AWPMS). The AWPMS are autonomous mechatronic and autonomously operated mechanical systems that distribute power among the drive wheels of vehicles. AWPMS include various configurations of torque vectoring systems, limited slip differentials and hydraulically controlled differentials, electronically-locking differentials, and positive engagement of the wheels. AWPMS that are operationally integrated with steering and suspension systems are also presented in the course. Characteristics of wheel power management systems for a specific vehicle application are proved in the course by using inverse vehicle dynamics formulation and requirements to vehicle energy efficiency, mobility, stability of motion, and turnability. Students will learn mechanical design principles for mechatronic systems and methods for developing control algorithms. Methods for experimental study of wheel power management systems and vehicles are also presented in the course; including 4x4 vehicle chassis dynamometer with individual wheel control and test setups. Students will exercise analytical skills and gain hands-on experience through innovative homework and a research project.

ME 640. Heat Conduction. 3 Hours.
Introduction to methods of solution for heat conduction problems. Topics include separation of variables in rectangular, cylindrical and spherical coordinates, solution to the heat equation on semi-infinite and infinite domains, Duhamel's Theorem, use of Green's Function, and use of the Laplace Transform. A basic understanding of heat transfer at the undergraduate level is required for this course.

ME 641. Radiation Heat Transfer. 3 Hours.
Introduction to radiation heat transfer. Topics include radiation from black bodies and nonblack opaque surfaces, configuration factors for diffuse surfaces, radiation exchange in enclosures of diffuse-grey and specularly reflecting surfaces, radiation combined with conduction and convection, and energy transfer for absorbing, emitting and scattering media. A basic understanding of heat transfer at the undergraduate level is required for this course.

ME 650. Transport Phenomena. 3 Hours.
Laminar flow transports: momentum transfer (Couette/Poiseuille flows), energy transfer (free/forced convections and conductions), and mass transfer; equation of state, turbulence, chemical reactions, and numerical methods solving transport equations. Introduction to Fluid Mechanics and Introduction to Heat Transfer or equivalents are recommended prerequisites for this course.

ME 661. Math Methods in EGR I. 3 Hours.
Mathematical theory and solutions methods to problems in engineering including advanced ordinary differential equations; euigenvalue problems; multi-variable calculus and implicit functions; curve, surface ad volume representation and integration; Fourier integrals and transforms; separation of variables and transform techniques for solution of partial differential equations. Differential Equiations or equivalent is recommended as a prerequisite for this course.

ME 662. Math Methods in EGR II. 3 Hours.
Mathematical theory and solution methods to problems in engineering including Scalar and vector field theory advanced partial differential equations, analysis using complex variables, conformal mapping, complex integral calculus, Green's functions, perturbation methods, and variational calculus. Math Methods in EGR I or equivalent is recommended as a prerequisite for this course.

ME 663. Engineering Statistics. 2 Hours.
Introduction to applied statistics and probability for engineering and the physical sciences. Topics include introduction to probability, discrete and random variables and their distributions, joint probability distributions, hypothesis testing, statistical inference, linear regression and correlation, design of experiments, and statistical quality control. A basic understanding of calculus and matrix algebra at the undergraduate level is required for this course.

ME 665. Computational Methods in EGR. 3 Hours.
Applications of computers to solution of problems in engineering, including matrices, roots of equations, solution of simultaneous equations, curve fitting by least squares, differentiation and integration, differential and partial differential equations. Differential Equations and Computational Engineering or equivalents are recommended prerequisites for this course.

ME 670. Intro to Continuum Mechanics. 3 Hours.
Fundamentals and application of mechanics principles to problems in continuous media. Matrix and tensor mathematics, fundamentals of stress, kinematics and deformation of motion, conservation equations, constitutive equations and invariance, linear and nonlinear elasticity, classical fluids, linear viscoelasticity. Mechanics of Solids and Differential Equations or equivalents are recommended prerequisites for this course.

ME 672. Advanced Dynamics. 3 Hours.
Advanced topics in dynamics including complex motion analysis, generalized kinematic parameters, quasivelocities, and virtual displacements, direct and inverse dynamics approach, and fundamentals of systems with variable masses. Introduction to the modeling of mechatronic systems is presented through a consideration of mechanical,electrical and electronics components. Analytical and adaptive dynamics principles are taught as a basis for control algorithm development and mechatronic system design.

ME 675. Mechanics of Plates and Shells. 3 Hours.
Equations of motion from classical Kirchoff plate theory, with solutions for cylindrical bending, buckling, and natural vibration of plate strips, rectangular plates and circular plates. Navier, Levy and Rayleigh-Ritz solutions for rectangular plates under various boundary conditions. First and third order shear deformation plate theories with analytical and numerical solutions. Finite element models based on both classical and shear deformation plate theories.

ME 679. Advanced Finite Element Analysis. 3 Hours.
Concepts and applications of finite element method. Development and applications of various elements used in engineering mechanics. Use of finite element analysis software. Application of finite element concept and model development to fluid, heat transfer, and solid mechanics problems. Introduction to Fluid Mechanics, Introduction to Heat Transfer, and Mechanics of Solids or equivalents are recommended prerequisites for this course.

ME 688. Fluid-Structure Interactions. 3 Hours.
Modeling and simulation of fluid-structure interaction (FSI) phenomena using computational methods. The Arbitrary Lagrangian Eulerian (ALE) formulation, a variety of interpolation methods, mesh movement and time mapping algorithms. Solution of FSI problems using interface codes.

ME 690. Special Topics in (Area). 1-6 Hour.
Special Topics in (Area).

ME 691. Individual Study in (Area). 1-6 Hour.
Individual Study In (Area).

ME 698. Non-Thesis Research. 1-12 Hour.

ME 699. Thesis Research. 1-12 Hour.
Prerequisites: GAC M

ME 711. Advanced Fluid Mechanics. 3 Hours.
Fundamental laws of motion for viscous fluid, classical solutions of the Navier-Stokes equations, inviscid flow solutions, laminar boundary layers, and stability criteria.

ME 713. Introduction to Computational Fluid Dynamics. 3 Hours.
Review of governing equations of fluid dynamics, mathematical behavior of partial differential equations, basic aspects of discretrization, basic CFD techniques, basic grid generation, coordinate transformation, advanced numerical schemes, future CFD methodology. A knowledge of a computer language is required.

ME 714. Advanced Computational Fluid Dynamics. 3 Hours.
Finite Volume Scheme, Eigenvalues and Eigenvectors, Method of Characteristics, Upwind Schemes, Flux Vector Splitting, Flux Difference Splitting, Explicit and Implicit Schemes, Flux Jacobians. Newton Method, Boundary Conditions, Weak Solutions, TVD, PISD Methods.

ME 715. Introduction to Turbulent Flows. 3 Hours.
Characteristics of turbulence, length and time scales, energy cascade, vorticity stretching, Reynolds averaging techniques. Closure problem, Boussinesq hypothesis, Eddy viscosity concepts, introduction to zero-, one-and two-equation models, Reynolds stress model.

ME 731. Dynamics and Mobility in Vehicles: Modeling and Simulation. 3 Hours.
The main goal of the course is to present advanced research and engineering knowledge in recent vehicle dynamics of road and off-road wheeled and track vehicles with an emphasis on vehicle longitudinal/lateral mobility and energy efficiency. Applications include vehicles for personal transportation, military vehicles, construction equipment and farm tractors. A unique feature of this course is its inverse vehicle dynamics approach. Another distinctive feature of the course is a mechatronics-based approach to modeling and simulation of multi-domain systems that include mechanical, electrical and electronics components such as sensors and actuators. Coupled and interactive dynamics of vehicle systems is presented, and a modeling process of vehicle operational properties is based on various equations of analytical and adaptive dynamics. Students will gain knowledge and analytical hands-on skills through innovative homework and a research project. Skills in one of programming software/languages are required (e.g., MATLAB/Simulink, ADAMS/Car, LabVIEW, etc.).

ME 732. Autonomous Wheel Power Management Systems: Theory and Design. 3 Hours.
The main goal of this course is to give detailed understanding, analytical knowledge and engineering experience in research, design and experimental study of autonomous wheel power management systems (AWPMS). The AWPMS are autonomous mechatronic and autonomously operated mechanical systems that distribute power among the drive wheels of vehicles. AWPMS include various configurations of torque vectoring systems, limited slip differentials and hydraulically controlled differentials, electronically-locking differentials, and positive engagement of the wheels. AWPMS that are operationally integrated with steering and suspension systems are also presented in the course. Characteristics of wheel power management systems for a specific vehicle application are proved in the course by using inverse vehicle dynamics formulation and requirements to vehicle energy efficiency, mobility, stability of motion, and turnability. Students will learn mechanical design principles for mechatronic systems and methods for developing control algorithms. Methods for experimental study of wheel power management systems and vehicles are also presented in the course; including 4x4 vehicle chassis dynamometer with individual wheel control and test setups. Students will exercise analytical skills and gain hands-on experience through innovative homework and a research project.

ME 740. Heat Conduction. 3 Hours.
Introduction to methods of solution for heat conduction problems. Topics include separation of variables in rectangular, cylindrical and spherical coordinates, solution to the heat equation on semi-infinite and infinite domains, Duhamel's Theorem, use of Green's Function, and use of the Laplace Transform. A basic understanding of heat transfer at the undergraduate level is required for this course.

ME 741. Radiation Heat Transfer. 3 Hours.
Introduction to radiation heat transfer. Topics include radiation from black bodies and nonblack opaque surfaces, configuration factors for diffuse surfaces, radiation exchange in enclosures of diffuse-grey and specularly reflecting surfaces, radiation combined with conduction and convection, and energy transfer for absorbing, emitting and scattering media. A basic understanding of heat transfer at the undergraduate level is required for this course.

ME 750. Transport Phenomena. 3 Hours.
Laminar flow transports: momentum transfer (Couette/Poiseuille flows), energy transfer (free/forced convections and conductions), and mass transfer; equation of state, turbulence, chemical reactions, and numerical methods solving transport equations.

ME 761. Math Methods in EGR I. 3 Hours.
Mathematical theory and solutions methods to problems in engineering including advanced ordinary differential equations; euigenvalue problems; multi-variable calculus and implicit functions; curve, surface ad volume representation and integration; Fourier integrals and transforms; separation of variables and trsnform techniques for solution of partial differential equations. Differential Equiations or equivalent is recommended as a prerequisite for this course.

ME 762. Math Methods in EGR II. 3 Hours.
Mathematical theory and solution methods to problems in engineering including Scalar and vector field theory advanced partial differential equations, analysis using complex variables, conformal mapping, complex integral calculus, Green's functions, perturbation methods, and variational calculus. Math Methods in EGR I or equivalent is a recommended prerequistie for this course.

ME 763. Engineering Statistics. 3 Hours.
Introduction to applied statistics and probability for engineering and the physical sciences. Topics include introduction to probability, discrete and random variables and their distributions, joint probability distributions, hypothesis testing, statistical inference, linear regression and correlation, design of experiments, and statistical quality control. A basic understanding of calculus and matrix algebra at the undergraduate level is required for this course.

ME 765. Computational Methods in EGR. 3 Hours.
Applications of computers to solution of problems in engineering, including matrices, roots of equations, solution of simultaneous equations, curve fitting by least squares, differentiation and integration, differential and partial differential equations. Differential Equations and Computational Engineering or equivalents are recommended prerequisites for this course.

ME 770. Intro to Continuum Mechanics. 3 Hours.
Fundamentals and application of mechanics principles to problems in continuous media. Matrix and tensor mathematics, fundamentals of stress, kinematics and deformation of motion, conservation equations, constitutive equations and invariance, linear and nonlinear elasticity, classical fluids, linear viscoelasticity. Mechanics of Solids and Differential Equations or equivalents are recommended prerequisites for this course.

ME 772. Advanced Dynamics. 3 Hours.
Advanced topics in dynamics including complex motion analysis, generalized kinematic parameters, quasivelocities and virtual displacements, direct and inverse dynamics approaches, and fundamentals of systems with variable masses. Introduction to the modeling of mechatronic systems is presented through a consideration of mechanical, electrical, and electronics components. Analytical and adaptive dynamics principles are taught as a basis for control algorithm development and mechatronic system design. Students are expected to have a working knowledge of dynamics prior to registering for this course.

ME 775. Mechanics of Plates and Shells. 3 Hours.
Equations of motion from classical Kirchoff plate theory, with solutions for cylindrical bending, buckling, and natural vibration of plate strips, rectangular plates and circular plates. Navier, Levy and Rayleigh-Ritz solutions for rectangular plates under various boundary conditions. First and third order shear deformation plate theories with analytical and numerical solutions. Finite element models based on both classical and shear deformation plate theories.

ME 779. Advanced Finite Element Analysis. 3 Hours.
Concepts and applications of finite element method. Development and applications of various elements used in engineering mechanics. Use of finite element analysis software. Application of finite element concept and model development to fluid, heat transfer, and solid mechanics problems. Introduction to Fluid Mechanics, Introduction to Heat Transfer, and Mechanics of Solids or equivalents are recommended prerequisites for this course.

ME 788. Fluid-Structure Interactions. 3 Hours.
Modeling and simulation of fluid-structure interaction (FSI) phenomena using computational methods. The Arbitrary Lagrangian Eulerian (ALE) formulation, a variety of interpolation methods, mesh movement and time mapping algorithms. Solution of FSI problems using interface codes.

ME 790. Special Topics in ME. 1-6 Hour.
Special Topics in (Area).

ME 791. Individual Study in (Area). 1-6 Hour.
Individual Study in (Area).

ME 796. IEGR Journal Club. 1 Hour.
Journal club to discuss current research and investigations in areas of interdisciplinary engineering.

ME 798. Non-Dissertation Research. 1-12 Hour.
Research.

ME 799. Dissertation Research. 1-12 Hour.
Research.
Prerequisites: GAC Z

MSE-Material Science Egr Courses

MSE 501. Materials Processing. 3 Hours.
Processing of metals, glasses, ceramics, and composites. Powder, casting, welding, rapid solidification, and other advanced approaches.

MSE 505. Frontiers of Automotive Materials. 3 Hours.
Advanced lightweight automotive materials, manufacturing and modeling techniques. Technology advancements in cost-effective carbon, glass and related reinforcements; "green" and sustainable materials, crashworthiness and injury protection of occupants and pedestrians, metal castings, heavy truck, mass transit, fuel cell and hybrid vehicles. Students taking this class will receive a GATE certificate of training in automotive materials technologies upon successful completion.

MSE 508. Nanobiomaterials. 3 Hours.
Basic tools of nanotechnology, building blocks of nanostructured materials. Behavior of materials with nanoscale structures and their technological applications, including automotive, medical, and electronic applications. Introduction to biomaterials and nanobiomaterials, nanotoxicity and how to work safely with nanomaterials. Concepts in tissue engineering with special focus on nanoscaffolds and nanoparticles in drug delivery.

MSE 509. Principles of Metal Casting. 3 Hours.
Production and evaluation of cast ferrous metals (gray iron, ductile iron, steel) and non-ferrous metals (brass, bronze, aluminum). Design of castings and molds. Laboratory on the gating, risering and molten metal treatment, analysis and handling techniques required to produce high quality castings. It is recommended that students who register for this course have successfully completed MSE 280 Engineering Materials or an equivalent course.

MSE 509L. Principles of Metal Casting. 0 Hours.
Laboratory component of MSE 509 and must be taken concurrently.

MSE 513. Composite Materials. 3 Hours.
Processing, structure, and properties of metal-, ceramic-, and polymer-matrix composite materials. Roles of interfacial bond strength, reinforcement type and orientation and matrix selection in physical and mechanical properties of composite materials.

MSE 525. Statistics and Quality. 3 Hours.
This course is arranged to reflect the sequential steps an engineer or scientist take to assess process capability and implement process improvement studies. There is a focus on connecting the theoretical equations to practical examples as well as interpreting and communicating of statistical results.

MSE 530. Polymeric Materials. 3 Hours.
Processing methods, structure/engineering/property relationships, and applications of polymeric materials.

MSE 530L. Polymeric Materials Lab. 0 Hours.
Laboratory component of MSE 530 and must be taken concurrently.

MSE 533. Nondestructive Evaluation of Materials. 3 Hours.
Principles, applications, and limitations of ultrasonic vibrations, acoustic emission, radiographic, magnetic particle, eddy current, and other nondestructive testing methods. Intelligent sensors and health monitoring of real structures.

MSE 545. The Evolution of Engineering Materials. 3 Hours.
Past, present and future of engineering materials; how new materials and processing methods have impacted human society, from the Stone Age until today. Taught as a 3-week study abroad course in Germany, with visits to universities, industrial facilities, research labs, museums and selected cultural sites.

MSE 562. Composites Manufacturing. 3 Hours.
Principles of manufacturing and processing of polymeric matrix composites. Production techniques including filament winding, pultrusion, and liquid infusion techniques combined with design, environmental and manufacturing issues of polymer matrix composites.

MSE 564. Metals and Alloys. 4 Hours.
Microstructures, properties, heat treatment, and processing of ferrous and nonferrous materials.

MSE 564L. Metals and Alloys Lab. 0 Hours.
Laboratory component of MSE 564 and must be taken concurrently.

MSE 565. Characterization of Materials. 4 Hours.
Theory and practice of materials characterization, with emphasis on optical metallography, quantitative metallography, scanning electron microscopy, crystallography, and x-ray diffraction. Specific application in metals and ceramics considered.

MSE 565L. Characterization of Materials Laboratory. 0 Hours.
Laboratory component of MSE 565 and must be taken concurrently with MSE 565.

MSE 570. Ceramic Materials. 4 Hours.
Structure, processing, properties, and uses of ceramic compounds and glasses. Mechanical, thermal, and electrical behavior of ceramic materials in terms of microstructure and processing variables.

MSE 570L. Ceramic Materials Laboratory. 0 Hours.
Laboratory component of MSE 570 and must be taken concurrently.

MSE 574. Metals and Alloys II. 3 Hours.
Production and physical metallurgy of ferrous and non-ferrous alloys including: steel alloys, inoculation and production of ductile, gray, compacted and malleable iron; advanced heat treatments of steel and iron; conventional and ultra-high strength aluminum alloys; wrought and cast copper alloys; wrought and cast magnesium alloys.

MSE 590. Special Topics in Materials Science & Engineering. 1-3 Hour.
Special Topics in Materials Science & Engineering.

MSE 591. Individual Study in Materials Science & Engineering. 1-6 Hour.
Individual Study in Materials Science & Engineering.

MSE 601. Materials Science and Engineering Seminar. 0 Hours.
Seminar focusing on student research and guest presentations of various topics of interest to materials students.

MSE 602. Intro to Thermodynamics and Mechanics of Materials. 3 Hours.
This course is a survey of undergraduate level theory and application of the fundamental principles of mechanics of materials and thermodynamics. Understanding is based on the explanation of the physical behavior of materials under load and then modeling this behavior to develop the theory. Intended to provide the students with both the theory and application of the fundamental principles of thermodynamics of materials. Students must be graduate student in engineering, chemistry or physics.

MSE 603. Thermodynamics of Materials. 3 Hours.
Atomistic and classical approaches to the understanding of the thermodynamics of solids, phase transformations, chemical reactions, and alloy systems.

MSE 605. Introduction to Physical Materials. 3 Hours.
Overview of fundamental concepts of materials science and engineering, focusing on chemical and physical properties such as bonding, crystal structure and defects, diffusion, and phase diagrams.

MSE 606. Introduction to Manufacturing Engineering. 3 Hours.
Manufacturing is the process of transforming raw materials into products. Even the most optimized and controlled industrial processes are fraught with variability and inefficiencies, both of which can have a negative impact on profitability. This course will introduce students to the proven tools to characterize and optimize industrial processes. In addition, students will learn the statistical techniques to quantitative assess and detect changes to a process and make data-driven decisions to improve that process.

MSE 607. Measurement Systems Analysis. 3 Hours.
Whether in a manufacturing process, research & development lab or quality control, assessment and analysis of data used for decision making has roots in the equipment and procedures that make up a measurement system. Students will learn to critically assess the capability of measurements systems, gauges and analytical equipment used to collect data. Students will learn metrology, best practices, and statistical tools to quantitatively assess, as well as procedures to implement a Gage R&R study to improve a measurement system. In addition, students will learn effective communication strategies for presenting the results of statistical analysis.

MSE 608. Process Characterization and Advanced Statistical Analysis. 3 Hours.
This course centers on manufacturing processes and the inherent variability of all products. Product variability has origins at all input points in a process; raw materials, energy, time, human, etc. This course will expose engineers to the statistics to quantify and assess variability. In addition to statistical tools, we will delve deep into all phases of the DMAIC (Define, Measure, Analysis, Improve, and Control) methodology and the Lean/Six Sigma tools to identify, implement and document process improvements. An emphasis will be placed on the communication of these often-complicated statistics in an industrial setting. We will put these concepts into practice through completion of a final term paper. Students will be required to choose an industrial process and apply and communicate the concepts learned in this course.

MSE 610. Advanced Materials, Manufacturing and Applications Development. 3 Hours.
Introduction to advanced materials by design, near net-shape cost-effective manufacturing, synergistic knowledge of material properties, durability and function. Hands on activities related to extrusion-compression, fiber spinning, thermoset/thermoplastic materials, medical grade materials, intermediate forms and hybrid manufacturing. Integrated process and product development methodology. Student projects will involve manufacturing processes associated with mass production.

MSE 613. Mechanical Behavior of Materials. 3 Hours.
Microstructural effects on the deformation mechanisms responsible for mechanical behavior of engineering materials.

MSE 614. Process Quality Engineering. 3 Hours.
Application of the concepts and tools of total quality to develop, implement, and maintain an effective quality assurance system in a materials processing and manufacturing environment. Students will be exposed to probability models, statistical tools, linear and multiple regression, DOE, TQM and six sigma.

MSE 624. Physical Metallurgy. 3 Hours.
Course will consider the fundamental thermodynamic and kinetic principles governing the behavior of metals and alloys, particularly with respect to their influence the formation and evolution of microstructure. Topics will include liquid-solid and solid-state phase transformations, nucleation, growth, solidification and diffusion.

MSE 625. Plasma Processing of Materials. 3 Hours.
This Online course is designed to introduce the concepts, fundamentals, and applications of plasma surface processing to materials science and engineering students. This is a 3-credit hour graduate level course. This course will feature a primer on plasmas as a unique thermodynamic state of matter. Specifically, there will be an emphasis on non-equilibrium thermal states and how these are used in materials processing and surface engineering. Special topics including plasma generation, control, and diagnostics will be provided. Furthermore, Types of Plasmas, CVD process for polymerization and hard coating, Corona treatment of fibers for composites, spark plasma sintering, plasma- spray coating, etc. surface characterization of plasma-processed surfaces will be discussed in detail: including structure/property relationships, surface morphology (including nanoscale features), and surface chemistry and their relationships to functional surface design. Spectroscopic techniques including x-ray photoelectron spectroscopy (XPS), optical emission spectroscopy (OES) and Surface mechanical properties testing (Nanoindentation) and contact angle measurements. Additional topics will be covered as time in the semester permits. This course will give prospective students a wide coverage of plasma tools and techniques toward functional material design.

MSE 628. Thermal Characterization. 3 Hours.
This lab-oriented course will be focused to give graduate students the theory and hands-on experience in operation, data acquisition and interpretation of widely used thermal characterization techniques such as differential scanning calorimeter (DSC), thermo gravimetric analyzer (TGA) , Simultaneous TGA-DTA, Thermo mechanical analyzer (TMA), Dynamic mechanic analyzer (DMA) and rheological and viscosity analyses of polymeric resins and composite materials. Exposure to TGA combination techniques with chemical analysis (Fourier Transform infrared spectrometer (FT-IR), Gas Chromatography (GC) and Mass spectrometry (MS)).

MSE 628L. Thermal Characterization Lab. 0 Hours.
Laboratory component of MSE 628 and must be taken concurrently.

MSE 629. Polymer Structure and Morphology. 3 Hours.
Polymer structures and morphology and it's relationships with applications, multicomponent polymer systems (polymer blends, copolymers, micro and nanocomposites), liquid crystalline polymers, polymer crystals, oriented polymers, morphological aspects of deformation and advances in polymers (biomimetic and bioinspired polymer systems).

MSE 633. Advanced Mechanics of Deformation. 3 Hours.
Basics and intermediate mechanics of deflection of beams and columns, mechanics of impact, failure theories, plastic deformation of materials, fracture mechanics, fatigue, creep and vibration. The topics will be supported by industry relevant case studies. Suggested prerequisites included Mechanics of Solids (CE 220) and Mechanical Behavior (MSE 382).

MSE 635. Advanced Mechanics of Composites. 3 Hours.
Classical lamination theory, analysis and failure of reinforced composite material systems, anisotropic elasticity, stress analysis and design of laminated composites including 3D effects, stress concentrations, free-edge effects, hygrothermal behavior, adhesive and mechanical connections.

MSE 636. Engineering Fibers. 3 Hours.
Processing-microstructure-properties of different fibrous materials: natural polymeric fibers (jute, sisal, silk, etc.), synthetic polymeric fibers (aramid and polyethylene, etc.), metallic fibers, and high performance ceramic fibers (alumina and silicon carbide). Application of Weibull statistics to strength of fibrous materials, techniques of mechanical testing of fibers and applications of fibers in various fields.

MSE 638. Degradation of Materials. 3 Hours.
Basics of materials degradation- thermodynamics and kinetics - Pourbaix diagram, chemical and electrochemical reactions; Degradation types and mechanisms; Degradation of different material systems: Metals, alloys, ceramics and glasses, polymers and composites for versatile applications- structural, functional, energy and biomedical; Impact on materials properties; Investigation for materials degradation; Protection from degradation and materials design;Environmental and biological aspects; Societal impact.

MSE 667. Process Modeling/Simulation. 3 Hours.
Theory and practice of analytical methods and computational modeling for manufacturing processes of metals, ceramics, polymers and composites. Applications on processes such as metal cutting, welding, casting, massive forming, solidification, rapid prototyping, injection molding and resin transfer molding.

MSE 668. Applied Finite Element Analysis. 3 Hours.
Finite Element Analysis (FEA) is used widely for design optimization and failure prediction in automobile, energy, aerospace, and other industries. This course primarily looks at how practically to set up static structural models and get meaningful results. The focus will be on applying loading and boundary conditions, good meshes, convergence of results, and correct interpretation of results. Students will learn how to set up models using programs such as Pro/Engineer and ANSYS.

MSE 670. Physical Characterization. 3 Hours.
Theory and practice of materials characterization, with emphasis on optical metallography, quantitative metallography, scanning electron microscopy, crystallography, and x-ray diffraction. Specific application in metals and ceramics considered.

MSE 670L. Physical Characterization Lab. 0 Hours.
Laboratory component of MSE 670 and must be taken concurrently.

MSE 690. Special Topics In (Area). 1-6 Hour.
Special Topics in (Area).

MSE 690L. Special Topics in (Area) Laboratory. 0 Hours.
Special Topics in (Area) laboratory.

MSE 691. Individual Study in (Area). 1-6 Hour.
Individual Study in (Area).

MSE 698. Non-Thesis Research. 1-12 Hour.

MSE 699. Thesis Research. 1-12 Hour.
Prerequisites: GAC M

MSE 701. Materials Science and Engineering Seminar. 0 Hours.
Seminar focusing on student research and guest presentations of various topics of interest to materials students.

MSE 702. Intro to Thermodynamics and Mechanics of Materials. 3 Hours.
This course is a survey of undergraduate level theory and application of the fundamental principles of mechanics of materials and thermodynamics. Understanding is based on the explanation of the physical behavior of materials under load and then modeling this behavior to develop the theory. Intended to provide the students with both the theory and application of the fundamental principles of thermodynamics of materials. Students must be graduate student in engineering, chemistry or physics.

MSE 703. Thermodynamics of Materials. 3 Hours.
Atomistic and classical approaches to the understanding of the thermodynamics of solids, phase transformations, chemical reactions, and alloy systems.

MSE 705. Introduction to Physical Materials. 3 Hours.
Overview of fundamental concepts of materials science and engineering, focusing on chemical and physical properties such as bonding, crystal structure and defects, diffusion, and phase diagrams.

MSE 710. Advanced Materials, Manufacturing and Applications Development. 3 Hours.
Introduction to advanced materials by design, near net-shape cost-effective manufacturing, synergistic knowledge of material properties, durability and function. Hands on activities related to extrusion-compression, fiber spinning, thermoset/thermoplastic materials, medical grade materials, intermediate forms and hybrid manufacturing. Integrated process and product development methodology. Student projects will involve manufacturing processes associated with mass production.

MSE 714. Process Quality Engineering. 3 Hours.
Application of the concepts and tools of total quality to develop, implement, and maintain an effective quality assurance system in a materials processing and manufacturing environment. Students will be exposed to probability models, statistical tools, linear and multiple regression, DOE, TQM and six sigma.

MSE 724. Physical Metallurgy. 3 Hours.
Course will consider the fundamental thermodynamic and kinetic principles governing the behavior of metals and alloys, particularly with respect to their influence the formation and evolution of microstructure. Topics will include liquid-solid and solid-state phase transformations, nucleation, growth, solidification and diffusion.

MSE 725. Plasma Processing of Materials. 3 Hours.
This Online course is designed to introduce the concepts, fundamentals, and applications of plasma surface processing to materials science and engineering students. This is a 3-credit hour graduate level course. This course will feature a primer on plasmas as a unique thermodynamic state of matter. Specifically, there will be an emphasis on non-equilibrium thermal states and how these are used in materials processing and surface engineering. Special topics including plasma generation, control, and diagnostics will be provided. Furthermore, Types of Plasmas, CVD process for polymerization and hard coating, Corona treatment of fibers for composites, spark plasma sintering, plasma- spray coating, etc. surface characterization of plasma-processed surfaces will be discussed in detail: including structure/property relationships, surface morphology (including nanoscale features), and surface chemistry and their relationships to functional surface design. Spectroscopic techniques including x-ray photoelectron spectroscopy (XPS), optical emission spectroscopy (OES) and Surface mechanical properties testing (Nanoindentation) and contact angle measurements. Additional topics will be covered as time in the semester permits. This course will give prospective students a wide coverage of plasma tools and techniques toward functional material design.

MSE 728. Thermal Characterization. 3 Hours.
This lab-oriented course will be focused to give graduate students the theory and hands-on experience in operation, data acquisition and interpretation of widely used thermal characterization techniques such as differential scanning calorimeter (DSC), thermo gravimetric analyzer (TGA) , Simultaneous TGA-DTA, Thermo mechanical analyzer (TMA), Dynamic mechanic analyzer (DMA) and rheological and viscosity analyses of polymeric resins and composite materials. Exposure to TGA combination techniques with chemical analysis (Fourier Transform infrared spectrometer (FT-IR),Gas Chromatography (GC) and Mass spectrometry (MS)).

MSE 728L. Thermal Characterization Lab. 0 Hours.
Laboratory component of MSE 728 and must be taken concurrently.

MSE 729. Polymer Structure and Morphology. 3 Hours.
Polymer structures and morphology and it's relationships with applications, multicomponent polymer systems (polymer blends, copolymers, micro and nanocomposites), liquid crystalline polymers, polymer crystals, oriented polymers, morphological aspects of deformation and advances in polymers (biomimetic and bioinspired polymer systems).

MSE 733. Advanced Mechanics of Deformation. 3 Hours.
Basics and intermediate mechanics of deflection of beams and columns, mechanics of impact, failure theories, plastic deformation of materials, fracture mechanics, fatigue, creep and vibration. The topics will be supported by industry relevant case studies. Suggested prerequisites included Mechanics of Solids (CE 220) and Mechanical Behavior (MSE 382).

MSE 735. Advanced Mechanics of Composites. 3 Hours.
Classical lamination theory, analysis and failure of reinforced composite material systems, anisotropic elasticity, stress analysis and design of laminated composites including 3D effects, stress concentrations, free-edge effects, hygrothermal behavior, adhesive and mechanical connections.

MSE 736. Engineering Fibers. 3 Hours.
Processing-microstructure-properties of different fibrous materials: natural polymeric fibers (jute, sisal, silk, etc.) synthetic polymeric fibers (aramid and polyethylene, etc.), metallic fibers, and high performance ceramic fibers (alumina and silicon carbide). Application of Weibull statistics to strength of fibrous materials, techniques of mechanical testing of fibers and applications of fibers in various fields.

MSE 738. Degradation of Materials. 3 Hours.
Basics of materials degradation- thermodynamics and kinetics - Pourbaix diagram, chemical and electrochemical reactions; Degradation types and mechanisms; Degradation of different material systems: Metals, alloys, ceramics and glasses, polymers and composites for versatile applications- structural, functional, energy and biomedical; Impact on materials properties; Investigation for materials degradation; Protection from degradation and materials design;Environmental and biological aspects; Societal impact.

MSE 767. Process Modeling/Simulation. 3 Hours.
Theory and practice of analytical methods and computation modeling for manufacturing processes of metals, ceramics, polymers and composites. Applications on processes such as metal cutting, welding, casting, massive forming, solidification, rapid prototyping, injection molding, and resin transfer molding.

MSE 768. Applied Finite Element Analysis. 3 Hours.
Finite Element Analysis (FEA) is used widely for design optimization and failure prediction in automobile, energy, aerospace, and other industries. This course primarily looks at how practically to set up static structural models and get meaningful results. The focus will be on applying loading and boundary conditions, material properties, meshing, convergence, and correct interpretation of results. Students will learn how to set up models using programs such as Solidworks and ANSYS.

MSE 770. Physical Characterization. 3 Hours.
Theory and practice of materials characterization, with emphasis on optical metallography, quantitative metallography, scanning electron microscopy, crystallography, and x-ray diffraction. Specific application in metals and ceramics considered.

MSE 770L. Physical Characterization Lab. 0 Hours.
Laboratory component of MSE 770 and must be taken concurrently.

MSE 790. Special Topics in (Area). 1-6 Hour.
Special Topics In (Area).

MSE 790L. Special Topics in (Area) Laboratory. 0 Hours.
Special Topics in (Area) Laboratory.

MSE 791. Individual Study in (Area). 1-6 Hour.
Individual Study in (Area).

MSE 798. Non-Dissertation Research. 1-12 Hour.

MSE 799. Dissertation Research. 1-12 Hour.
Prerequisites: GAC Z

MSEM-Engineering Management Courses

MSEM 590. Special Topics in Engineering Management. 1-3 Hour.
Special Topics in Engineering Management.

MSEM 591. Individual Study in Engineering Management. 1-6 Hour.
Individual Study in Engineering Management.

MSEM 640. Systems Engineering. 3 Hours.
This course will explore systems engineering and systems thinking. Students will learn key topics related to engineering products and design, including requirements development, the project life cycle, system hierarchy, risk analysis, and cost analysis. They will learn that systems engineering is iterative and will develop judgment that will allow them to compare and evaluate engineering alternatives. They will learn to discuss systems engineering methods and processes as well as engage in systems thinking.

MSEM 650. Technical Project Management. 3 Hours.
Students will learn the common methodologies used to manage complex projects in technology organizations. They will learn how to successfully plan, schedule, budget, and complete projects. Topics will include the PMP, Six Sigma, Lean, and other methodologies. Students will take part in several class exercises that will allow them to use different project management skills. The format of the class will consist of lecture and general discussion. There will also be significant portions of class time dedicated to project based activities.

MSEM 660. Professional Development for Engineers. 3 Hours.
This course prepares students to make the transition from student to working engineer. Students will develop skills in personal branding, career planning, strategic career search, networking, teamwork, leadership, professional communications, time management, measuring value, and professional etiquette. In addition, students will learn how to find and develop opportunities and how to use social media to enhance and protect their personal brand.

MSEM 695. Engineering Management Design Project. 3 Hours.
This course is for students who already have a relevant job or internship and are part of the Master of Engineering Management program. The purpose of this course is to be a capstone program where the skills and concepts learned in the MSEM are applied to a real industry issue. This project will be performed in partnership with your current employer by defining a project on the job and working with MSEM faculty to meet core deliverables.

MSEM 696. Engineering Management Internship. 3 Hours.
This course is an internship and will be conducted in cooperation with an employer and the School of Engineering's Director of Career Services. Students will work with an industry partner and then provide a final report.

Interdisciplinary Engineering (PhD)

Degree Offered	Interdisciplinary Engineering PhD
Website	https://www.uab.edu/engineering/home/graduate/interdisciplinary-phd
Program Director	Gregg M. Janowski, PhD
Email	janowski@uab.edu
Program Administrator	Kristy Barlow, MPA
Email	kbarlow@uab.edu

Program Objectives

Today's professional must constantly change, adapt, focus, and navigate among disciplines to keep up with rapid market shifts and technological advances. Because of these market trends, industries are particularly interested in interdisciplinary graduate education that emphasize both breadth of knowledge and depth in a particular field. The premise of interdisciplinary programs is that students must be educated in multiple related subject areas to remain competitive and have successful careers in academia or industry. The PhD Program in Interdisciplinary Engineering provides a rigorous academic curriculum including coursework in two or more disciplines and unique opportunities for interdisciplinary research.

The Interdisciplinary Engineering PhD program draws upon strengths of the five departments in the School of Engineering: Biomedical Engineering; Civil, Construction, and Environmental Engineering; Electrical and Computer Engineering; Materials Science and Engineering; and Mechanical Engineering. Students enrolled in the Interdisciplinary Engineering PhD program will gain the skills to succeed as independent and productive investigators in multidisciplinary analysis and design, with applications over a wide spectrum of science, engineering, health, and medical fields.

The program provides unique opportunities for interdisciplinary research and fosters interdisciplinary collaborative interactions between students and faculty in the School of Engineering, the Schools of Business, Medicine, and Public Health and the College of Arts and Sciences. Interdisciplinary Engineering students have opportunities to develop a plan of study and a dissertation research topic that incorporates coursework and faculty expertise from two or more of disciplines across UAB.

The interdisciplinary program will:

- Provide a rigorous academic curriculum including coursework in two or more disciplines
- Provide collaborative interactions with students and faculty from a variety of disciplines
- Provide unique opportunities for interdisciplinary research
- Facilitate continued development of high-quality research programs supported by external funding.

Admission Requirements

Admission decisions are made on the basis of prior education, GPA, test scores, personal statement, professional experience, and recommendations.

In addition to the Graduate School admission requirements, admission to the Interdisciplinary Engineering PhD program includes the following:

- Undergraduate or graduate degree in Engineering. Applicants who do not meet this criterion but who have an outstanding academic record in a related field may be admitted but will be required to complete a sequence of undergraduate courses (including prerequisites as appropriate) in addition to the normal requirements of the IE PhD degree
- Minimum GPA of 3.0 on a 4.0 scale on most recent degree
- GRE is not required
- Personal statement identifying research interest
- CV/Résumé
- 3 academic or professional recommendations
- Interview with Program Director and Manager
- International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details
- Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School

(detailed instructions are included during the online application process);

Deadline for Entry Term(s):	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office:	Seven days before term begins

Degree Requirements

Graduate Committee

Because of the interdisciplinary nature of the program, the graduate study committee (dissertation committee) is important. The committee will oversee the selection of courses and direction of research. Students must form a graduate committee within the first year of study and must meet with the committee no less than once per academic year. Committees must have at least five members selected from at least two different Schools/Colleges, with a minimum of two faculty with primary appointment in the School of Engineering.

Coursework

The IE PhD promotes a research-based curriculum with a set of core courses required of all students in the program. Additional coursework is directed by the student's graduate study committee based on the student's area of interest. The planned curriculum must result in training in two or more disciplines, which is defined as courses offered outside the School of Engineering.

Students entering the PhD program with a baccalaureate degree must, in keeping with UAB Graduate School policies, complete at least 48 hours of coursework prior to admission to candidacy. Up to 16 of the 48 credits can be non-dissertation research, and up to 10 credits can be a combination of laboratory rotations, seminars, and directed study.

Students entering the PhD program with a Master’s degree in a related field, MD, DMD, etc., must complete at least 27 credit hours of coursework prior to candidacy. Up to 6 credits of the 27 can be non-dissertation research credits, and up to 6 credits can be as lab rotations, seminars, or directed study credits.

For all students, at least 24 hours of dissertation research are required and must be taken over at least two semesters after admission to candidacy.

Students entering with a baccalaureate degree must complete the following:

Requirements		Hours
Journal Club - 4 enrollments of 1 hour each		4
EGR 796	Journal Club in Interdisciplinary Engineering [1]	
GRD 717	Principles of Scientific Integrity	3
Engineering Electives		9
Cross Disciplinary Electives		9
Dissertation Research		24
Additional Electives		23
Total Hours		**72**

[1] Students may substitute a different graduate-level seminar/journal club with permission of his/her faculty mentor and the program director.

Students entering with a Master's degree must complete the following:

Requirements		Hours
Journal Club - 4 enrollments of 1 hour each		4
EGR 796	Journal Club in Interdisciplinary Engineering [1]	
GRD 717	Principles of Scientific Integrity	3
Engineering Electives		9
Cross Disciplinary Electives		9
Dissertation Research		24
Additional Electives		2
Total Hours		**51**

[1] Students may substitute a different graduate-level seminar/journal club with permission of his/her faculty mentor and the program director.

In addition to the IE PhD program core courses (above), course selection is based on the research and career goals of the student, and curricula will vary between students. Students are guided by their faculty mentor (committee chair) and a graduate study committee composed of faculty representing an interdisciplinary team in the student's area of research interest. The coursework must include courses from at least two disciplines.

These courses will be completed under the guidance of the student's faculty mentor (graduate study committee chair). Non-dissertation research and dissertation research hours will be taken through the department of the student's faculty mentor.

Comprehensive Examination

Interdisciplinary Engineering PhD students are required to pass a comprehensive examination, which includes both written and oral components, and a dissertation proposal. The examination is administered by the student's graduate study committee. Upon successful completion of the examination and at least 39 hours of coursework if entering with a baccalaureate degree or 18 hours of coursework if entering with a Master's degree, a student may apply for doctoral candidacy. All doctoral students must successfully complete GRD 717 prior to admission to candidacy.

Research and Dissertation

The dissertation is the summation of the doctoral studies and must demonstrate the ability to conduct, analyze, and defend independent research consistent with the dissertation proposal. The graduate study committee must provide feedback on the dissertation draft prior to scheduling the defense. Doctoral candidates present and defend their work before their graduate study committee and the public as their final examination. See the UAB Graduate School website for formatting guidelines and deadlines.

Additional Requirements

Students are required to present research at a local, regional, national, or international technical conferences and publish research findings in at least two peer-reviewed journals. The IE PhD program director will not approve the student's application for degree without evidence that the articles were published, are in press, or have been submitted.

PhD students are required to complete the degree within 7 years, per Graduate School requirement. Any student who does not meet this requirement must appeal to the Graduate School for an extension.

Additional Academic Policies

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined hours of Special Topics and/or Independent Study courses will be applied to the Interdisciplinary Engineering PhD without appeal to and approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

Students admitted into the Interdisciplinary Engineering PhD program are not permitted to transfer to another program within the School of Engineering.

Master of Science in Engineering Managment (M.S.E.M.)

Degree Offered	Master of Science in Engineering Management (MSEM)
Website	https://www.uab.edu/engineering/mme/graduate/ms-materials
Director	Dale W. Callahan, PhD, PE
E-mail	msem@uab.edu
Phone	(205) 934-8480

The Master of Science in Engineering Management (MSEM) is a joint degree between the School of Engineering and the Collat School of Business. The MSEM will further develop the technical, managerial, and professional capabilities of engineering graduates, preparing them for earlier entry into positions of leadership within a wide variety of industries and organizational types. The technical engineering coursework emphasizes a systems-oriented, multidisciplinary approach to solving complex problems. The managerial and professional coursework develops essential business acumen, an ability to think strategically, and a commitment to professional work habits that are the hallmark of excellence in engineering.

Graduates will be well-prepared for positions as engineers, project managers, program managers, product managers, consultants, technical sales representatives, technical sales support specialists, and engineering managers. They will have the knowledge and skills to manage an organization's relationship with technology vendors, evaluate technical proposals, develop internal technical training and education programs, or bring both a business and a technical perspective to cross-functional teams focused on strategic alignment or evaluation of emerging technologies. Graduates will also be prepared to pursue advanced degrees.

Master of Science in Engineering Management

Admissions Requirements

Applicants to the program are expected to have one of the following:

- An undergraduate engineering degree with a minimum GPA of 3.0 on a 4.0 scale, or
- Junior or senior standing in good standing with a minimum GPA of 3.0 on a 4.0 scale in an engineering undergraduate degree program (undergraduate degree must be earned prior to matriculation)

International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details

Application Deadlines

Entry Term	Deadline
Application Submission Deadline for Entry Terms	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School office	Seven business days before term begins (see UAB academic calendar - https://www.uab.edu/students/academics/academic-calendar)

Curriculum

The MSEM degree consists of 18 hours of core courses, 3 hours of capstone or internship, and 12 hours of student-selected coursework with guidance from the Program Director.

The MSEM degree allows the student to have both professional management knowledge and in-depth technical knowledge of the chosen field of study (biomedical, civil, construction, environmental, electrical, computer, materials, mechanical, or structural engineering).

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined hours of Special Topics and/or Independent Study courses will be applied to the MSEM without appeal to and approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

Requirements		Hours
MBA 601	Accounting and Finance for Managers	3
MBA 651	Marketing Strategy	3
MBA 681	From Idea to IPO	3
or MBA 683	Leading Innovation	
MSEM 640	Systems Engineering	3
MSEM 650	Technical Project Management	3
MSEM 660	Professional Development for Engineers	3
MSEM 695	Engineering Management Design Project	3
or MSEM 696	Engineering Management Internship	

Additional Coursework [1]	**12**
Total Hours	**33**

[1] 12 credit hours of engineering coursework focused on student's chosen area of learning

Masters of Engineering (M.Eng.)

In an effort to meet increasing industry demands for highly skilled workers, the School of Engineering offers a professional Master of Engineering program with a variety of concentrations. The following concentrations are designed to benefit working professionals who seek to increase their qualifications:

- ASEM: Advanced Safety Engineering and Management
- CECM: Construction Engineering Management
- CESC: Sustainable Smart Cities
- CESE: Structural Engineering
- IEM: Information Engineering Management

UAB, a world-class, regionally accredited (SACSCOC) university, provides a wide-ranging fully online engineering program with five distinct, in-demand concentrations designed for working professionals. All courses are comprised of real-world, practical knowledge and content to help our graduates advance in their careers.

All Master of Engineering concentrations are 100% online and are comprised of real-world, practical knowledge and content to help our graduates advance in their careers. There are no campus classes or required on-campus meetings or activities. Course delivery includes asynchronous and synchronous learning modes. Students are provided 24/7 support throughout the program.

Advanced Safety Engineering and Management Concentration

Please Note: All Master of Engineering concentrations are 100% online. There are no campus classes or required on-campus meetings or activities. Course delivery includes asynchronous and synchronous learning modes.

Degree Offered	Master of Engineering
Website	http://www.uab.edu/asem
Program Email:	asem@uab.edu
Director	Donald S. Burke, III, PhD
Email	dburke3@uab.edu
Phone	205-975-3891
Address	UAB School of Engineering, HOEN 370
	1720 2nd Avenue South
	Birmingham, AL 35294-4440

The Master of Engineering with a concentration in Advanced Safety Engineering and Management is designed for students to explore injury and catastrophe prevention through a different paradigm. Through a “Prevention through Design” approach, ASEM students examine error-provocative environments as a means to design away risk. By teaching students both the language of engineering as well as safety concepts, graduates are able to bridge the divide between design engineers and occupational safety and health professionals.

Instructors

The MEng-ASEM graduate program is taught by a team of practicing safety and health professionals with Dr. Donald Burke serving as overall Graduate Program Director. Practitioner-Scholars facilitate online discussions on key topics of interest in their industry sector and provide industry-specific case studies Students participate in peer-to-peer learning activities discussing current topics of interest and real-world experiences using online discussion boards and online live class dialogues.

Admission

In addition to the Graduate School admissions requirements, admission to the UAB MEng-ASEM program requires the following:

- Undergraduate degree from a regionally-accredited insitution
- Minimum 3.0 GPA on 4.0 scale
  - Applicants not satisfying the above requirements may receive admission on a provisional basis subject to assessment and recommendation of the program director
- Experience in a safety profession
- Three letters of recommendation, at least one of which must be from a current or former direct supervisor
- Resumé/CV
- Personal essay (a brief summary of academic interests, career goals, and relevant safety experience)
- Official transcripts; refer to the UAB Graduate School website for more information about submitting transcripts
- International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details

To apply, visit the UAB Graduate School’s website and click the ‘Apply Now’ button.

Application Deadlines	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office	Fall: August 1; Spring: December 1; Summer: May 1

Master of Engineering with a concentration in Advanced Safety Engineering and Management

Students must earn a B or better in two attempts to meet graduation requirements.

Requirements		Hours
Required Courses		
ASEM 601	ASEM Seminar [1]	0
ASEM 610	Introduction to System Safety - Prevention through Design	3
ASEM 619	Capstone Project - Part 1	3
ASEM 620	Capstone Project - Part 2	3
Electives		**24**
ASEM 611	Hazard Analysis and Waste Elimination	

ASEM 612	Engineering Risk	
ASEM 613	Human Performance and Engineering Design	
ASEM 614	Engineering Ethics and Acceptable Risk	
ASEM 615	Leading through Climates of Change	
ASEM 616	Policy Issues in Prevention through Design	
ASEM 617	Crisis Leadership	
ASEM 626	Learning-Based Response to Organizational Accidents and Incidents	
ASEM 627	Communication in Safety Systems	
ASEM 628	Electrical Systems Safety	
ASEM 630	Machinery Safety Management System	
ASEM 640	Introduction to Model-based Safety Assessments	
ASEM 690	Special Topics in (Area) [2]	
ASEM 691	Individual Study in (Area) [2]	
Total Hours		**33**

[1] Must be taken each semester

[2] With Graduate Program Director approval; no more than 6 combined credit hours of ASEM 690 and ASEM 691 may be applied to the degree

Coordinated ASEM/MBA Program

The UAB School of Engineering and the Collat School of Business have partnered to offer a coordinated Advanced Safety Engineering Management/MBA degree.

Application Process

Students interested in pursuing the dual ASEM/MBA degree must complete a separate MBA application through the UAB Graduate School's application system. Deadline for applications will be as follows:

Required Documents

Completed application including:

- Résumé/CV
- Statement of purpose
- Three letters of recommendation from professional contacts[1]
- Transcripts from all colleges and universities attended[2]
- The TOEFL and GMAT requirement will be waived for applicants admitted to the ASEM program.

Degree Requirements

Students will have 5 years from term of entry to complete the degree. Courses older than 5 years may be used towards the degree if revalidated by the Graduate School of Management. The MBA degree consists of 12 required courses (36 semester hours). Six hours of elective credit will be waived with completion of comparable courses in the ASEM program.

Curriculum

Please refer to the MBA/ASEM section of the catalog for specifics regarding curriculum.

Completion of Degree

Students must file an application for degree with the MBA advising office during the term preceding their final semester. The MBA degree will be awarded at the completion of the ASEM and MBA degree requirements.

Construction Engineering Management Concentration

Please Note: All Master of Engineering concentrations are 100% online. There are no on-campus classes or required on-campus meetings or activities. Course delivery includes asynchronous and synchronous learning modes. Proper computer equipment and high-speed internet direct access are required to be successful.

Degree Offered	Master of Engineering
Website	http://www.uab.edu/engineering/cem
Director	Wesley Zech, PhD, LEED AP
Email	zechwes@uab.edu
Director of CEM Student Affairs	Dianne Gilmer, MEng, PMP
Email	digilmer@uab.edu
Phone	205-975-5848
Address	UAB School of Engineering, HOEN 130B
	1720 2nd Avenue South, Birmingham, AL 35294-4440

The Master of Engineering with a concentration in Construction Engineering Management (MEng-CEM) is designed to enhance the construction engineering management and business qualifications of working professionals interested in project and company/corporate management.

Admission Requirements

In addition to the Graduate School admission requirements, admission to the UAB MEng-CEM includes the following:

1. **Bachelor's degree** (any discipline) from a regionally accredited US college or university. CEM promotes a multi-discipline learning experience and therefore an engineering undergraduate degree is not required;
2. An **undergraduate GPA** of 3.0 or higher (individuals not meeting this requirement but who have a strong professional background, references, and interview may be admitted);
3. **No GRE required**;
4. International applicants must submit **English proficiency scores** in accordance with UAB Graduate School requirement. Click here for details;
5. **Original transcripts** sent directly to the UAB Graduate School per their policy for degree-seeking students (detailed instructions are included during the online application process);
6. Two years of **relevant construction industry work experience** or a bachelor's degree in engineering or a science-related field;
7. **Personal interview** with the Director of CEM Student Affairs (schedule the interview prior to submitting a application);
8. Three **letters of recommendation** from professional contacts;
9. **Personal essay** detailing motivation and career aspirations for earning the degree; and
10. **Résumé/Curriculum Vitae**

To apply: Visit the UAB Graduate School website and click the 'Apply Now' button. Choose MEng - Construction Engineering Management in the *Program Applying To* section.

Deadline for Entry Term(s)	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office	Seven business days before term begins (see https://www.uab.edu/students/academics/academic-calendar)

Curriculum Requirements

Requirements		Hours
CECM 669	Advanced Project Management	3
CECM 670	Construction Estimating and Bidding	3
CECM 671	Construction Liability & Contracts	3
CECM 672	Construction Methods and Equipment	3
CECM 673	Project Planning and Control	3
CECM 674	Green Building Design/Construction	3
CECM 675	Advanced Construction and Engineering Economics	3
CECM 676	Construction Project Risk Management	3
CECM 688	Construction Management and Leadership Challenges in the Global Environment	3
CECM 689	Building Information Modeling (BIM) Techniques	3
Total Hours		**30**

Sustainable Smart Cities Concentration

Please Note: All Master of Engineering concentrations are 100% online. There are no on-campus classes or required on-campus meetings or activities. Course delivery includes asynchronous and synchronous learning modes. Proper computer equipment and high-speed internet direct access are required to be successful.

Degree Offered	Master of Engineering
Website	http://www.uab.edu/engineering/smartcities
Director	Jason T. Kirby, PhD
E-mail	jtkirby@uab.edu
Phone	205-934-8479
Address	UAB School of Engineering, HOEN 340
	1720 2nd Avenue South, Birmingham, AL 35294-4440

Admission Requirements

In addition to the Graduate School admission requirements, requirements for admission to the UAB MEng-SSC program includes the following:

- Bachelor's degree (any discipline) from a regionally accredited US college or university. SSC promotes a multi-discipline learning experience and therefore an engineering undergraduate degree is not required;
- An undergraduate GPA of 3.0 or higher (individuals not meeting this requirement but who have a strong professional background, references, and interview may be admitted);
- No GRE required
- International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details;
- Original transcripts sent directly to the UAB Graduate School per their policy for degree-seeking students (detailed instructions are included during the online application process);
- Personal interview with the Director of SSC (schedule the interview prior to submitting a application);
- Three letters of recommendation from professional contacts;
- Personal essay detailing academic motivation and career aspirations in SSC; and
- Résumé/Curriculum Vitae

Application Submission Deadline for Entry Term(s)	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office	Seven business days before term begins (see UAB academic calendar - https://www.uab.edu/students/academics/academic-calendar)

Requirements		Hours
CESC 600	Principles of Sustainable Development	3
CESC 602	Introduction to Sustainable Smart Cities	3
CESC 604	Low-Carbon and Renewable Energy Systems for Smart Cities	3
CESC 606	Managing Natural Resources and Sustainable Smart Cities	3
CESC 608	Green Infrastructure and Transportation	3
CESC 610	Health and Livability	3
CESC 612	Green Buildings	3
CESC 614	Smart Cities Technologies	3
CESC 616	Big Data and Smart Cities	3
CESC 618	Research Methods and Project Planning	3
Total Hours		**30**

Information Engineering Management Concentration

Please Note: All Master of Engineering concentrations are 100% online. There are no campus classes or required on-campus meetings or activities. Course delivery includes asynchronous and synchronous learning modes.

Degree Offered	Master of Engineering
Website	http://www.uab.edu/iem
Program Director	Dale W. Callahan, PhD, PE
Program Manager	Scarlett Naftel, MS
Email	iem@uab.edu
Phone	(205) 934-8480

Admission Requirements

In addition to the Graduate School admission requirements, admission to the UAB MEng-IEM program includes the following:

1. An undergraduate degree from a regionally accredited university: preference is given to engineering, math, science or technical-related undergraduate degrees

2. Official transcripts from every college/university attended
3. Résumé/CV showing relevant industry work experience
4. Three letters of recommendation from professional contacts
5. An essay answering the questions listed on the IEM website Apply Now page
6. An interview with the IEM admissions committee
7. No GMAT/GRE required for admission to IEM
8. International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details

To Apply:

Visit the UAB Graduate School website and click the 'Apply Now' button to complete an application.

Application Submission Deadline for Entry Term(s)	Fall: August 1; Spring: December 1; Summer: April 15
Deadline for All Application Materials to be in the Graduate School Office	Six weeks before term begins (see UAB academic calendar - https://www.uab.edu/students/academics/academic-calendar)

Late Applicants

Applicants who miss the Graduate School's deadline for admission may apply as "non-degree seeking" and pay an additional application fee. Late applicants are still required to submit the paperwork outlined above. The non-degree seeking deadline is typically 2-4 weeks before classes begin.

Curriculum

Requirements		Hours
IEM 601	Introduction to IEM	1
IEM 602	Leading Collaborative Teams	1
IEM 603	Communication for Technology Executives	1
IEM 610	Communication for Technology Professionals	3
IEM 611	Leading Technical Organizations	3
IEM 612	Project Leadership	3
IEM 620	Technical Entrepreneurship	3
IEM 625	Technology and Innovation	3
IEM 630	Systems Engineering	3
IEM 631	Operational Decision-Making	3
IEM 645	Financial Concepts for Entrepreneurs	3
IEM 646	Strategic Planning	3
IEM 695	IEM Design Project	3
Total Hours		**33**

ASEM-Adv Safety Engineering Courses

ASEM 601. ASEM Seminar. 0 Hours.
Seminar focusing on student research and guest presentations of various topics of interest to safety and risk management engineers and safety professionals.

ASEM 610. Introduction to System Safety - Prevention through Design. 3 Hours.
This course sets the foundation for the ASEM program by providing an overview of all major topic areas and an introduction to many of the tools and approaches to system safety, management systems, and human factors. Topics of inquiry include the processes of hazard analysis and risk assessment, error and error-provocative environments, drift, ISO 45001, systems thinking, prevention through design, and decision making. Course content is presented in a research-to-practice format where students apply course content to their own business environment and bring their organization into the classroom. Guest lecturers from diverse backgrounds will discuss their experiences in managing safety in the workplace. Participation in periodic live dialogues is required. The course must be taken during the first semester.

ASEM 611. Hazard Analysis and Waste Elimination. 3 Hours.
Hazards have the potential to cause harm to people, planet, and profits. Hazard analysis is a process that begins with the identification of a hazard and proceeds into an estimate of the severity of harm or damage that could result if the potential is realized and a hazard-related incident occurs (ASSE TR-Z790.001 – 2009). This course examines engineering techniques utilized to systematically and logically identify and analyze hazards in the workplace. These techniques include preliminary hazard list (PHL), preliminary hazard analysis (PHA), and Operating and Support Hazard Analysis (O&SHA). Students work in teams to use the PHA to retrospectively analyze a real-world disaster. Additionally, many hazard analysis processes ultimately end up assigning blame or finding human error as a cause of hazards and accidents. The 5 Principles of Human Performance will be introduced to help students understand how people are a vital part of the system. Students will apply these 5 principles to their team PHA project and to an Individual O&SHA project.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 612. Engineering Risk. 3 Hours.
Engineering risk is defined both quantitatively and qualitatively as an estimate of the probability that a hazard-related incident will occur and of the severity of harm or damage that could result. This course provides students with tools to assess and reduce safety risks in their own company. These tools include risk assessment matrices, probabilistic risk assessment (PRA) measures, including event tree analysis, fault tree analysis, and other prevention through design concepts. The role of a structured, formalized decision analysis process in preventing serious injuries and fatalities is also explored. Students engage in a risk mitigation decision analysis project, which is specific to their company and/or business sector. Guest lecturers from diverse industries discuss their experiences in assessing and managing risk. Live participation in a weekly 1.5 hour online forum is required.
Prerequisites: ASEM 611 [Min Grade: B]

ASEM 613. Human Performance and Engineering Design. 3 Hours.
Companies can miss important opportunities to eliminate waste if they rely primarily on training to prevent human error. This course explores the historical perspective on human error and serious injury. The course material will provide a solid understanding of the principles of occupational biomechanics and human tolerance to injury with focus on human anthropometry and mechanical work capacity. This course also includes studies of human reliability, static analysis of systems in equilibrium and mechanical systems, design and performance. Due to the quantity of back related injuries and related lost time in the workplace, back pain and injury is studied along with the effect of vibration on the human body. Real-world case studies provide for application of the engineering hierarchy of controls: hazard elimination, hazard substitution, engineering controls, warnings, administrative behavior controls, and personal protective equipment. The course also examines the design aspects of ergonomics, the biomechanical engineering basis of injury prevention, and the long-term economic consequences of seemingly minor injuries. In semester projects, students perform incident investigations using biomechanical and other data. After gathering and analyzing data to determine injury causation, they will identify and re-design error-provocative environments in their own workplaces. Guest lecturers from diverse backgrounds will discuss their experiences with human performance and/or biomechanics. Live participation in a weekly 1.5 hour online forum is required.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 614. Engineering Ethics and Acceptable Risk. 3 Hours.
This course explores the economic, social, and political consequences of safety risk and considers provocative real-world dilemmas: What is acceptable risk? Are the fundamental canons of engineering ethics and safety ethics contrary to the concept of acceptable risk? What is the worth of human life? Students will conduct critical reviews of corporate safety and ethics policies from their own company. Real-world case studies provide the framework for exercises and are used throughout course discussion boards, assignments, and dialogues. Participation in periodic live dialogue is required.
Prerequisites: ASEM 610 [Min Grade: B](Can be taken Concurrently)

ASEM 615. Leading through Climates of Change. 3 Hours.
All progressive companies are moving toward greater sustainability - protecting people, planet, and profits. To guide their companies through these changes and integrate safety into the priorities at the executive level, safety engineers and professionals must have strong leadership skills. This course explores engineering leadership best practices, including the eight steps of transformational leadership - creating a sense of urgency, creating a guiding coalition, developing a vision and strategies, communicating the vision, empowering broad-based action, generating short term wins, consolidating gains and anchoring the culture. This course also explores the concept of Resilience Engineering and helps students understand the impacts of socio-technical risks. Guest lecturers from diverse industries discuss their experiences in managing change in today's global business environment. Live participation in a weekly 1.5 hour online forum is required.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 616. Policy Issues in Prevention through Design. 3 Hours.
This course provides an overview of best practices in four major policy areas: (1) cost-benefit analysis; (2) corporate culture and the "HR Department"; (3) standards, codes, and regulations; and (4) strategic alliance development. Case studies are used to illuminate both the role of engineers and other safety professionals in shaping public policy on the local, national and international levels and the ethical challenges they encounter. The significance of an organization's corporate culture in developing and implementing advanced safety management plans is also explored. Students conduct "gap analyses" of their company's policies by comparing them to best practices and identifying unintended consequences of poor safety policy in their own business and industry sector. Students will engage in discussion board posts on contemporary policy issues and participate in exercises related to federal rulemaking. Guest lecturers from diverse backgrounds will discuss their experiences with policy issues. Live participation in a weekly 1.5 hour online forum is required.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 617. Crisis Leadership. 3 Hours.
Leadership requires more than the predication, control, and management of the vast network of influences that make up our work, especially in times of crisis. By its nature, a crisis is an unpredicted event that requires sensemaking and innovation to go beyond immediate recovery, to step forward into learning. We can only do this when we value, trust, and communicate with the people in our systems. This course will explore why complex adaptive systems are different and may be understood and influenced by leadership at all levels before, during, or after a crisis. Students will assess their own organizational culture through the artifacts, espoused values, and deep assumptions and learn to shape these through relationships, sensemaking, and divergent thinking. This course includes two-week long learning modules based on a combination of written discussion boards that emphasize academic rigor, small group dialogues, network mindmapping, and dynamic online Zoom classes with the professors.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 619. Capstone Project - Part 1. 3 Hours.
This course is designed to understand how to apply many of the ASEM topics and bring to bear the competencies acquired through the program. Part of this is developing an understanding of the complex nature of human contributions. Students will be challenged to correlate learnings from the ASEM Program that lead to the creation of safer work systems and in so doing develop a concept for their capstone project.
Prerequisites: ASEM 612 [Min Grade: B] and (ASEM 613 [Min Grade: B] or ASEM 614 [Min Grade: B] or ASEM 615 [Min Grade: B] or ASEM 616 [Min Grade: B] or ASEM 617 [Min Grade: B] or ASEM 628 [Min Grade: B](Can be taken Concurrently)

ASEM 620. Capstone Project - Part 2. 3 Hours.
Accident investigations are an inevitable part of most industries, yet most incident analysis is based on models that were developed many decades ago. Current research indicates that 80% of accidents are attributed to human error. Yet few tools or processes are designed to examine the context of human actions. Human interactions exist in complex systems, which are by nature unpredictable. When we look at human involvement, we find that actions are influenced by conditions extant in the system. The goal of this course is to discover the importance of dedicating time and resources to understanding why humans are integral to safety in complex systems. Students will learn both the theory and practical application of new techniques that expand the ability of organizations to learn from events. Students will explore the history of accident investigation, its influence on culture, the importance of context in the evaluation of human actions, the inclusion of complex narratives in reports, and how to present their findings to leadership and the field. Overall, students will come away with a more practical ability to help their organization learn from events. The course structure is focused on case study analysis, peer-to-peer learning and research. Questions are designed to challenge current understanding of the human contribution to accidents and why actions or decisions made sense to those involved at the time.
Prerequisites: ASEM 617 [Min Grade: B] and ASEM 619 [Min Grade: B]

ASEM 626. Learning-Based Response to Organizational Accidents and Incidents. 3 Hours.
Accident investigations are an inevitable part of most industries, yet most incident analysis is based on models that were developed many decades ago. Current research indicates that 80% of accidents are attributed to human error. Yet few tools or processes are designed to examine the context of human actions. Human interactions exist in complex systems, which are by nature unpredictable. When we look at human involvement, we find that actions are influenced by conditions extant in the system. The goal of this course is to discover the importance of dedicating time and resources to understanding why humans are integral to safety in complex systems. Students will learn both the theory and practical application of new techniques that expand the ability of organizations to learn from events. Students will explore the history of accident investigation, its influence on culture, the importance of context in the evaluation of human actions, the inclusion of complex narratives in reports, and how to present their findings to leadership and the field. Overall, students will come away with a more practical ability to help their organization learn from events. The course structure is focused on case study analysis, peer-to-peer learning and research. Questions are designed to challenge current understanding of the human contribution to accidents and why actions or decisions made sense to those involved at the time.
Prerequisites: ASEM 617 [Min Grade: B]

ASEM 627. Communication in Safety Systems. 3 Hours.
Communication plays a powerful role in creating safety in the work environment. Effective language increases communication and can lead to individual and organizational learning during safety training, real-time work, and post-mission analysis. However, the meaning of our language is not constant – it changes based on the experience of the worker, the context of the event, and the culture that surrounds the work environment. Language can become ineffective, or even damaging, when meanings differ or go unchallenged. This can occur when definitions are assumed, linguistic shortcuts are taken, or when language bias demands a singular interpretation. Engineers work with mechanical systems, which can be defined by a specific language: e.g. binary oppositions, like turning a switch ‘on’ or ‘off’. However, engineers also work with other people and must take human factors into account, including effective communication. This is the case with safety specialists, who help create the system architecture and develop practical training for workers in risk and safety. These specialists may be expected to participate in accident investigations or incident reviews, which can be unintentionally biased by the language used, which lead away from learning opportunities.
Prerequisites: ASEM 617 [Min Grade: B]

ASEM 628. Electrical Systems Safety. 3 Hours.
There is a subset of occupational hazards characterized as low frequency, but with very high consequence (potential for catastrophic loss, fatality or permanent disabling injury). A mishap involving unintentional exposure or contact with electrical energy is one of the low frequency/high consequence exposures. We live in an electrical world, with electrical hazards embedded in nearly every aspect of daily living – at home, at work, in public places, and in recreational activities. This course explores hazards, risks and context of electrical mishaps coupled with a systems safety engineering approach to manage the risks. Course content is presented within the framework of real-world case studies from a variety of industry sectors, including, but not limited to, manufacturing, utilities, and health care and includes several guest lectures by leaders in the profession. Students apply course content to their own business environment. Live participation in a weekly 1.5 hour online forum is required.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 630. Machinery Safety Management System. 3 Hours.
Safeguarding technology and requirements has come a long way since the Industrial Revolution. Despite this progress, the lack of effective machine guarding and management has continuously been named one of OSHA’s topmost-cited violations. Most businesses assume that the machine manufacturer and installer have met safety compliance requirements, but have they? Some site safety professionals use a standard general safety checklist to verify machine safety requirements but is this enough? The goal of this course is to equip the student with working knowledge of machine safety through understanding and applying key machine safety compliance standards, e.g. ANSI B11.0, ANSI B11.19, NFPA 79, and ISO 13849-1. This course will focus on and apply to power-driven machines used to produce or process material. Within the course, students will evaluate their current machine management systems to determine obstacles, best practices, and solutions to further develop their knowledge of machine technology and management. Students will conduct a machine task-based risk assessment, utilize the hierarchy of control to select risk reduction measures, and verify and test selected safeguards to mitigate risks to an acceptable level. To ensure that the machine safety management process is sustainable, students will utilize ANSI Z10 or ISO 45001 to develop a machine safety management system outline to be used at their site or within a company.
Prerequisites: ASEM 610 [Min Grade: B]

ASEM 640. Introduction to Model-Based Safety Assessments. 3 Hours.
This course provides students an introduction to model-based engineering and methods to assess holistic safety risks in their own company. These tools include requirements development, functional decomposition, design architecture, probabilistic risk assessment (PRA) measures, including, failure mode effects and criticality analysis (FMECA), fault tree analysis (FTA), and other safety engineering concepts. The role of a structured, formalized model-based engineering process, used to identify and mitigate hazards, is explored. Students engage in a rigorous model-based safety analysis project.
Prerequisites: ASEM 612 [Min Grade: B]

ASEM 690. Special Topics in (Area). 1-6 Hour.
Special Topics.

ASEM 691. Individual Study in (Area). 1-6 Hour.
Individual study.

CECM-Construction Egr Mgmnt Courses

CECM 669. Advanced Project Management. 3 Hours.
Skills generally required for sound project management in a variety of management settings are studied in addition to specific management issues typically associated with engineering and construction companies. Students are introduced to the Project Management Institute's Body of Knowledge (PMBOK). A discussion of corporate organizational structures and the evolving use of project management processes helps establish an appreciation for the role of a Project Manager. The elements of a project and the role and responsibilities of the Project Manager are studied in depth. Students are also acquainted with risk management concepts, financial, labor, safety, equipment, and contracting issues facing managers in the engineering and construction environment. Particular emphasis is placed on individual management strengths and weaknesses, team building, and characteristics of successful companies. One of the primary vehicles for discussion will be small case studies from real companies and the outside reading of one or two relevant topical books.

CECM 670. Construction Estimating and Bidding. 3 Hours.
Provides an overview of typical construction delivery systems and the planning and contracting associated with each. A broad study of estimating methodologies ranging from rough "ball park" estimates to detailed unit pricing is presented focusing on labor, equipment, materials, subcontractors, job conditions, location, overhead, and profit. This course is intended to establish a basic understanding of the estimating process; and therefore, substantial course focus will be placed on the term group project.

CECM 671. Construction Liability & Contracts. 3 Hours.
This course provides an overview of the fundamental aspects of the laws that affect construction and engineering companies as well as the project owners. Particular emphasis is placed on contract forms and provisions related to liability for engineering design and construction companies, the roles of the typical participation in the process, and dispute resolution. Students will learn the importance of contract language negotiations and the impact of project risk transfer.

CECM 672. Construction Methods and Equipment. 3 Hours.
This course provides students a big-picture understanding of the construction methods employed to bring the concepts and designs of architects and engineers to physical reality. The importance of building codes is presented in the course material. Detailed study of typical building materials, design details, and construction methods are presented in a logical sequence. Students will understand the planning and deployment of equipment, materials, labor, and subcontractors using a variety of building material and system types. This course provides a necessary baseline of knowledge, vocabulary, and understanding of the role and activities of the designers, engineers, material suppliers, inspectors, and constructors in the commercial building process.

CECM 673. Project Planning and Control. 3 Hours.
This course provides a thorough understanding of the project scheduling process in construction planning and control. Students learn the relationship between the work breakdown structure, organization breakdown structure, and the activities used in developing project schedules. The Critical Path Method (CPM), Precedence Diagram Method (PDM), Program Evaluation and Review Technique (PERT), and Line of Balance (LOB) scheduling methods are discussed in detail to include hand calculations and powerful computer software products. The use of scheduling techniques for project control, resources constraint management, cash flow management, risk management, and project completion date management are investigated as is the importance of communications in the planning and monitoring/controlling processes. Students will experience hands on use with Primavera scheduling software.

CECM 674. Green Building Design/Construction. 3 Hours.
The course addresses the key concepts, viewpoints and fundamentals essential for understanding green building and construction. Materials are focused on how key stakeholders and their future collaborations can begin to incorporate sustainable construction practices for the betterment of the project (new construction and inventory rehabilitation). The course will include instruction suitable to prepare students for the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED©) Green Associates certification exam.

CECM 675. Advanced Construction and Engineering Economics. 3 Hours.
This course provides an extensive overview of financial and managerial accounting concepts for non-financial managers. Students will learn the basic elements of accounting (Generally Accepted Accounting Practices (GAAP)). They will understand how typical financial records and financial statements are established for companies. Once the basics are understood, students will study how financial data is used for internal cost controlling, planning, and budgeting. Fundamental financial calculations associated with the time value of money, debt instruments, taxes, inflation, and cash flow estimates are emphasized. Students will be expected to demonstrate proficiency in the use of Excel business functions in solving financial problems.

CECM 676. Construction Project Risk Management. 3 Hours.
This course addresses the methodologies employed in the engineering and construction industries to assist in rational decision-making in the face of uncertainty. The course reviews the fundamentals of common probabilistic theories and models, data sampling, hypothesis testing and the basics of Bayesian Decision Theory. In addition, basic financial analysis tools will be reviewed. Theoretical models will then be applied to specific examples encountered in engineering and construction decision making with emphasis on engineering economics applications.

CECM 688. Construction Management and Leadership Challenges in the Global Environment. 3 Hours.
This course is designed to prepare students to face the demanding management and leadership challenges facing construction and engineering industry leaders as competition becomes ever more globalized. The necessity to personally remain trained and relevant in the changing business environment is emphasized. Strategic planning, management and leadership in the built environment requires savvy leaders with exceptionally developed analytical and communications skills suitable for multi-disciplinary and multi-national ventures. Every individual and organization must continually innovate and reinvent to stay competitive. Students participate in a group project designed to reinforce the methodology associated with preparing and presenting a dynamic business plan. This course will provide the opportunity for students to discuss and research these concepts and to recognize the necessity to think independently, challenge conventional thinking, and visualize alternatives.

CECM 689. Building Information Modeling (BIM) Techniques. 3 Hours.
This course provides students with an overview of the evolution of BIM technology in the construction industry followed by hands-on training in the basic application of contemporary BIM software. Students will learn basic modeling skills and how to produce graphical presentations. Advanced applications of BIM technology will be discussed and demonstrated. Students will be provided with BIM software and will be required to complete a multi-step BIM model as a term project.

CESC-Sustainable Smart Cities Courses

CESC 600. Principles of Sustainable Development. 3 Hours.
The course will begin by discussing the concepts, viewpoints and fundamentals essential for understanding urban sustainable development agenda. This will be followed by the evaluation of international conferences and action items proposed by the scientific / professional community to advance sustainable smart cities development. You will review basic earth sciences to better evaluate the impact our anthropogenic activities have on the natural environment and therefore how to minimize adverse future outcomes. Throughout the course case studies of sustainable developments will be used to illustrate the value, challenges and limitations of this concept. In the end, you will possess the knowledge base needed to help advance sustainable smart cities development.

CESC 602. Introduction to Sustainable Smart Cities. 3 Hours.
This course introduces the issues surrounding sustainable development within cities and explores how the smart city concept can contribute to the urban sustainable development agenda. The course begins by considering the key characteristics of contemporary urbanization and the issues and challenges that these present for sustainability and urban environmental management. The meaning and nature of sustainability for cities will be discussed, followed by a consideration of the definitions of a smart city and a discussion of the key elements of a smart city including its contribution to both urban governance and the more effective and efficient management of natural resources. With reference to case studies the final part of the course will explore and evaluate the role that smart city processes and applications can play in enhancing the social, economic and environmental aspects of sustainable development within urban areas.

CESC 604. Low-Carbon and Renewable Energy Systems for Smart Cities. 3 Hours.
As the energy infrastructure is arguably the most important feature in any city energy efficiency and integration of renewable energy sources within urban areas are central to the smart city concept. This course will firstly explore why there is a need for the greater use of low carbon and renewable energy systems within cities, followed by an introduction to the range of low carbon and renewable energy technologies currently available. The course will then move on to introduce the concept of the smart grid and then explore the potential to integrate low carbon and renewable energy systems into smart grids in order to move towards cost-effective, efficient and more environmentally friendly energy provision within cities. Challenges and issues associated with the greater integration of low carbon and renewable energy systems into energy infrastructure within large urban areas will also be considered.

CESC 606. Managing Natural Resources and Sustainable Smart Cities. 3 Hours.
The course examines the challenges of resource use and management within the context of an urbanizing world, exploring how new concepts within the smart and sustainable city agenda may contribute to addressing these challenges. The course begins by considering contemporary patterns of resource use created by cities in the modern world at a variety of scales from the local to the global. New approaches in the form of ecosystem services and urban metabolism in relation to natural resource management are examined in terms of their contribution to developing a smart and sustainable city agenda. The course continues by exploring a selection of key natural resources challenges (e.g. water, energy, air quality and climate) and the development of new management approaches and strategies in these areas. The course concludes by examining the development of integrated environmental management systems and governance structures within which these new approaches can be implemented with reference to a series of case studies.

CESC 608. Green Infrastructure and Transportation. 3 Hours.
The course covers policy and technical issues related to sustainable transportation. The course begins by discussing the concepts, viewpoints and fundamentals essential for understanding sustainable transportation planning. Tools used to assess sustainability of transportation facilities and neighborhoods are introduced next. The course also presents design options in support of green infrastructure and transportation, including livable street design, and traffic calming applications. The course is expected to expand students' knowledge base on sustainable transportation issues and help them understand the concept of sustainable transportation toward the development of sustainable smart cities.

CESC 610. Health and Livability. 3 Hours.
This course will address the multidisciplinary aspects of urban environmental quality and its impact on human well-being. It will provide a critical appreciation of the factors which influence health, well-being and quality of life within contemporary urban environments, demonstrate the importance of genomics and health informatics in developing strategies for improving the health and well-being of urban citizens, explore the importance of urban design and the contribution of the development of food smart cities in improving both urban health and livability, and understand the increasingly important role of Information and Communications Technology (ICT) in facilitating delivery of effective and responsive urban health, well-being, and quality of life strategies.

CESC 612. Green Buildings. 3 Hours.
The course will begin by discussing the concepts, viewpoints and fundamentals essential for understanding green building and construction. Discussions will then be focused on how key stakeholders and their future collaborations can begin to incorporate sustainable construction practices for the betterment of the project (new construction and inventory rehabilitation). This will be followed by the evaluation of sustainable construction rating systems (LEED, BREEAM, etc.) and how they can be applied to occupied buildings throughout an urban environment. Modular case studies of sustainable construction projects (individual structures to entire community developments) will be used to illustrate the value, challenges and limitations of this concept. In the end, students will possess an expanded knowledge base needed to help advance sustainable smart cities development.

CESC 614. Smart Cities Technologies. 3 Hours.
This course gives students the opportunity to study emerging smart technologies that can be deployed and integrated together with the aim of improving overall building / city performance. The course provides an overview of technologies that can be used to: sense and measure physical parameters; acquire, process, and analyze various datasets; and make appropriate decisions / gives suitable instructions based on all available information. Specific technologies addressed include Data Acquisition, Telecommunications, Wireless Sensor Networks, and the Internet of Things. The course will also explore and evaluate how these emerging technologies can contribute to various smart cities / buildings priorities, namely Energy Management, Health, Safety, and Security.

CESC 616. Big Data and Smart Cities. 3 Hours.
The world is becoming increasingly digitally interconnected and this instrumentation, data collection, interconnection, storage, and analysis can provide the capacity to radically transform how cities monitor, manage and enhance their environmental quality and livability. This course will provide an introduction to what big data is and how it can contribute to the smarter, more sustainable management of cities. The course will begin by discussing the concepts of big data and the big data revolution, and an overview of the ways in which data can be captured, stored and analyzed. This will be followed by a consideration of how big data can be used by city managers to optimize: their use of physical and digital infrastructures; their sustainable use of natural resources; citizen service delivery; and citizen engagement, participation and urban governance. You will also be introduced to some of the challenges presented by big data, both the technological challenges and the ethical and social implications associated with collecting, storing and using big data. Throughout the course case studies of big data in action will be used to illustrate the value, challenges and limitations of big data in the smarter, more sustainable management of cities.

CESC 618. Research Methods and Project Planning. 3 Hours.
As a student of smart city processes and urban environmental management you need to understand the research process which enables you to take the knowledge and skills which you have learned and apply it to a specific urban sustainability / environmental management issue. This course is not intended to provide a training in research techniques, but rather to make you aware of a wide range of investigative and analytical methods and techniques using examples drawn from the areas of smart city approaches, urban sustainability and environmental management. Both quantitative and qualitative methodologies and primary and secondary data collection will be covered. You will be encouraged to reflect on the research process and its outcomes by critiquing research papers written from methodological standpoints. You will then apply this knowledge to create a viable research proposal for your own Sustainable Smart Cities Masters project. This proposal will require you to identify and justify for your chosen topic: (i) appropriate research questions, (ii) methodologies and data sampling / collection techniques, (iii) ethical and health and safety implications and, (iv) a timetable of action.

CESC 620. Sustainable Smart Cities Research Project. 0 Hours.
This course will develop skills in both research and technical writing in the area of applying and/or evaluating sustainable smart cities processes and policies to a specific urban environmental or sustainability issue. The research proposal produced as part of the Research Methods and Project Planning course will be implemented. This will involve further research into the relevant background and context of a chosen project topic, implementation and evaluation of appropriate methods for collecting and analyzing data, observations and information, the ability to present findings clearly and concisely, and appreciate their significance in relation to the smart city and sustainable urban management agendas. Research should be at the forefront of student's chosen sustainable smart cities research topic and be at a level similar to that required for acceptance and presentation at a national level conference or symposium on smart and sustainable cities. For students in relevant employment, projects may be carried out in your place of work subject to discussions between you, your employer/line manager, and your project supervisor.

CESE - Structural Engineering Courses

CESE 653. Wood and Masonry Design. 3 Hours.
Design of wood structures to meet the requirements of the National Design Specification including beams, columns, and shear walls. Design and detailing of masonry structures. Nomenclature, properties, and specifications for components. Design of assemblages and masonry elements in simple masonry structures.

CESE 656. Advanced Mechanics of Materials for Structural Engineering. 3 Hours.
This course will review the basic fundamentals of mechanics of materials and will extend the concepts to include 3-dimensional stress and strain, plastic behavior, energy methods, nonlinear behavior, fatigue and fracture, rectangular linear elastic plates, indeterminate structures and stability.

CESE 657. Advanced Design of Steel Structures. 3 Hours.
Design of major components in steel-framed buildings, including composite beams and slabs, beam-columns, moments connections, bracing members, bracing connections, and column base plates.

CESE 659. Advanced Reinforced Concrete. 3 Hours.
In this course students will study the behavior and design of continuous reinforced concrete structures submitted to gravity and lateral loads. The study will include biaxial loading of columns, continuous one-way beams and slabs, two-way floor systems, and torsion loading.

CESE 660. Prestressed Concrete Behavior and Design. 3 Hours.
The course will explore the characteristics and design of pre-stressed concrete structural components to include elastic and ultimate strength analyses for flexural, shear, torsion, deflection, strand bond, and pre-stress loss.

CESE 662. Advanced Structural Analysis. 3 Hours.
This course explores the structural analysis of indeterminate structures using classical and approximate methods and structural analysis software. Specific emphasis is placed on the determination of forces in typical multistory, rectilinear frames subject to gravity and lateral loads. In addition to first order analysis, the course included analysis for second order effects and plastic analysis.

CESE 664. Bridge Engineering. 3 Hours.
This course includes the study of bridge loads, including moving load analysis; methods for approximate structural analysis, preliminary bridge design methods, and the structural design of bridge decks and girders.

CESE 665. Structural Dynamics and Earthquake Engineering. 3 Hours.
This course includes the study of earthquake-induced vibrations of single and multi-degree-of-freedom systems, such as single and multistory frames. Emphasis will be placed on structural steel and reinforced concrete building frames. Response spectrum analysis will be investigated as well as building codes and static and dynamic lateral load force procedures.

CESE 676. Design of Structural Steel Connections. 3 Hours.
Design of bolted and welded steel connections, including shear, moment and brace connections using the AISC Specifications requirements and fundamental engineering principals. Design procedures will be discussed for various structural steel connections. The background and limitations of the design procedures will be reviewed and practical solutions will be provided.

CESE 690. Special Topics (Area). 1-3 Hour.
Special Topics (Area).

CESE 698. Non Thesis Research. 3 Hours.
No syllabus for non-thesis research hours.

IEM-Information Egr Mgmnt Courses

IEM 601. Introduction to IEM. 1 Hour.
This course is an introduction to Information Engineering and Management with a focus on readiness for graduate study. Program requirements and expectations will be presented. Software and collaboration tools will be introduced. Library access and resources will be reviewed and teams will perform learning exercises to demonstrate proficiency with the available tools.

IEM 602. Leading Collaborative Teams. 1 Hour.
This course will focus on building, leading, and evaluating collaborative teams. Topics will include managing geographically-dispersed teams, team communication, accountability, running effective meetings, facilitation skills, building consensus, and handling common problems.
Prerequisites: IEM 601 [Min Grade: C]

IEM 603. Communication for Technology Executives. 1 Hour.
This course will address communication issues unique to organizational executives. Topics will include functioning as the public face of the organization, working with the media, when to seek professional advice, and effective crisis management.
Prerequisites: IEM 602 [Min Grade: C]

IEM 610. Communication for Technology Professionals. 3 Hours.
This course focuses on recognizing, developing, and putting into practice effective communication skills. Lectures provide insights into presentation structure, style, and content. Self-evaluation exercises combined with personal coaching will help clients improve their professional speaking and presentation skills.

IEM 611. Leading Technical Organizations. 3 Hours.
This course will use case studies, assigned readings, guest lecturers, research projects, and discussion of current issues in technology to develop executive-level behaviors and thought-processes as preparation for starting or leading a technology organization.

IEM 612. Project Leadership. 3 Hours.
This course teaches the fundamental concepts of leading projects. The course will consider all aspects of project leadership including the use of standard methodologies. Best practices will be reviewed along with practical insights based on real-world project leadership experience.

IEM 620. Technical Entrepreneurship. 3 Hours.
This course is an introduction to entrepreneurship that begins with the development of personal insights and work habits that are fundamental to success within any organization.

IEM 625. Technology and Innovation. 3 Hours.
This course examines technological innovation as an element of organizational strategy. Topics include the nature and management of innovation, aligning technical teams with overall organizational strategy, and the role of innovation in launching and sustaining technology ventures.

IEM 630. Systems Engineering. 3 Hours.
This course focuses on the systems engineering lifecycle and its application to the design of complex systems. Topics include systems thinking, managing complexity, problem definition, solution design, solution implementation, quality assurance, and measuring effectiveness.

IEM 631. Operational Decision-Making. 3 Hours.
This course focuses on the critical role of information and analytical methods in optimizing operational decisions. A core set of analytical tools will be presented and discussed. Topics will include decision analysis, optimization, modeling, simulation, and data analysis.

IEM 645. Financial Concepts for Entrepreneurs. 3 Hours.
This course introduces financial concepts including the interpretation of financial statements, managing cash flow, time value of money, capital budgeting, and investment analysis.

IEM 646. Strategic Planning. 3 Hours.
This course will examine the nature of strategic thinking and the challenges of achieving strategic alignment. Topics will include the strategic planning process and methods for assessing strategic success.

IEM 690. Special Topics in Area. 1-3 Hour.
Special Topics in (Area).

IEM 695. IEM Design Project. 3 Hours.
This course is focused upon a final design project that incorporates the technical and entrepreneurial coursework taken previously. Projects will be assessed based on their technical design and financial justification.

IEM 696. IEM Internship. 1-3 Hour.
This course is available for students needing to register for an internship course while enrolled in the IEM program.

Neuroengineering

Degrees Offered	PhD
Website	www.uab.edu/engineering/home/neuroengineering
Program Co-Directo, Engineering	Jamie Tyler, PhD
Program Co-Directo, Medicine	Mark Bolding, PhD
Program Associate Director	Mark Bolding, PhD
Program Administrator	Kristy Barlow, MPA
E-mail	neuroeng@uab.edu

Admissions Requirements

- BS, MS, or be currently enrolled in the DMD/PhD or MD/PhD program at UAB*
- Minimum GPA of 3.0 on a 4.0 scale on most recent degree
- GRE is not required
- Personal statement identifying research interest
- CV/Résumé
- 3 academic or professional recommendations
- International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details;
- Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School (detailed instructions are included during the online application process)

* PhD students normally have earned a bachelor's degree in an engineering discipline or a closely-related field. Students with undergraduate degrees in the computer science, neuroscience, physical sciences, life sciences, or mathematics will also be considered for admission; however, such students must demonstrate preparation for the NE graduate curriculum. Admission to the NE PhD program is competitive.

Students admitted to the doctoral program typically receive a competitive stipend that includes payment of tuition. In addition to completing coursework requirements (see below), doctoral students must form a Graduate Dissertation Committee consisting of at least five faculty members, including the primary research mentor. At least one committee member must have a primary appointment in the School of Engineering and one must have a primary appointment in the School of Medicine. A written dissertation proposal must be orally presented to the committee and approved, at which time the student is admitted to candidacy. Admission to Candidacy must take place at least two semesters before the student may graduate. A written dissertation embodying the results of the student's original research must then be publicly defended, approved by the committee, and submitted to the Graduate School.

Publication Requirement. Original peer-reviewed research articles in reputable journals are the standard for demonstrating scientific productivity. The research conducted by NE doctoral students is expected to result in such publications. Before their degree is awarded, students are required to have at least one "first-author" journal article that has been published (or accepted for publication) and a second that has been submitted to a journal. Typically, a student's doctoral research will result in at least three first-author articles. Many students will be co-authors on collaborative research articles and may also share authorship on review articles, book chapters, conference proceedings, and other forms of scientific communication. Although these works bolster the student's scientific credentials, they do not count toward the NE publication requirement. In some cases, first-authorship of an article is shared among multiple individuals. In these cases, the article may count toward the publication requirement of only one doctoral student.

Additional Academic Policies

Special Topics courses and independent/individual study courses are reviewed for degree applicability to the degree. No more than 6 combined hours of Special Topics and/or Independent Study courses will be applied to the Neuroengineering PhD without appeal to and approval from the Program Directors.

UAB offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

Ph.D. in Neuroengineering

Requirements		Hours
GRD 717	Principles of Scientific Integrity	3
IDNE 701	Topics in Neuroengineering I	3
IDNE 702	Topics in Neuroengineering II	3
IDNE 720	Applications in Data Science	1
IDNE 796	Neuroengineering Journal Club [1]	6
BST 621	Statistical Methods I	3
or GRD 770	Intro to Biostats	
BST 622	Statistical Methods II	3
BME 717	Engineering Analysis	3
or ME 761	Math Methods in EGR I	
NBL 655	Synapses, Neurons and Brains	3
NBL 656	From Systems to Cog Neuro	3
EGR/CS Elective [2]		6
NS/LS Elective [3]		3
Other Electives [4]		
IDNE 773	Lab Rotation [5]	0
IDNE 798	Non-Dissertation Research	2
IDNE 799	Dissertation Research	24
Total Hours		**66**

1 Students must register for a minimum of 6 semesters; may also select another 700-level 1 hour Journal Club with Program Director approval.

2 Choose one from the following: CS 757, CS 760, CS 767, CS 773, CS 775, CS 785, EE 621, EE 641, EE 734, EE 738, EE 756, EE 758, ME 665.

3 Choose one from the following: GBS 714, GBSC 744, GBSC 718, GBSC 721, NBL 700, NBL 707, NBL 735, NBL 740, NBL 743, PY 707, PY 693, VIS 743, VIS 756, VIS 757.

4 Choose three from the following: GBS 714, GBS 722, GBSC 744, GBSC 718, NBL 740, NBL 743, PY 707, VIS 743, VIS 756, VIS 757, CS 760, CS 767, CS 773, CS 775, CS 785, EE 621, EE 641, EE 734, EE 738, EE 756, EE 758, ME 665, BST 623, BST 660, BST 680, BST 723.

5 Students who were not admitted directly into a lab ma register for a maximum of 4 rotations.

Biomedical Engineering

Degrees Offered	MSBME, PhD
Website	www.uab.edu/bme
Program Director	Prasanna Krishnamurthy, PhD
Program Administrator	Julie Calma
E-mail	uabbmegrad@uab.edu

Biomedical Engineering (BME) is the application of engineering principles and technology to the solution of problems in the life sciences and medicine. UAB is a top-25 institution for NIH funding, and BME graduate students have many opportunities to conduct cutting-edge multidisciplinary research. BME researchers enjoy collaborations across UAB's very active medical and dental schools as well as with researchers across the United States and beyond.

The BME Department offers Master of Science and PhD degrees. Students enrolled in UAB's MD/PhD or DMD/PhD programs may receive the PhD portion of their training in the Biomedical Engineering department. Students in any BME graduate program who are interested in the commercialization of biomedical technology are encouraged to complete the 12-hour Graduate Certificate in Technology Commercialization and Entrepreneurship offered by the Collat School of Business.

Admitted PhD students begin Fall term while MSBME students may be admitted for Fall or Spring. For full consideration, applications should be submitted by the priority deadline of January 15. Applications submitted as late as the UAB Graduate School's Fall deadline may be considered depending on the availability of positions.

A minimum score of 80 on the TOEFL (minimum of 18 on each subscore) or 6.5 on the IELTS is required for international students whose native language is not English. Additional details on the BME graduate programs are available in the current BME Graduate Student Handbook available at uab.edu/engineering/bme.

Students entering the MSBME program normally have earned a bachelor's degree in Biomedical Engineering, another engineering discipline, or a closely-related field. Students with undergraduate degrees in the physical sciences, life sciences, or mathematics will also be considered for admission; however, such students must demonstrate preparation for the BME graduate curriculum.

Admission to the MS program is competitive. Successful applicants typically have an undergraduate GPA of at least 3.5 (on a 4-point scale). However, applications are reviewed holistically and applicants with lower grades may be admitted based on factors such as strong GRE scores, research experience, or professional experience. Scores on the GRE General Test are not required but are accepted.

UAB offers Accelerated Bachelor's / Master's and Early Acceptance. To learn more about these programs, including requirements and how to apply, visit the Graduate School's ALO page.

Accelerated Bachelor-Master's Program in Biomedical Engineering

Biomedical Engineering offers an accelerated Bachelor's / Master's (ABM) option for high-achieving undergraduate students pursuing a BS degree in Biomedical Engineering at UAB. A successful graduate of ABM will earn both a bachelor's degree and a master's degree in BME from the University of Alabama at Birmingham in an accelerated time-frame compared to the independent completion of the two degrees.

To be considered for this program, students must have junior-level standing (more than 60 hours completed), have completed at least 3 of the required junior-level BME courses, and have a UAB GPA of at least 3.5. Applicants are expected to have already selected a research mentor for their graduate studies, which will typically be a continuation of their undergraduate research. Application to the program is through the normal UAB Graduate School application portal. One of the letters of recommendation must be from the research mentor. Once enrolled in the program, before completing their undergraduate degree, students may take up to 12 credit hours of approved graduate courses that will be applied to the MSBME degree. Note that coursework may not be applied toward both the undergraduate and graduate degrees. Students may pursue either the Plan I or Plan II MSBME option.

Graduate courses allowed for credit sharing are: BME 524 Current Topics in Stem Cell Engineering, BME 535 Tissue Engineering, BME 543 Medical Image Processing, BME 544 Machine Learning for Biomedical Engineering Applications, BME 550 Computational Neuroscience, BME 562 Cardiac Electrophysiology, BME 571 Continuum Mechanics of Solids.

Additional Academic Policies

Students must maintain an overall GPA of 3.00 to remain in good academic standing in the BME Graduate Program.

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined hours of Special Topics and/or Independent Study courses will be applied to the MSBME without appeal to and approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

MSBME Plan I (Thesis Option)

The Plan I Master's degree requires completion of at least 30 semester hours of graduate work.

A Graduate Study Committee consisting of at least three faculty members should be formed. At least one committee member must have a primary appointment within BME and one must have a primary appointment outside of BME. A student is eligible for admission to candidacy after (1) a written thesis proposal has been orally presented to the committee and approved and (2) completion of Responsible Conduct of Research (RCR) training. Admission to candidacy must take place at least one semester before the student may graduate. A written thesis embodying the results of the student's original research must then be publicly defended, approved by the committee, and submitted to the Graduate School.

Upon completing a Plan I MSBME degree, a student may petition to continue their graduate training in the BME PhD program. This does not require a new application to the UAB Graduate School.

Master of Science in Biomedical Engineering

MSBME Plan I (Thesis Option) - 30 hours

Requirements		Hours
BME 617	Engineering Analysis	3
or ME 661	Math Methods in EGR I	
BME 670	Quantitative Physiology	3
BST 621	Statistical Methods I	3
BME Elective 500-697		3
Life Science Elective at the 500+ level		3
BME/EGR/Math/Life Science Elective at the 500+ level [1, 2]		3
BME 601	Seminar in Biomedical Engineering (Must be taken three times)	1
BME 601	Seminar in Biomedical Engineering	1
BME 601	Seminar in Biomedical Engineering [3]	1
BME 698	Non-Thesis Research [4]	3
BME 699	Thesis Research [5]	6
Total Hours		**30**

1 One 3 hour course from another discipline (e.g., MBA) may substitute with approval of the BME Graduate Program Director
2 Students in the Graduate Certificate in Technology Commercialization and Entrepreneurship program are encouraged to choose BMEM 601
3 One hour of BME 697 may substitute for one hour of BME 601
4 An additional 3 hour BME/EGR/Science Elective at the 500+ level may substitute
5 Taken after admission to candidacy

MSBME Plan II (Non-Thesis Option) - 30 hours

The Plan II Master's degree requires completion of at least 30 semester hours of graduate-level work. It also requires completion of a research project and submission of a written project report that must be approved by the student's research advisor and submitted to the BME Graduate Program Director. Submission of the project report to the Graduate School is not required.

Requirements		Hours
BME 617	Engineering Analysis	3
or ME 661	Math Methods in EGR I	
BME 670	Quantitative Physiology	3
BST 621	Statistical Methods I	3
BME Elective 500-697		3
BME/EGR/MA/Life Science Elective at the 500+ level [1, 2]		9
Life Science 500+ level		3
BME 601	Seminar in Biomedical Engineering (Must be taken three times)	1
BME 601	Seminar in Biomedical Engineering	1
BME 601	Seminar in Biomedical Engineering [3]	1
BME 698	Non-Thesis Research [4]	3
Total Hours		**30**

1 One 3 hour course from another discipline (e.g., MBA) may substitute for 3 of these hours with approval of the BME Graduate Program Director
2 Students in the Graduate Certificate in Technology Commercialization and Entrepreneurship program are encouraged to choose BMEM 601
3 One hour of BME 697 may substitute for one hour of BME 601
4 An additional 3 hour BME/EGR/Science Elective at the 500+ level may substitute

PhD Program

Students entering the doctoral program will possess a BS, MS, or be currently enrolled in the DMD/PhD or MD/PhD program at UAB.

PhD students normally have earned a bachelor's degree in Biomedical Engineering, another engineering discipline, or a closely-related field. Students with undergraduate degrees in the physical sciences, life sciences, or mathematics will also be considered for admission; however, such students must demonstrate preparation for the BME graduate curriculum.

Admission to the BME PhD program is competitive. Successful applicants have a 3.5 or greater GPA from their previous degree(s) (on a 4-point scale) and significant research experience. Scores on the GRE General Test are not required but are accepted.

Students admitted to the doctoral program typically receive a competitive stipend that includes payment of tuition.

In addition to completing coursework requirements (see below), doctoral students must form a Graduate Dissertation Committee consisting of at least five faculty members, including the primary research mentor. At least one committee member must have a primary BME appointment and two must have a primary appointment outside of BME. A written dissertation proposal must be orally presented to the committee and approved, at which time the student is admitted to candidacy. This must take place at least two semesters before the student may graduate. A written dissertation embodying the results of the student's original research must then be publicly defended, approved by the committee, and submitted to the Graduate School.

Publication Requirement. Original peer-reviewed research articles in reputable journals are the standard for demonstrating scientific productivity. The research conducted by BME doctoral students is expected to result in such publications. Before the degree is awarded, students are required to have at least one "first-author" journal article that has been published (or accepted for publication) and a second that has been submitted to a journal. Typically, a student's doctoral research will result in at least three first-author articles. Many students will be co-authors on collaborative research articles and may also share authorship on review articles, book chapters, conference proceedings, and other forms of scientific communication. Although these works bolster the student's scientific credentials, they do not count toward the BME publication requirement. In some cases, first-authorship of an article is shared among multiple individuals. In these cases, the article may count toward the publication requirement of only one BME doctoral student.

Additional Academic Policies

Students must maintain an overall GPA of 3.00 to remain in good academic standing in the BME Graduate Program.

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined hours of

Special Topics and/or Independent Study courses will be applied to the PhD without appeal to and approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

Coursework for PhD After BS Degree

Students entering the PhD program with a BS degree are required to complete at least 72 semester hours of graduate work.

Requirements		Hours
BME 717	Engineering Analysis	3
or ME 761	Math Methods in EGR I	
BME 770	Quantitative Physiology	3
BST 621	Statistical Methods I	3
GRD 717	Principles of Scientific Integrity	3
BME 773	Lab Rotation [1]	3
BME Elective 500+ level		6
BME/EGR/Science Elective 500+ level [2, 3]		9
Life Science Elective 500+ level		6
BME 701	Seminar in Biomedical Engineering [4]	6
BME 798	Non-Dissertation Research [5, 6]	6
BME 799	Dissertation Research [6]	24
Total Hours		**72**

1. If the lab rotation is not needed, student should substitute with an elective at the same or higher level with program director approval
2. One 3 hour course from another discipline (e.g., MBA) may substitute for 3 of these hours with approval of the BME Graduate Program Director
3. Students in the Graduate Certificate in Technology Commercialization and Entrepreneurship program are encouraged to choose BMEM 601
4. Up to three hours of BME 797 may substitute for three hours of BME 701
5. BME/EGR/Science Electives at the 500+ level may substitute
6. Up to twelve hours may be substituted with BME 798 hours taken before candidacy; A minimum of twelve hours of BME 799 must be taken after admission to candidacy over at least two terms

Coursework for PhD After MS Degree

Students entering the PhD program with an MS degree or those entering the PhD portion of the DMD/PhD or MD/PhD program are required to complete at least 51 additional semester hours of graduate work.

Requirements		Hours
BME 717	Engineering Analysis	3
or ME 761	Math Methods in EGR I	
BME 770	Quantitative Physiology [1]	3
BST 621	Statistical Methods I [1]	3
GRD 717	Principles of Scientific Integrity [1]	3
BME 773	Lab Rotation [2]	3
BME Elective 500+ level [3]		3
BME Science Elective 500+ level		3
BME 701	Seminar in Biomedical Engineering [4]	3
BME 798	Non-Dissertation Research [5, 6]	3
BME 799	Dissertation Research [5, 6]	24
Total Hours		**51**

1. If these classes were taken as part of an MS degree at UAB, they may be substituted with BME/EGR/Science Electives (500+ level)
2. If the lab rotation is not needed, student should substitute with an elective at the same or higher level with program director approval
3. Students in the Graduate Certificate in Technology Commercialization and Entrepreneurship program are encouraged to choose BMEM 601
4. One hour of BME 797 may substitute for one hour of BME 701
5. BME/EGR/Science Electives at the 500+ level may substitute
6. Up to twelve hours may be substituted with BME 798 hours taken before candidacy; A minimum of twelve hours of BME 799 must be taken after admission to candidacy over at least two terms

Coursework for PhD, Bioinformatics Track after BS Degree

Requirements		Hours
Core Required Courses		
BME 717	Engineering Analysis	3
or ME 761	Math Methods in EGR I	
BME 701	Seminar in Biomedical Engineering [1]	3
BME 770	Quantitative Physiology [2]	3
BME 773	Lab Rotation [3]	3
BST 621	Statistical Methods I [4]	3
GRD 717	Principles of Scientific Integrity	3
BME 799	Dissertation Research [5]	24
Required Bioinformatics Courses		
INFO 701	Introduction to Bioinformatics	3
INFO 702	Algorithms in Bioinformatics	3
INFO 703	Biological Data Management	3
INFO 704	Next-generation Sequencing Data Analysis	3
INFO 791	Bioinformatics Seminar I [6]	3
INFO 793	Bioinformatics Journal Club [7]	6
BME/EGR/Life Science Electives [8]		9
Total Hours		**72**

1. Students will register for BME 701 for at least 3 terms
2. Student may substitute with another GBS genetics or biology elective at the same or higher level with program director approval
3. If the lab rotation is not needed, student should substitute with an elective at the same or higher level with program director approval
4. Student may substitute with another biostatistics course at the same or higher level with program director approval
5. Dissertation research must be conducted after admission to candidacy and over at least 2 terms
6. Students will register for INFO 791 for at least 3 terms
7. Students will register for INFO 793 for at least 3 terms
8. Electives must be approved by the program director prior to registration in order to be applied to the degree

Coursework for PhD, Bioinformatics Track after MS Degree

Requirements		Hours
Core Required Courses		
BME 717	Engineering Analysis	3
or ME 761	Math Methods in EGR I	

BME 701	Seminar in Biomedical Engineering	1
GRD 717	Principles of Scientific Integrity	3
BME 799	Dissertation Research [1]	24
Required Bioinformatics Courses [2]		
INFO 701	Introduction to Bioinformatics	3
INFO 702	Algorithms in Bioinformatics	3
INFO 703	Biological Data Management	3
INFO 704	Next-generation Sequencing Data Analysis	3
INFO 791	Bioinformatics Seminar I [2]	3
INFO 793	Bioinformatics Journal Club	2
BME/Data Science Elective [4]		3
Total Hours		**51**

1. Dissertation research must be conducted after admission to candidacy over at least 2 terms
2. Students with post-graduate equivalence of the INFO courses, the program may allow substitution of up to 6 credits with BME/Data Science electives
3. Students will register for INFO 791 for at least 3 terms
4. Electives must be approved by the program director prior to registration in order to be applied to the degree

Courses

BME 520. Implant-Tissue Interactions. 3 Hours.
An overview of implant biocompatibility including tissue histology, histopathology of implant response and the regulatory process for medical devices.

BME 524. Current Topics in Stem Cell Engineering. 3 Hours.
This course is designed for students interested in the field of stem cells, regenerative medicine, and tissue engineering using stem cells and stem cell derived cells. The course will introduce the role of stem cells in tissue growth and development, the theory behind the design and in vitro construction of tissue and organ replacements, and the applications of biomedical engineering principles to the treatment of tissue-specific diseases. Students will have hands on experience on culturing and analyzing stem cells, stem cell differentiation, analysis of functional and physiological properties of differentiated cells, and fabricating basic engineered-tissues.

BME 535. Tissue Engineering. 3 Hours.
Principles underlying strategies for regenerative medicine such as stem cell based therapy, scaffold design, proteins or genes delivery, roles of extracellular matrix, cell-materials interactions, angiogenesis, tissue transplantation, mechanical stimulus and nanotechnology.

BME 543. Medical Image Processing. 3 Hours.
Fundamental topics of medical image processing to practical applications using conventional computer software.

BME 544. Machine Learning for Biomedical Engineering Applications. 3 Hours.
This course provides the introduction to the practical aspects of machine learning such that the students can apply some basic machine learning techniques in simple biomedical engineering problems. The course also provides the principle of machine learning 'thinking process' for the next machine learning – AI courses and more in-depth machine learning studies. By 'thinking process', at the beginning, it is better to view machine learning like human learning. Students who have experience with Data Mining may further understand the fundamental differences between Machine Learning and Data Mining, although these two fields share many concepts and techniques. Also, the student will learn fundamental theories in machine learning to be able to develop new machine learning techniques and research machine learning in biomedical engineering.

BME 550. Computational Neuroscience. 3 Hours.
This course examines the computational principles used by the nervous system. Topics include: biophysics of axon and synapse, sensory coding (with an emphasis on vision and audition), planning and decision-making, and synthesis of motor responses. There will be an emphasis on a systems approach throughout. Homework includes simulations.

BME 555. NextGen-BioMed Bootcamp: Lab Skills for Biomed Research. 3 Hours.
The course will provide students with a solid foundation in the principles, methods, and techniques used in biomedical research. The course will cover a range of topics, including experimental design, cell and molecular biology techniques, immunological techniques, animal models and in vivo studies, and laboratory safety and good laboratory practices.

BME 561. Bioelectric Phenomena. 3 Hours.
Quantitative methods in the electrophysiology of neural, cardiac and skeletal muscle systems.

BME 562. Cardiac Electrophysiology. 3 Hours.
Experimental and computational methods in cardiac electrophysiology, ionic currents, action potentials, electrical propagation, the electrocardiogram, electromechanical coupling, cardiac arrhythmias, effects of electric fields in cardiac tissue, defibrillation, and ablation.

BME 565. Mechanobiology. 3 Hours.
The overall course objective is to develop understanding of mechanobiological processes in cells as they relate to both development and disease pathways. The course will focus on cancer and vascular biology, however there is significant overlap of these pathways with developmental signaling pathways. Students will learn not only molecular biology techniques for characterizing mechanobiology and cell phenotype but also be able to describe biomechanical analysis protocols including micropipette aspiration, atomic force microscopy, traction force microscopy, and optical/magnetic tweezers. The course will include comprehensive literature reviews relevant to the subject area. Students will present formal presentations on articles discussing mechanobiology topics; students will prepare a written report in the style of a commentary article on a published journal article discussing a relevant mechanobiological project.

BME 571. Continuum Mechanics of Solids. 3 Hours.
Matrix and tensor mathematics, fundamentals of stress, momentum principles, Cauchy and Piola-Kirchoff stress tensors, static equilibrium, invariance, measures of strain, Lagrangian and Eulerian formulations, Green and Almansistrain, deformation gradient tensor, infinitesimal strain, constitutive equations, finite strain elasticity, strain energy methods, 2-D Elasticity, Airy Method, viscoelasticity, mechanical behavior of polymers.

BME 572. Industrial Bioprocessing and Biomanufacturing. 3 Hours.
This course will introduces students to the growing industries related to biomedical, biopharmaceutical and biotechnology. It is targeted to offer the students marketable skills to work in a vital area of economic growth and also convey some of the challenges and opportunities awaiting.

BME 590. Special Topic in Biomedical Engineering. 1-3 Hour.
Special Topic in Biomedical Engineering.

BME 591. Individual Study in Biomedical Engineering. 1-6 Hour.
Individual Study in Biomedical Engineering.

BME 601. Seminar in Biomedical Engineering. 1 Hour.
Current topics in biomedical engineering technology and applications.

BME 605. Insights to Innovations BME Journal Club. 1 Hour.
Insights to Innovations (i2i) BME Scholar's Pulse is a Journal Club designed to facilitate critical analyses and discussion of current research in the field of biomedical engineering. Students will learn how to conduct literature searches, read and evaluate scientific articles, and present research findings effectively. Students will develop their presentation and discussion skills and gain a deeper understanding of the various subfields of biomedical engineering.

BME 617. Engineering Analysis. 3 Hours.
Advanced ordinary differential equations, transform techniques, scalar and vector field theory, partial differential equations (heat, wave, Laplace). Students who register for this course are expected to have successfully completed courses in calculus and ordinary differential equations.

BME 623. Skin and Bone Regeneration. 3 Hours.
Study of principles of healing, methods to enhance, and clinical applications.

BME 625. Immune-Engineering: Biomaterial Toolbox for Immune-Modulation. 3 Hours.
This course introduces immunology and engineering approaches to study and control immune response using biomaterials. The course is geared towards students/engineers without a deeply established background in immunology. Basic principles in immunology will be covered and contemporary research directions will be discussed based on articles from the primary literature. Biomaterials will be presented as a tool for modifying immune responses.

BME 634. Dynamical Biological Systems. 3 Hours.
This course considers the dynamics of biological systems at a variety of levels from the cell/molecular to the circuit and system levels. Biological systems are typically nonlinear and their behavior is not usually analytically solvable. Yet it is possible to use the tools of nonlinear dynamical systems theory to approach understanding. In addition, it is important to understand how robust control theory can be applied to describe systems for which an exact mathematical model does not exist. The goal of this course is to examine a number of examples in some detail to gain insight into the dynamics of regulation in biology.

BME 643. Biomedical Imaging-Oncology. 3 Hours.
Advanced and quantitative medical imaging and image processing to understand biological processes related to cancer biology. Medical imaging technology will include molecular, functional and anatomical imaging related to the hallmarks of cancer.

BME 664. Neural Computation. 3 Hours.
This course examines the principal theoretical underpinnings of computation in neural networks. Emphasis will be placed on understanding the relationship between the different approaches: dynamical systems, statistical mechanics, logic, Kalman filters, and likelihood/Bayesian estimation.

BME 665. Computational Vision. 3 Hours.
This course approaches the study of biological and artificial vision from a theoretical perspective beginning with a comparative survey of visual systems and then examining vision algorithms and architectures.

BME 670. Quantitative Physiology. 3 Hours.
Study of physiological problems using advanced mathematical techniques. Topics covered include: mechanics, fluid dynamics, transport, electrophysiology of cell membranes, and control systems.
Prerequisites: BME 517 [Min Grade: C] or BME 617 [Min Grade: C] or BME 717 [Min Grade: C] or ME 661 [Min Grade: C] or ME 761 [Min Grade: C]

BME 672. Cellular Therapy. 3 Hours.
Introduction to research in cellular therapy, its clinical applications, and its potential for commercialization. Students will learn fundamental mechanisms, become familiar with the progress of several successful therapies that use human T cells and stem cells, and learn the challenges and opportunities for future biopharmaceutical and biotechnology industries.

BME 673. Lab Rotation. 3 Hours.
Entering BME graduate students will work in the laboratories of 2 or 3 potential research mentors. The duration of each rotation period will be by mutual agreement between student and faculty but must be at least 4 weeks. The goal is for students to match with their primary research mentor by the end of the course.

BME 680. Biomolecular Modeling. 3 Hours.
Molecular modeling principles and applications. Students will perform hands-on exercises using molecular modeling tools and software. Students will learn the critical relationships among structure, function, and thermodynamic driving forces in structural biology and become able to utilize molecular modeling techniques to explore biological phenomena at the molecular level.

BME 690. Special Topics in Biomedical Engineering. 1-6 Hour.
Special Topics in Biomedical Engineering.

BME 691. Individual Study in Biomedical Engineering. 1-6 Hour.
Individual Study in Biomedical Engineering.

BME 693. Internship in Biomedical Engineering. 1-6 Hour.

BME 697. Journal Club. 1-3 Hour.
Journal Club.

BME 698. Non-Thesis Research. 1-12 Hour.

BME 699. Thesis Research. 1-12 Hour.
Prerequisites: GAC M

BME 701. Seminar in Biomedical Engineering. 1 Hour.
Current topics in biomedical engineering technology and applications.

BME 705. Insights to Innovation BME Journal Club. 1 Hour.
Insights to Innovations (i2i) BME Scholar's Pulse is a Journal Club designed to facilitate critical analyses and discussion of current research in the field of biomedical engineering. Students will learn how to conduct literature searches, read and evaluate scientific articles, and present research findings effectively. Students will develop their presentation and discussion skills and gain a deeper understanding of the various subfields of biomedical engineering.

BME 717. Engineering Analysis. 3 Hours.
Advanced ordinary differential equations, transform techniques, scalar and vector field theory, partial differential equations (heat, wave, Laplace).

BME 723. Skin and Bone Regeneration. 3 Hours.
Study of principles of healing, methods to enhance, and clinical applications.

BME 725. Immune-Engineering: Biomaterial Toolbox for Immune-Modulation. 3 Hours.
This course introduces immunology and engineering approaches to study and control immune response using biomaterials. The course is geared towards students/engineers without a deeply established background in immunology. Basic principles in immunology will be covered and contemporary research directions will be discussed based on articles from the primary literature. Biomaterials will be presented as a tool for modifying immune responses.

BME 734. Dynamical Biological Systems. 3 Hours.
This course considers the dynamics of biological systems at a variety of levels from the cell/molecular to the circuit and system levels. Biological systems are typically nonlinear and their behavior is not usually analytically solvable. Yet it is possible to use the tools of nonlinear dynamical systems theory to approach understanding. In addition, it is important to understand how robust control theory can be applied to describe systems for which an exact mathematical model does not exist. The goal of this course is to examine a number of examples in some detail to gain insight into the dynamics of regulation in biology.

BME 743. Biomedical Imaging-Oncology. 3 Hours.
Advanced and quantitative medical imaging and image processing to understand biological processes related to cancer biology. Medical imaging technology will include molecular, functional and anatomical imaging related to the hallmarks of cancer.

BME 764. Neural Computation. 3 Hours.
This course examines the principal theoretical underpinnings of computation in neural networks. Emphasis will be placed on understanding the relationship between the different approaches: dynamical systems, statistical mechanics, logic, Kalman filters, and likelihood/Bayesian estimation.

BME 765. Computational Vision. 3 Hours.
This course approaches the study of biological and artificial vision from a theoretical perspective. We begin with a comparative survey of visual systems, and will examine vision algorithms and architectures.

BME 770. Quantitative Physiology. 3 Hours.
Study of physiological problems using advanced mathematical techniques. Topics covered include: mechanics, fluid dynamics, transport, electrophysiology of cell membranes, and control systems.
Prerequisites: BME 517 [Min Grade: C] or BME 617 [Min Grade: C] or BME 717 [Min Grade: C] or ME 661 [Min Grade: C] or ME 761 [Min Grade: C]

BME 772. Cellular Therapy. 3 Hours.
Introduction to research in cellular therapy, its clinical applications, and its potential for commercialization. Students will learn fundamental mechanisms, become familiar with the progress of several successful therapies that use human T cells and stem cells, and learn the challenges and opportunities for future biopharmaceutical and biotechnology industries.

BME 773. Lab Rotation. 3 Hours.
Entering BME graduate students will work in the laboratories of 2 or 3 potential research mentors. The duration of each rotation period will be by mutual agreement between student and faculty, but must be at least 4 weeks. The goal is for students to match with their primary research mentor by the end of the course.

BME 780. Biomolecular Modeling. 3 Hours.
Molecular modeling principles and applications. Students will perform hands-on exercises using molecular modeling tools and software. Students will learn the critical relationships among structure, function, and thermodynamic driving forces in structural biology and become able to utilize molecular modeling techniques to explore biological phenomena at the molecular level.

BME 790. Special Topics in Biomedical Engineering. 1-6 Hour.
Special Topics in Biomedical Engineering.

BME 791. Individual Study in Biomedical Engineering. 1-6 Hour.
Individual Study in Biomedical Engineering.

BME 793. Internship in Biomedical Engineering. 1-6 Hour.

BME 797. Journal Club. 1-3 Hour.
Journal Club.

BME 798. Non-Dissertation Research. 1-12 Hour.

BME 799. Dissertation Research. 1-12 Hour.
Prerequisites: GAC Z

Civil Engineering

The Department of Civil, Construction, and Environmental Engineering (CCEE) offers master's and doctoral level programs as well as graduate certificates. Graduate students are exposed to cutting-edge research covering various facets of civil engineering theory and practice. Knowledgeable and experienced faculty members work closely with students to provide them with the tools required to succeed professionally in globally competitive work environments.

Program	Coordinator	Room	Phone Number
Certificates	Nasim Uddin, PhD	Hoehn Engineering Building, Room 321	(205) 934-8432; nuddin@uab.edu

Category A certificates are offered by the Department of Civil, Construction, and Environmental Engineering. Any undergraduate or graduate student in good standing who is pursuing a Civil Engineering degree (BSCE, MSCE, or PhD) may elect to simultaneously complete the requirements of his or her degree program and the Certificate Program. These certificates are listed on student transcripts and in the university graduation bulletin.

Certificates can be earned in:

- Construction Engineering Management
- Environmental Engineering
- Geotechnical Engineering
- Structural Engineering
- Sustainable Engineering
- Transportation Engineering

Civil Engineering (BSCE) graduates who complete the Certificate Program will have greater depth in a specific technical area. The certificates also allow a means for practicing engineers to acquire expertise beyond a Bachelor's degree, and have it formally recognized without completing a program leading to a Master's degree. This technical expertise will enhance their proficiency and marketability. Up to 12 graduate level credit hours taken for a certificate may be applied toward the MSCE degree.

The requirements are as follows:

- Students must be admitted to the Department as either undergraduate (BSCE) or graduate (MSCE) students in Civil, Construction, and Environmental Engineering or hold a BS in Civil Engineering or a closely related field from an accredited institution.
- Certificates require a minimum of 15 credit hours consisting of five graduate level elective courses in the area of specialization. Certificates for undergraduate students will be awarded upon completion of the BSCE degree.
- Graduate level elective courses taken may be applied to the certificate as well as a MSCE degree.
- One course, up to three credit hours, may be transferred from another institution.
- Courses taken from University of Alabama, University of South Alabama, and University of Alabama in Huntsville via Intercampus Interactive Telecommunications System (IITS) may be applied to certificates with prior approval of the certificate program director.
- Elective course may be taken at the 500, 600, or 700 level. Special topics courses (CE 590, CE 690, CE 790) may be applied to certificates with prior approval of the certificate program director.

Certificate in Construction Engineering Management

Requirements		Hours
Prerequisite Course		
CE 497	Construction Engineering Management (or equivalent)	
Select 15 credits from the following:		**15**
CE 575	Construction Safety and Health Management	
CE 600	Sustainable Construction	
CECM 669	Advanced Project Management	
CECM 670	Construction Estimating and Bidding	
CECM 671	Construction Liability & Contracts	
CECM 672	Construction Methods and Equipment	
CECM 673	Project Planning and Control	
CECM 674	Green Building Design/Construction	
CECM 675	Advanced Construction and Engineering Economics	
CECM 676	Construction Project Risk Management	
CECM 688	Construction Management and Leadership Challenges in the Global Environment	
CECM 689	Building Information Modeling (BIM) Techniques	

Certificate in Environmental Engineering

Requirements		Hours
Prerequisite Courses		
CE 236	Environmental Engineering (or equivalent)	
CE 337	Hydraulics (or equivalent)	
Select 15 credits from the following:		**15**
CE 530	Water Supply/Drainage Design	
CE 533	Solid and Hazardous Wastes Management	
CE 534	Air Quality Modeling and Monitoring	
CE 580	Introduction to Water and Wastewater Treatment	
CE 608	Green Building Design	
CE 640	Wastewater Treatment Engineering	
CE 685	Engineering Hydrology	
CESC 600	Principles of Sustainable Development	
CESC 602	Introduction to Sustainable Smart Cities	

Certificate in Geotechnical Engineering

Requirements		Hours
Prerequisite Course		
CE 332	Soil Engineering (or equivalent)	
CE 332L	Soil Engineering Laboratory (or equivalent)	
Select 15 credits from the following:		**15**
CE 516	Mechanical Vibrations	
CE 520	Advanced Mechanics	
CE 526	Foundation Engineering	
CE 560	Structural Mechanics	
CE 562	Advanced Structural Analysis	
CE 567	Wind and Seismic Loads	
CE 690	Special Topics in (Area) [1]	
CECM 669	Advanced Project Management	
CECM 671	Construction Liability & Contracts	

[1] Must be approved by certificate program director prior to registration

Certificate in Structural Engineering

Requirements		Hours
Prerequisite Course		
CE 360	Structural Analysis (or equivalent)	
Select 15 credits from the following:		**15**
CE 516	Mechanical Vibrations	
CE 520	Advanced Mechanics	
CE 526	Foundation Engineering	
CE 553	Design of Wood Structures	
CE 556	Prestressed Concrete Design	
CE 561	Introduction to the Finite Element Method	
CE 562	Advanced Structural Analysis	
CE 564	Structural Dynamics	
CE 567	Wind and Seismic Loads	
CE 568	Bridge Engineering	
CE 650	Advanced Structural Steel	
CE 655	Advanced Reinforced Concrete	
CESE 653	Wood and Masonry Design	
CESE 656	Advanced Mechanics of Materials for Structural Engineering	
CESE 659	Advanced Reinforced Concrete	
CESE 660	Prestressed Concrete Behavior and Design	
CESE 662	Advanced Structural Analysis	
CESE 664	Bridge Engineering	
CESE 665	Structural Dynamics and Earthquake Engineering	
CESE 676	Design of Structural Steel Connections	
CESC 602	Introduction to Sustainable Smart Cities [1]	
CESC 608	Green Infrastructure and Transportation [1]	
CESC 614	Smart Cities Technologies [1]	

[1] Only one of these courses can be applied to this certificate

Certificate in Sustainable Engineering Management

Requirements		Hours
Prerequisite Course		
CE 497	Construction Engineering Management (or equivalent)	
Select 15 credits from the following:		**15**
CE 600	Sustainable Construction	
CE 608	Green Building Design	
CESC 600	Principles of Sustainable Development	
CESC 602	Introduction to Sustainable Smart Cities	
CESC 608	Green Infrastructure and Transportation	
CESC 610	Health and Livability	
CESC 614	Smart Cities Technologies	
CESC 616	Big Data and Smart Cities	

Certificate in Transportation Engineering

Requirements		Hours
Prerequisite Course		
CE 345	Transportation Engineering (or equivalent)	
Select 15 credits from the following:		**15**
CE 543	Pavement Design & Construction	
CE 622	Traffic Flow Theory	
CE 623	Non-Motorized Transportation Design and Planning	
CE 624	Simulation Models for Transportation Applications	
CE 625	Intelligent Transportation Systems	
CE 646	Traffic Engineering Operations	
CE 648	Urban and Transportation Planning	
CE 690	Special Topics in (Area) [1]	
CECM 669	Advanced Project Management [2]	
CECM 671	Construction Liability & Contracts [2]	
CESC 600	Principles of Sustainable Development [2]	
CESC 602	Introduction to Sustainable Smart Cities [2]	
CESC 608	Green Infrastructure and Transportation [2]	

[1] Must be approved by certificate program director prior to registration
[2] Only one of these courses can be applied to this certificate

The following three concentrations in the online Master in Engineering program are offered through the Department of Civil, Construction, and Environmental Engineering:

- Construction Engineering Management
- Sustainable Smart Cities

Construction Engineering Management Concentration

Please Note: All Master of Engineering concentrations are 100% online. There are no on-campus classes or required on-campus meetings or activities. Course delivery includes asynchronous and synchronous learning modes. Proper computer equipment and high-speed internet direct access are required to be successful.

Degree Offered	Master of Engineering
Website	http://www.uab.edu/engineering/cem
Director	Wesley Zech, PhD, LEED AP
Email	zechwes@uab.edu
Director of CEM Student Affairs	Dianne Gilmer, MEng, PMP
Email	digilmer@uab.edu
Phone	205-975-5848
Address	UAB School of Engineering, HOEN 130B
	1720 2nd Avenue South, Birmingham, AL 35294-4440

The Master of Engineering with a concentration in Construction Engineering Management (MEng-CEM) is designed to enhance the construction engineering management and business qualifications of working professionals interested in project and company/corporate management.

Admission Requirements

In addition to the Graduate School admission requirements, admission to the UAB MEng-CEM includes the following:

1. **Bachelor's degree** (any discipline) from a regionally accredited US college or university. CEM promotes a multi-discipline learning experience and therefore an engineering undergraduate degree is not required;
2. An **undergraduate GPA** of 3.0 or higher (individuals not meeting this requirement but who have a strong professional background, references, and interview may be admitted);
3. **No GRE required**;
4. International applicants must submit **English proficiency scores** in accordance with UAB Graduate School requirement. Click here for details;
5. **Original transcripts** sent directly to the UAB Graduate School per their policy for degree-seeking students (detailed instructions are included during the online application process);
6. Two years of **relevant construction industry work experience** or a bachelor's degree in engineering or a science-related field;
7. **Personal interview** with the Director of CEM Student Affairs (schedule the interview prior to submitting a application);
8. Three **letters of recommendation** from professional contacts;
9. **Personal essay** detailing motivation and career aspirations for earning the degree; and
10. **Résumé/Curriculum Vitae**

To apply: Visit the UAB Graduate School website and click the ‘Apply Now’ button. Choose MEng - Construction Engineering Management in the *Program Applying To* section.

Deadline for Entry Term(s)	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office	Seven business days before term begins (see https://www.uab.edu/students/academics/academic-calendar)

Curriculum Requirements

Requirements		Hours
CECM 669	Advanced Project Management	3
CECM 670	Construction Estimating and Bidding	3

CECM 671	Construction Liability & Contracts	3
CECM 672	Construction Methods and Equipment	3
CECM 673	Project Planning and Control	3
CECM 674	Green Building Design/Construction	3
CECM 675	Advanced Construction and Engineering Economics	3
CECM 676	Construction Project Risk Management	3
CECM 688	Construction Management and Leadership Challenges in the Global Environment	3
CECM 689	Building Information Modeling (BIM) Techniques	3
Total Hours		**30**

Sustainable Smart Cities Concentration

Please Note: All Master of Engineering concentrations are 100% online. There are no on-campus classes or required on-campus meetings or activities. Course delivery includes asynchronous and synchronous learning modes. Proper computer equipment and high-speed internet direct access are required to be successful.

Degree Offered	Master of Engineering
Website	http://www.uab.edu/engineering/smartcities
Director	Jason T. Kirby, PhD
E-mail	jtkirby@uab.edu
Phone	205-934-8479
Address	UAB School of Engineering, HOEN 340 1720 2nd Avenue South, Birmingham, AL 35294-4440

Admission Requirements

In addition to the Graduate School admission requirements, requirements for admission to the UAB MEng-SSC program includes the following:

- Bachelor's degree (any discipline) from a regionally accredited US college or university. SSC promotes a multi-discipline learning experience and therefore an engineering undergraduate degree is not required;
- An undergraduate GPA of 3.0 or higher (individuals not meeting this requirement but who have a strong professional background, references, and interview may be admitted);
- No GRE required
- International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details;
- Original transcripts sent directly to the UAB Graduate School per their policy for degree-seeking students (detailed instructions are included during the online application process);
- Personal interview with the Director of SSC (schedule the interview prior to submitting a application);
- Three letters of recommendation from professional contacts;
- Personal essay detailing academic motivation and career aspirations in SSC; and
- Résumé/Curriculum Vitae

Application Submission Deadline for Entry Term(s)	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office	Seven business days before term begins (see UAB academic calendar - https://www.uab.edu/students/academics/academic-calendar)

Requirements		Hours
CESC 600	Principles of Sustainable Development	3
CESC 602	Introduction to Sustainable Smart Cities	3
CESC 604	Low-Carbon and Renewable Energy Systems for Smart Cities	3
CESC 606	Managing Natural Resources and Sustainable Smart Cities	3
CESC 608	Green Infrastructure and Transportation	3
CESC 610	Health and Livability	3
CESC 612	Green Buildings	3
CESC 614	Smart Cities Technologies	3
CESC 616	Big Data and Smart Cities	3
CESC 618	Research Methods and Project Planning	3
Total Hours		**30**

Curriculum

Requirements	Hours
Students must complete a minimum of 30 hours with the classes listed below	**30**
All CESE courses at the 600 level	
All CECM courses with advisor-approval 600-791 (maximum of 9 hours)	
All CE courses with advisor-approval 500-791 (maximum of 12 hours)	
Total Hours	**30**

Admission Requirements

In addition to the UAB Graduate School admission requirements, admission to the Master's of Science in Civil Engineering degree include the following five criteria:

1. An undergraduate engineering degree from an ABET accredited engineering program or applied science program. Applicants who have an outstanding academic record in an unaccredited engineering or applied science degree program may be admitted at program discretion. Students admitted from this category may be required to complete a sequence of undergraduate courses in addition to the normal requirements of the MSCE degree. This set of extra requirements will be specified in writing at the time of admission to the program.
2. GPA of 3.0 or better on a 4.0 scale in all undergraduate degree major courses attempted;
3. Three letters of recommendation concerning the applicant's previous academic and professional work;
4. Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School (detailed instructions are included during the online application process)
5. International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details
6. Verification of registration by examination as a Professional Engineer (PE) will satisfy criteria 4 above.

Program Requirements

The following minimum requirements apply to the plan of study for a student who has earned a baccalaureate degree in civil engineering. A student with an undergraduate degree in another field may also be accepted into the civil engineering program but will normally have to take additional preparatory coursework as part of an expanded plan of study. Continuous enrollment for at least 3 credit hours per term is required. Students receiving a research assistantship are required to be enrolled as full-time students. A full-time student is one who is enrolled in at least 9 credit hours per semester.

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined credit hours of Special Topics and/or Independent Study courses will be applied to the MSCE degree without appeal to and approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-elevel course for credit if they have previously taken the related 400-level or 600 level course, respectively.

Master of Science in Civil Engineering

Plan I (Thesis Option)

When a Plan I student successfully completes required coursework, the student should apply to enter candidacy. Once a master's candidate, the student must complete a minimum of 9 credit hours of thesis research (CE 699) over the course of at least two semesters. Prior to admission of candidacy, the student can take research credit hours in the form of non-thesis research (CE 698). These non-thesis research credit hours cannot be converted from non-thesis research credits into thesis research credits.

1. The student must successfully complete at least 22 credit hours of graduate credit, including:
   a. A minimum of 18 credit hours in civil engineering;
   b. Up to 6 credit hours in disciplines outside civil engineering, such as other engineering disciplines, mathematics, chemistry, computer science, earth science, physics, urban affairs, public administration, or public health; and
   c. A minimum of 9 credit hours of CE 699 Thesis Research under the direction of the graduate study committee chair resulting in a successful oral defense and committee approved thesis.
2. All Plan I Master's students are required to complete online modules covering the 9 topic areas of Responsible Conduct of Research (RCR) research integrity. The modules can be accessed online at **https://www.citiprogram.org.**

Plan II (Non-Thesis Option):

The student must successfully complete at least 33 credit hours of graduate credit including:

1. A minimum of 24 credit hours in civil engineering;
2. Up to 6 credit hours in disciplines outside civil engineering, such as other engineering disciplines, mathematics, chemistry, computer science, earth science, physics, urban affairs, public administration, or public health; and
3. A minimum of 3 credit hours of CE 698 Non-Thesis Research under the direction of the graduate study committee chair resulting in a successful oral defense and committee approved written report.

Areas of Specialization

The department offers specialization programs in the fields of construction engineering management, environmental engineering, structural engineering/structural mechanics, and transportation engineering. Supporting courses are offered in geotechnical engineering, optimization, engineering law, and other areas. If a student chooses to declare a concentration, the student must choose from the courses listed below the appropriate concentration to fulfill the required 18 credit hours (Plan I) or 24 credit hours (Plan II) within civil engineering.

Concentration in Construction Engineering Management

Requirements		Hours
Select 18 credits hours for Plan I or 24 credit hours for Plan II from the following: [1]		
CE 515	Building Information Modeling (BIM) [1]	
CE 575	Construction Safety and Health Management	
CE 597	Construction Engineering Management	
CE 600	Sustainable Construction	
CE 690	Special Topics in (Area) [2]	
CE 691	Individual Study in (Area) [2]	
CECM 669	Advanced Project Management [3]	
CECM 670	Construction Estimating and Bidding [3]	
CECM 671	Construction Liability & Contracts [3]	
CECM 672	Construction Methods and Equipment [3]	
CECM 673	Project Planning and Control [3]	
CECM 674	Green Building Design/Construction [3]	
CECM 675	Advanced Construction and Engineering Economics [3]	
CECM 676	Construction Project Risk Management [3]	
CECM 688	Construction Management and Leadership Challenges in the Global Environment [3]	
CECM 689	Building Information Modeling (BIM) Techniques [1, 3]	

1 Only one of these courses can be applied to this degree

2 or any CE 590/690 IITS course offerings from UA, USA, or UAH campuses with prior approval of the Program Director. Please note: all special topics and individual study courses must have prior approval of the program director in order to apply to degree or concentration requirements; no more than a combined 6 hours of special topics or individual study can be applied to the degree without prior program director approval

3 MEng courses (i.e., CECM, CESE, and CESC) can be applied toward MSCE degree requirements

Concentration in Environmental Engineering

Requirements		Hours
Select 18 credit hours for Plan I or 24 credit hours for Plan II from the following:		
CE 530	Water Supply/Drainage Design	
CE 531	Energy Resources	
CE 533	Solid and Hazardous Wastes Management	
CE 534	Air Quality Modeling and Monitoring	
CE 537	Environmental Experimental Design and Field Sampling	

CE 580	Introduction to Water and Wastewater Treatment
CE 585	Engineering Hydrology
CE 590	Special Topics in Civil Engineering [2]
CE 600	Sustainable Construction [1]
CE 608	Green Building Design
CE 610	The Engineered Environment
CE 636	Stormwater Pollution Management
CE 640	Wastewater Treatment Engineering
CE 690	Special Topics in (Area) [2]
CE 691	Individual Study in (Area) [1]
CESC 600	Principles of Sustainable Development
CESC 602	Introduction to Sustainable Smart Cities [2, 3]
CESC 608	Green Infrastructure and Transportation [2, 3]

1 or any CE 590/690 IITS course offerings from UA, USA, or UAH campuses with prior approval of the Program Director. Please note: all special topics and individual study courses must have prior approval of the program director in order to apply to degree or concentration requirements; no more than a combined 6 hours of special topics or individual study can be applied to the degree without prior program director approval

2 MEng courses (i.e., CECM, CESC, CESE) can be applied to the MSCE degree requirements

3 Only one of these courses can be applied to this degree

Concentration in Structural Engineering

Requirements		Hours
Select 18 credit hours for Plan I or 24 credit hours for Plan II from the following:		
CE 516	Mechanical Vibrations	
CE 520	Advanced Mechanics	
CE 526	Foundation Engineering	
CE 544	Civil Engineering Analysis II	
CE 553	Design of Wood Structures	
CE 554	Design of Masonry Structures	
CE 556	Prestressed Concrete Design	
CE 557	Concrete Technology	
CE 560	Structural Mechanics	
CE 561	Introduction to the Finite Element Method	
CE 562	Advanced Structural Analysis	
CE 564	Structural Dynamics	
CE 568	Bridge Engineering	
CE 590	Special Topics in Civil Engineering [2]	
CE 612	Theory of Elasticity [1]	
CE 617	Theory of Plates and Shells	
CE 650	Advanced Structural Steel	
CE 655	Advanced Reinforced Concrete	
CE 690	Special Topics in (Area) [2]	
CE 691	Individual Study in (Area) [1]	
CESC 602	Introduction to Sustainable Smart Cities [3]	
CESC 608	Green Infrastructure and Transportation [2]	
CESC 614	Smart Cities Technologies [2]	

1 or any CE 590/690 IITS course offerings from UA, USA, or UAH campuses with prior approval of the Program Director. Please note: all special topics and individual study courses must have prior approval of the program director in order to apply to degree or concentration requirements; no more than a combined 6 hours of special topics or individual study can be applied to the degree without prior program director approval

2 MEng courses (i.e., CECM, CESC, CESE) can be applied to MSCE degree requirements

Concentration in Transportation Engineering

Requirements		Hours
Select 18 credit hours for Plan I or 24 credit hours for Plan II from the following: [1]		
CE 543	**Pavement Design & Construction (Select 18 credit hours for Plan I or 24 credit hours for Plan II from the following:)**	**3**
CE 590	Special Topics in Civil Engineering [2]	
CE 621	Transportation Engineering Seminar [1]	
CE 622	Traffic Flow Theory	
CE 624	Simulation Models for Transportation Applications	
CE 625	Intelligent Transportation Systems	
CE 646	Traffic Engineering Operations	
CE 648	Urban and Transportation Planning	
CE 690	Special Topics in (Area) [2]	
CE 691	Individual Study in (Area) [1]	

1 or any CE 590/690 IITS course offerings from UA, USA, or UAH campuses with prior approval of the Program Director. Please note: all special topics and individual study courses must have prior approval of the program director in order to apply to degree or concentration requirements; no more than a combined 6 hours of special topics or individual study can be applied to the degree without prior program director approval

The Department offers a variety of courses due to the focus areas under the Master of Science in Civil Engineering, which makes it difficult to designate all the courses in which students may enroll. Therefore, the lists above are not all-inclusive.

Admission Requirements

The coordinated Environmental Engineering/Public Health degree program is offered through the UAB School of Engineering (SOE) and UAB School of Public Health (SOPH). Earning these two advanced degrees prepares students for a broad range of careers in urban planning, urban sustainability, healthy and livable city design, the management of air, water, and land resources, and creating healthy communities. Students in this coordinated program earn a Master of Public Health (M.P.H.) with a concentration in Population Health. In this concentration, students gain a solid foundation in public health through completion of the M.P.H. core (based on the Evidence-based Public Health framework), an Applied Practice Experience (Internship), and an Integrative Learning Experience (Capstone). Students also complete environmental health sciences courses focusing on urban health issues including air and water pollution, occupational safety, and assessing and managing environmental risks. In addition, in this coordinated degree program students earn a Master of Science in Civil Engineering (MSCE) with a specialization in environmental engineering focusing green building and water supply design, drainage and stormwater runoff design, and energy resources. The program offers a broad curriculum covering health aspects of engineering designs, resilient and sustainable urban development, low carbon and renewable energy systems, green infrastructure, natural resource management, health and livability, transportation and mobility, big data analytics, and

smart technologies. Graduates of this coordinated degree program will shape our modern cities into human habitats that are safe, clean, and sustainable addressing issues such as the growing stressors of energy security, population growth and health, food supply, waste disposal, climate change, and future infrastructure demands. This program is aimed at leaders and professionals in public and private sector organizations who seek to design, develop, and deliver smart, healthy and sustainable environmental solutions.

In addition to the UAB Graduate School admission requirements, admission to the dual Master's of Science in Civil Engineering (MSCE)/ Master's of Public Health (MPH) degree include the following five criteria:

1. An undergraduate engineering degree from an ABET accredited engineering program, applied science program, or similar. Applicants who have a degree from an unaccredited program but demonstrate an outstanding academic record may be admitted provisionally at the CCEE Graduate Program Director's discretion. Students admitted from this category may be required to complete a sequence of undergraduate courses in addition to the regular requirements of the MSCE degree. This set of extra requirements will be specified in writing at the time of admission to the program.
2. An undergraduate GPA of 3.0 or higher on a 4.0 scale in all undergraduate degree major courses attempted. Individuals not meeting this requirement but who have a strong professional background and excellent references may be admitted.
3. Three (3) letters of recommendation concerning the applicant's previous academic and professional work.
4. **No GRE required**.
5. International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details.
6. Verification of registration by examination as a Professional Engineer (PE) will satisfy criterion 2 above.

Master of Science in Civil Engineering/Master of Public Health Program Requirements

The following minimum requirements apply to the plan of study for a student who has earned a baccalaureate degree in civil engineering (BSCE). The MSCE/MPH degree plan contains 42-44 MPH credit hours meeting the Council on Education for Public Health (CEPH) MPH requirements and include PUH 610 Population Health meeting the SOPH requirement for the MPH in Population Health. 2) The MSCE/MPH degree plan contains 33 MSCE credit hours meeting the SOE MSCE requirements and have at least 30 credit hours unique to each Master's degree satisfying the UAB Graduate School requirements.

A student with an undergraduate degree in another field may also be accepted into the civil engineering program but will normally have to take additional preparatory coursework as part of an expanded plan of study. Continuous enrollment for at least 3 credit hours per semester is required. Students receiving a research assistantship are required to be enrolled as full-time students. A full-time student is one who is enrolled in at least 9 credit hours per semester.

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined credit hours of Special Topics and/or Independent Study courses will be applied to the MSCE degree without appeal to and approval from the Program Director.

The SOE offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-elevel course for credit if they have previously taken the related 400-level or 600 level course, respectively.

When the graduate student successfully completes required coursework, the student opted for Plan I (Thesis Option) should apply to enter candidacy. Once a master's candidate, the student must complete a minimum of 9 credit hours of thesis research (CE 699) over the course of at least two semesters. Prior to admission of candidacy, the student can take research credit hours in the form of non-thesis research credit hours (CE 698). These non-thesis research credit hours cannot be converted from non-thesis research credits into thesis research credits.

MSCE/MPH Curriculum

Requirements		Hours
MPH Core Requirements		14
PUH 601	This is Public Health	
PUH 602	Community Assessment	
PUH 603	Quantitative Methods in Public Health	
PUH 604	Programs and Policies	
PUH 605	Public Health Management and Evaluation	
PUH 606	Leadership for Evidence-Based Public Health	
MPH Degree Requirement		1
ENH 690	Environmental Health Perspectives	
Population Health Requirement		3
PUH 610	Population Health	
Environmental Health Sciences Recommended Courses [1]		7
ENH 600	Fundamentals of Environmental Health Science	
ENH 612	Assessing & Managing Environmental Risks	
ENH 660	Fundamentals of Air and Water Pollution	
MPH Applied Practice Experience		3
PUH 688	Public Health Internship	
MPH Integrative Learning Experience		2
ENH 689	Environmental Health Sciences Integrative Learning Experience	
Total Hours Earned for MPH Degree: 30 [3]		
MPH Shared Hours from MSCE Curriculum [4]		18
CE 580	Introduction to Water and Wastewater Treatment	
CE 585	Engineering Hydrology	
CE 530	Water Supply/Drainage Design	
CE 608	Green Building Design	
Total Hours Earned for MPH Degree [3]		
Remaining MSCE Program Requirements		18
CE 531	Energy Resources	
CE 537	Environmental Experimental Design and Field Sampling	
CE 731	Environmental Law	
CE 699	Thesis Research [5, 6]	
Total Unique MSCE Hours: 30 [2]		
MSCE Shared Hours from MPH Curriculum		
ENH 612	Assessing & Managing Environmental Risks	
Total Hours Earned for MSCE Degree [7]		
Total Hours Completed for MSCE/MPH Degree [8]		

[1] Students may substitute ENH courses to meet their educational objectives with consent of advisor (7 credit hours minimum required)

[2] Meets UAB Graduate School requirements of a minimum 30 hours of graduate work
[3] Meets the CEPH MPH requirements of a minimum of 42 semester hours
[4] Course substitutions may be made with consent of advisor
[5] EHS faculty will serve on thesis committee
[6] For Thesis students; Non-Thesis students will register for a total of 6 credit hours of CE electives and 3 credit hours of CE 698 Non-Thesis Research
[7] Master of Science in Engineering
[8] Assumes the recommended Environmental Health Sciences courses plus PUH 610 Population Health (12 credit hours)

Admission Requirements

In addition to the UAB Graduate School admission requirements, requirements for admission to the program leading to the Doctorate of Philosophy in Civil Engineering degree include the following five criteria:

1. An **undergraduate engineering degree** from an ABET accredited program **or a master's degree in engineering**. Applicants who do not meet this criterion but who have an outstanding academic record in an engineering degree program not accredited by ABET, or in a baccalaureate or master's degree program in a related field, may be admitted on probation. Students admitted in this category will be required to complete a sequence of undergraduate or graduate courses in addition to the regular requirements of the MSCE degree. This set of extra requirements will be specified in writing at the time of admission to the program;
2. An **undergraduate GPA** of 3.0 or higher on a scale of 4.0 in all undergraduate degree major courses attempted. Individuals not meeting this requirement but who have a strong professional background and excellent references may be admitted;
3. Three (3) **letters of recommendation** concerning the applicant's previous academic and professional work;
4. No GRE required
5. International applicants must submit **English proficiency scores** in accordance with UAB Graduate School requirement. Click here for details.
6. Verification of registration by examination as a Professional Engineer (PE) will satisfy criterion 2.

Doctor of Philosophy in Civil Engineering Program Requirements

This is a joint program with the University of Alabama in Huntsville (UAH). A typical student entering the program will already have an undergraduate degree in Civil Engineering from a program accredited by the Engineering Accreditation Commission of ABET. Students with outstanding records in related fields or from a non-accredited engineering program will be considered for admission with contingencies and must remedy deficiencies in their preparation after the start of their academic program. These requirements will be defined in writing at the time of admission.

The program requires 48 credit hours of coursework beyond the baccalaureate level or 27 credit hours of coursework beyond the master's degree, plus a minimum of 24 credit hours of dissertation research (CE 799 Dissertation Research).

A minimum of 6 credit hours must be taken from the UAH campus. The student has two options

1. Register at UAH and then have the credits transferred to UAB or
2. Register at UAB for an equivalent course and have the UAH instructor send the grade to UAB.

The courses may be taken through the Intercampus Interactive Telecommunications System (IITS) at UAB, Distance Learning (DL), or web-based instruction for UAH.

Special Topics (690/790) courses and Individual Study (691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined credit hours of Special Topics and/or Independent Study courses will be applied to the degree without appeal to and prior approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-elevel course for credit if they have previously taken the related 400-level or 600 level course, respectively.

Doctoral students are also required to successfully complete GRD 717 Principles of Scientific Integrity prior to admission to candidacy.

A Graduate Study Committee must be established by the doctoral student and must include a minimum of five graduate faculty members, at least one of which must be from UAH. A comprehensive examination is required of all doctoral candidates. This examination is conducted by the Graduate Study Committee after all coursework is successfully completed. The examination has both written and oral components. During the oral portion of the examination, the student also presents the dissertation proposal to the Graduate Study Committee. The comprehensive examination may only be taken twice.

When the graduate student successfully passes the comprehensive examination, including the dissertation proposal, the student should apply to enter candidacy. Once a doctoral candidate, the student must complete a minimum of 24 credit hours of dissertation research (CE 799 Dissertation Research) over the course of at least two semesters. Prior to admission of candidacy, the student can take research hours in the form of non-dissertation credit hours (CE 798 Non-Dissertation Research); these non-dissertation credit research hours cannot be converted from non-dissertation research credit hours into dissertation research credit hours.

After successful completion of a minimum of 24 credit hours of dissertation research, the graduate student must complete the dissertation and submit to the Graduate Study Committee for review. The doctoral candidate must also present an oral public defense of the dissertation. When the graduate student successfully defends the dissertation, the student then has ten working days to complete revisions and submit the approved document to the Graduate School.

Required coursework must be selected from the list below. PhD students are encouraged to take the highest level available (700 level rather than 600 level; 600 or 700 level rather than 500 level). Students are only allowed to take 500 level courses if there is no equivalent 600 or 700 level course available. A minimum of 50 percent of the required coursework must be at the graduate level of 600 or above.

Additional graduate courses can be counted towards the PhD degree, as long as those courses were taken above and beyond the requirements for a BS or MS degree. To do so requires that the student must petition the department to have those courses counted toward an advanced degree. The graduate program director would make a

recommendation on the petition (and would consider the UAB equivalent course description if the course was taken from another university). The maximum credit hours from an outside institution that could be applied toward an advanced degree at UAB is 12 credit hours.

Requirements		Hours
Required Courses		
GRD 717	Principles of Scientific Integrity	3
CE 799	Dissertation Research [1]	24
Construction Engineering Management Courses [2]		
CE 515	Building Information Modeling (BIM) [3]	
CE 575	Construction Safety and Health Management	
CE 597	Construction Engineering Management	
CE 600	Sustainable Construction	
CE 790	Special Topics in (Area) [4]	
CE 791	Individual Studies (In Area) [4]	
CECM 669	Advanced Project Management	
CECM 670	Construction Estimating and Bidding	
CECM 671	Construction Liability & Contracts	
CECM 672	Construction Methods and Equipment	
CECM 673	Project Planning and Control	
CECM 674	Green Building Design/Construction	
CECM 675	Advanced Construction and Engineering Economics	
CECM 676	Construction Project Risk Management	
CECM 688	Construction Management and Leadership Challenges in the Global Environment	
CECM 689	Building Information Modeling (BIM) Techniques [3]	
Structural Engineering Courses [2]		
CE 516	Mechanical Vibrations	
CE 520	Advanced Mechanics	
CE 526	Foundation Engineering	
CE 544	Civil Engineering Analysis II	
CE 553	Design of Wood Structures	
CE 554	Design of Masonry Structures	
CE 556	Prestressed Concrete Design	
CE 557	Concrete Technology	
CE 560	Structural Mechanics	
CE 561	Introduction to the Finite Element Method	
CE 562	Advanced Structural Analysis	
CE 564	Structural Dynamics	
CE 568	Bridge Engineering	
CE 612	Theory of Elasticity	
CE 617	Theory of Plates and Shells	
CE 650	Advanced Structural Steel	
CE 655	Advanced Reinforced Concrete	
CE 712	Theory of Elasticity	
CE 715	Theory of Elastic Stability	
CE 717	Theory of Plates and Shells	
CE 750	Advanced Structural Steel	
CE 755	Advanced Reinforced Concrete	
CE 790	Special Topics in (Area) [4]	
CE 791	Individual Studies (In Area) [4]	
CESC 602	Introduction to Sustainable Smart Cities [5]	
CESC 608	Green Infrastructure and Transportation [5]	
CESC 614	Smart Cities Technologies [5]	
Environmental Engineering Courses [2]		
CE 530	Water Supply/Drainage Design	
CE 531	Energy Resources	
CE 533	Solid and Hazardous Wastes Management	
CE 534	Air Quality Modeling and Monitoring	
CE 537	Environmental Experimental Design and Field Sampling	
CE 580	Introduction to Water and Wastewater Treatment	
CE 585	Engineering Hydrology	
CE 600	Sustainable Construction	
CE 608	Green Building Design	
CE 610	The Engineered Environment	
CE 636	Stormwater Pollution Management	
CE 640	Wastewater Treatment Engineering	
CE 731	Environmental Law	
CE 732	Industrial Waste and Wastewater Treatment	
CE 736	Stormwater Pollution Management	
CE 738	Water and Wastewater Chemistry	
CE 739	Sediment Sources and Controls	
CE 740	Wastewater Treatment Engineering	
CE 781	Environmental Chemistry	
CE 782	Water Treatment Engineering	
CE 783	Water and Wastewater Treatment Processes Lab	
CE 786	Engineering Hydrogeology	
CE 787	Stormwater Detention Pond Design	
CE 790	Special Topics in (Area) [4]	
CE 791	Individual Studies (In Area) [4]	
CESC 600	Principles of Sustainable Development	
CESC 602	Introduction to Sustainable Smart Cities	
CESC 608	Green Infrastructure and Transportation	
Transportation Engineering Courses [2]		
CE 543	Pavement Design & Construction	
CE 621	Transportation Engineering Seminar	
CE 622	Traffic Flow Theory	
CE 624	Simulation Models for Transportation Applications	
CE 625	Intelligent Transportation Systems	
CE 646	Traffic Engineering Operations	
CE 648	Urban and Transportation Planning	
CE 721	Transportation Engineering Seminar	
CE 722	Traffic Flow Theory	
CE 723	Non-Motorized Transportation Design and Planning	
CE 724	Simulation Models for Transportation Applications	
CE 725	Intelligent Transportation Systems	
CE 790	Special Topics in (Area) [4]	
CE 791	Individual Studies (In Area) [4]	

1 Minimum 24 hours of dissertation research taken over the course of at least two semesters following admission to candidacy

2 MEng courses (i.e., CECM, CESC, CESE) can be applied toward PhD degree requirements

3 Only one of these courses can be applied to the degree

4 Or any CE 690/790 IITS course offerings from UAH, USA, and/or UA campuses with prior approval of Program Director

5 Only one of these courses can be applied to the degree

Admission Requirements

The coordinated Public Health/Civil Engineering degree program is offered through the UAB School of Engineering (SOE) and the School of Public Health (SOPH). Earning these two advanced degrees provides students with a foundation for positions in research, government, as

well as private industry. Students in this coordinated program earn a Doctor of Philosophy in Civil Engineering (PhD). The PhD program is intended for students who have achieved high levels of scholarship and are capable of conducting independent and original research. PhD students in civil engineering will work closely with faculty in the Department of Civil, Construction and Environmental Engineering, but they may also work on interdisciplinary teams with faculty from other UAB departments as well as outside industry. The program offers a broad curriculum covering engineering designs, resilient and sustainable urban development, low carbon and renewable energy systems, green infrastructure, natural resource management, health and livability, transport and mobility, big data analytics, and smart technologies. In addition to the PhD, students earn a Master of Public Health (MPH) with a concentration in Population Health. In this concentration, students gain a solid foundation in public health through completion of the MPH core (based on the Evidence-based Public Health framework), an Applied Practice Experience (Internship), and an Integrative Learning Experience (Capstone). Students also complete environmental health sciences courses focusing on urban health issues including air and water pollution, occupational safety, and assessing and managing environmental risks. Graduates of this coordinated degree program will conduct research in and create solutions for human habitats that are safe, clean, and sustainable addressing issues such as the growing stressors of energy security, population growth and health, food supply, waste disposal, climate change, and future infrastructure demands.

In addition to the UAB Graduate School admission requirements, requirements for admission to the program leading to the Doctor of Philosophy in Civil Engineering degree include the following five criteria:

1. An undergraduate engineering degree from an ABET accredited program or a master's degree in engineering. Applicants who do not meet this criterion but who have an outstanding academic record in an engineering degree program not accredited by ABET, or in a baccalaureate or master's degree program in a related field, may be admitted on probation. Students admitted in this category will be required to complete a sequence of undergraduate or graduate courses in addition to the regular requirements of the MSCE degree. This set of extra requirements will be specified in writing at the time of admission to the program.
2. An undergraduate GPA of 3.0 or higher on a 4.0 scale in all undergraduate degree major courses attempted. Individuals not meeting this requirement but who have a strong professional background and excellent references may be admitted.;
3. Three (3) letters of evaluation concerning the applicant's previous academic and professional work; and
4. **No GRE required.**
5. International students are required to have a bachelor's or master's degree in engineering or a science related field and must submit TOEFL, IELTS, PTEA, IELA, or Duolingo scores. (https://www.uab.edu/graduate/admissions/international-applicants#english-proficiency-exams). Duolingo scores are preferred by the UAB Graduate School.
6. Verification of registration by examination as a Professional Engineer (P.E.) will satisfy criterion 2 above.

Doctor of Philosophy in Civil Engineering and Master of Public Health with a concentration in Population Health

Two curricula have been developed for this coordinated program, one for students entering with a Master's of Science in Civil Engineering (MSCE) or closely related field and another for students entering without an MSCE, most likely with on a baccalaureate degree in Civil Engineering or closely-related field. The curriculum planning grid and a breakdown of coursework by degree program is attached for both options are attached. For students entering with an MSCE degree, a total of 81-83 credit hours of coursework are required for the coordinated PhD/MPH Normally, 42-44 credit hours are required for the MPH; however, because of the coordinated nature of the degree 12 credit hours from the PhD curriculum are credited to the MPH This allows students to earn both degrees in reduced time and at reduced cost. The PhD program 27 credit hours of coursework beyond the master's degree, plus a minimum of 24 credit hours of dissertation research. For students entering without an MSCE degree, a total of 90-92 credit hours of coursework are required for the coordinated PhD/MPH Normally, 42-44 credit hours are required for the MPH; however, because of the coordinated nature of the degree 12 credit hours from the PhD curriculum are credited to the MPH Twelve credit hours from the MPH degree are used to meet PhD program requirements. This allows students to earn both degrees in reduced time and at reduced cost. The PhD program requires 48 credit hours of coursework beyond the master's degree, plus a minimum of 24 credit hours of dissertation research. Students may complete the MPH portion of this coordinated degree program totally online, in class or through a mix of online and in-class experiences. Online students pay less than the out-of-state tuition rate for the MPH portion of this coordinated degree.

Curriculum for students entering with an acceptable bachelor's degree

Requirements		Hours
MPH Core Requirements		14
PUH 601	This is Public Health	
PUH 602	Community Assessment	
PUH 603	Quantitative Methods in Public Health	
PUH 604	Programs and Policies	
PUH 605	Public Health Management and Evaluation	
PUH 606	Leadership for Evidence-Based Public Health	
MPH Degree Requirement		1
ENH 690	Environmental Health Perspectives	
Population Health Degree Requirement		3
PUH 610	Population Health	
Environmental Health Sciences Recommended Courses [1]		7
ENH 600	Fundamentals of Environmental Health Science	
ENH 612	Assessing & Managing Environmental Risks	
ENH 660	Fundamentals of Air and Water Pollution	
MPH Applied Practice Experience		3
PUH 688	Public Health Internship	
MPH Integrative Learning Experience		2
ENH 689	Environmental Health Sciences Integrative Learning Experience	
Total Unique SOPH Hours: minimum 30 required [2]		
Shared Hours from PhD in Civil Engineering		12
CE 530	Water Supply/Drainage Design	
CE 580	Introduction to Water and Wastewater Treatment	
CE 608	Green Building Design	

CE 685	Engineering Hydrology	
CE 608	Green Building Design	
CE 685	Engineering Hydrology	
Total Hours Earned for MPH Degree: 42 hours [3]		
Remaining Hours from PhD in Civil Engineering Program Requirements [4]		
CE 740	Wastewater Treatment Engineering	
CE 786	Engineering Hydrogeology	
CE 787	Stormwater Detention Pond Design	
GRD 717	Principles of Scientific Integrity	
CE 799	Dissertation Research [5]	
CE Electives		12
Total Hours Earned for PhD in Civil Engineering: 72 Hours [5]		
Total Hours Completed for PhD in Civil Engineering/MPH Degree		

1 Student may substitute ENH courses to meet their educational objectives with consent of advisor (7 credit hours minimum required)
2 Meets UAB Graduate School requirements of a minimum 30 hours of graduate work
3 Meets the CEPH MPH requirements of a minimum of 42 semester hours
4 Course substitutions may be made with consent of advisor; Assumes the recommended Environmental Health Sciences courses plus PUH 610 Population Health (12 credit hours); A minimum of 72 total credit hours are required, 48 hours of coursework and 24 hours of dissertation research
5 A minimum of 24 credit hours, taken over at least 2 terms, are required

Curriculum for students entering with an acceptable Master's degree

Requirements		Hours
MPH Core Requirements		14
PUH 601	This is Public Health	
PUH 602	Community Assessment	
PUH 603	Quantitative Methods in Public Health	
PUH 604	Programs and Policies	
PUH 605	Public Health Management and Evaluation	
PUH 606	Leadership for Evidence-Based Public Health	
MPH Degree Requirement		1
ENH 690	Environmental Health Perspectives	
Population Health Degree Requirement		3
PUH 610	Population Health	
Environmental Health Sciences Recommended Courses [1]		7
ENH 600	Fundamentals of Environmental Health Science	
ENH 612	Assessing & Managing Environmental Risks	
ENH 660	Fundamentals of Air and Water Pollution	
MPH Applied Practice Experience		3
PUH 688	Public Health Internship	
MPH Integrative Learning Experience		2
ENH 689	Environmental Health Sciences Integrative Learning Experience	
Total Unique SOPH Hours: minimum 30 required [2]		
Shared Hours from PhD in Civil Engineering		12
CE 530	Water Supply/Drainage Design	
CE 580	Introduction to Water and Wastewater Treatment	
CE 608	Green Building Design	
CE 685	Engineering Hydrology	
Total Hours Earned for MPH Degree: 42 hours [3]		
Remaining Hours from PhD in Civil Engineering Program Requirements [4, 6]		
CE 740	Wastewater Treatment Engineering	
CE 786	Engineering Hydrogeology	
CE 787	Stormwater Detention Pond Design	
GRD 717	Principles of Scientific Integrity	
CE 799	Dissertation Research [5]	
CE Electives		3
Total Hours Earned for PhD in Civil Engineering: 72 Hours [6]		
Total Hours Completed for PhD in Civil Engineering/MPH Degree		

1 Student may substitute ENH courses to meet their educational objectives with consent of advisor (7 credit hours minimum required)
2 Meets UAB Graduate School requirements of a minimum 30 hours of graduate work
3 Meets the CEPH MPH requirements of a minimum of 42 semester hours
4 Course substitutions may be made with consent of advisor
5 A minimum of 24 credit hours, taken over at least 2 terms, are required
6 Assumes the recommended Environmental Health Sciences courses plus PUH 610 Population Health (12 credit hours); A minimum of 72 total credit hours are required, 48 hours of coursework and 24 hours of dissertation research

CE-Civil Engineering Courses

CE 515. Building Information Modeling (BIM). 3 Hours.
This class provides an introduction to the virtual world of design and construction. Topics covered include uses for technology, what is BIM, and have a focus on AutoCAD and Revit Software. An emphasis is placed on the use of these tools and their practical applications to the real world environment. Students are provided with the software through the Autodesk Student community and are required to complete a Multi-Step term Project.

CE 516. Mechanical Vibrations. 3 Hours.
Free and forced single-degree-of-freedom systems. Multi-degree-of-freedom systems. Damped, forced two-degree-of- freedom systems. Simple continuous systems.

CE 520. Advanced Mechanics. 3 Hours.
Variation of stress at point including determination of principal and maximum shear stresses. Basic problems involving symmetrical deformation; thickwall cylinders, spheres, and rotating disk. Torsions of noncircular sections. Curved beams. Failure Theories. Unsymmetrical bending and shear center.

CE 526. Foundation Engineering. 3 Hours.
Application of principles of soil mechanics to: determine bearing capacity and settlement of spread footings, mats, single piles and pile groups; site investigation, evaluate data from field and laboratory tests; estimation of stresses in soil masses; lateral resistance of piles and pile groups; retaining walls, sheetpiles and coffer-dams.

CE 530. Water Supply/Drainage Design. 3 Hours.
Water requirements; wastewater characteristics. Hydraulics and design of sewers; distribution, and reuse of water. Development of water supplies; design considerations.

CE 530L. Water Supply/Drainage Design Laboratory. 0 Hours.
The laboratory exercises are designed to assist the student in the investigation of water supply and drainage design including the analysis of water networks, pipe network design, storm-water and sewer collection network design, flow path visualization, hydraulic jump, flow over weirs, channel design, and basin modeling. Companion lab to CE 530 and must be taken concurrently.

CE 531. Energy Resources. 3 Hours.
Overview of the various energy resources: oil, natural gas, coal, nuclear, hydro, solar, geothermal, biomass, wind, and ocean energy resources, in terms of supply, distribution, recovery and conversion, environmental impacts, economies, policy, and technology. Concepts and opportunities for energy conservation; including electric power generation, changing role of electric utilities, transportation applications, and energy use in developing countries. Field trips.

CE 533. Solid and Hazardous Wastes Management. 3 Hours.
Overview of waste characterizations, regulations, and management options.

CE 534. Air Quality Modeling and Monitoring. 3 Hours.
Atmospheric pollutants; effects, reactions, and sources. Air pollution meteorology and dispersion modeling. Ambient monitoring.

CE 537. Environmental Experimental Design and Field Sampling. 3 Hours.
Experimental design, sensitivity analyses, water sampling, and flow monitoring. Receiving water chemical reactions. Field investigations.

CE 537L. Environmental Experimental Design and Field Sampling Lab. 0 Hours.
Lab experiences in environmental experimental design and field sampling.

CE 542. Highway Materials and Construction. 3 Hours.
Properties of materials used in highway construction. Construction methods and management.

CE 543. Pavement Design & Construction. 3 Hours.
Analysis of stresses and strains in pavement systems. Design and construction of flexible and rigid pavements, base courses and subgrades. Effects of loading on pavement life.

CE 544. Civil Engineering Analysis II. 3 Hours.
Sampling and experimental design. Hypotheses testing. Decision Analyses. Multiple regression analyses. Nonparametric methods. Analysis of experimental data in civil engineering research; regression, experimental design, non-parametrical analysis.

CE 545. Engineering the Built Environment. 3 Hours.
This service learning course explores the effects the built environment has on urban function, connectivity, community health, and the well-being of its residents. Students work directly in Birmingham neighborhoods learning how to assess different components of the built environment, including transportation, green spaces, lighting, and blight, and to estimate their impacts on community health and well-being. Students then work with representatives from the city, neighborhoods, and local industry to propose engineering solutions, develop realistic cost estimates, assess potential benefits, and develop implementation plans.

CE 546. Green Infrastructure and Transportation. 3 Hours.
This course covers policy and technical issues related to sustainable transportation. The course begins by discussing the concepts, viewpoints, and fundamentals essential for understanding sustainable transportation planning. Tools used to assess sustainability of transportation facilities and neighborhoods are introduced next. The course also presents design options in support of green infrastructure and transportation, including livable street design, and traffic calming applications. The course is expected to expand students' knowledge base on sustainable transportation issues and help them understand the concept of sustainable transportation toward the development of sustainable smart cities.

CE 547. Principles of Sustainable Development. 3 Hours.
The course presents the concepts, viewpoints and fundamentals essential for understanding the urban sustainable development agenda. Students will review basic earth sciences to better evaluate the impact our anthropogenic activities have on the natural environment and therefore how to minimize adverse future outcomes. Throughout the course case studies of sustainable developments will be used to illustrate the value, challenges and limitations of this concept. In the end, students will possess the knowledge base needed to help advance sustainable smart cities development.

CE 553. Design of Wood Structures. 3 Hours.
This course will give students an understanding of structural wood materials, both sawn lumber and a number of engineered wood materials. The main objective of the course is to learn how to design wood structures using these materials, including the design of beams, columns, connections, roof diaphragms, and shear walls. The requirement of the National Design Specification for Wood Structures will be addressed.

CE 554. Design of Masonry Structures. 3 Hours.
Design and detailing of masonry structures. Nomenclature, properties, and specifications for components. Design of assemblages, simple masonry structures, unreinforced and reinforced elements, and complex masonry structures.

CE 556. Prestressed Concrete Design. 3 Hours.
Principles and concepts of design in prestressed concrete including elasticand ultimate strength analysis for flexural, shear, bond, and deflections. Principles of concordance and linear transformation for indeterminate prestressed structures.

CE 557. Concrete Technology. 3 Hours.
Properties of concrete in relation to specifying, purchasing, and evaluating concrete materials. Fresh and hardened concrete properties. Concrete mix design procedures. Effects of finishing, curing, weather conditions, and various construction procedures. Ready mix concrete production and field placement techniques. Specifications writing to ensure good quality concrete and field inspection procedures. Case studies of problems in concrete construction.

CE 560. Structural Mechanics. 3 Hours.
Elastic beam deflections, beam columns, lateral torsional buckling, column stability, plastic design, plate bending, yield line theory.

CE 561. Introduction to the Finite Element Method. 3 Hours.
Concepts and applications of the finite element method. Development and applications of basic finite elements. Software use.

CE 562. Advanced Structural Analysis. 3 Hours.
Analysis of indeterminate structures using classical and matrix methods. Use of large-scale computer programs.

CE 564. Structural Dynamics. 3 Hours.
Closed form and numerical solutions to single-degree-of-freedom structural models. Analysis of multistory frames. Computer application and seismic analysis. Techniques of modal analysis.

CE 565. CE Construction Documents. 3 Hours.
Introduction to Civil Engineering design and construction documents including drawings, specifications, contracts, and testing reports. Overview of civil infrastructure and project types, including the civil engineer's role in the preparation, certification, and use of construction documents. Construction topics include measurement, quantity estimating, and engineering budgets.

CE 567. Wind and Seismic Loads. 3 Hours.
Methods for calculating loads on structures caused by extreme winds and earthquakes. Calculation of wind loads on various types of structures according to theory and codes. Determination of earthquake loads on structures using structural dynamics and codes.

CE 568. Bridge Engineering. 3 Hours.
Bridge loads, steel beam bridges, composite beam bridges, bridge bearings, reinforced and prestressed concrete slab and T-beam bridges, bridge evaluations and ratings, upgrade methodologies, computer applications.

CE 570. International Research Experience. 3 Hours.
The International Research Experience for Students (IRES) program provides the opportunity for undergraduate and graduate students to participate in hands-on engineering research in an international setting. Students perform research on an approved topic related to civil engineering design in an international environment. Students select a topic, perform a detailed literature review, and work with mentors from UAB and the international host institution to develop research objectives and a detailed research plan. The course will culminate in a 6-8 week visit to the international host institution, during which time students will conduct hands-on research with their mentors and prepare final reports.

CE 575. Construction Safety and Health Management. 3 Hours.
This course covers various causes of construction accidents and the adopted strategies to prevent worksite injuries and illnesses. Other topics covered include workers' compensation, OSHA standards for the construction industry, economics of construction safety management, temporary structures, system safety, ergonomic applications, health hazards, and the development of a safety program.

CE 580. Introduction to Water and Wastewater Treatment. 3 Hours.
Physical unit operations, and chemical/biological unit processes for water and wastewater treatment. Design of facilities for treatment. Treatment and disposal of sludge.

CE 585. Engineering Hydrology. 3 Hours.
Hydrologic principles including hydrology cycle, precipitation data, and stream-flow measurements. Applications to engineering problems; stream-flow analysis and watershed management.

CE 590. Special Topics in Civil Engineering. 1-6 Hour.
Special Topic in Civil Engineering.

CE 591. Individual Study in Civil Engineering. 1-6 Hour.
Individual Study in Civil Engineering.

CE 597. Construction Engineering Management. 3 Hours.
Study of construction management services that include: project planning, scheduling, estimating, budgeting, contract administration, agreements, and ethics. Emphasis is made on the management of manpower, materials, money and machinery.

CE 600. Sustainable Construction. 3 Hours.
Study of sustainable construction techniques and best practices. Provides an understanding of the interdependencies between planning, designing, building, operating, and demolishing the built environment and their impacts on the natural environment. Course topics will include: (1) issues of recourse efficiency, economics, ethics, waste, human health, environmental justice, and industrial ecology; (2) alternative practices that significantly reduce adverse environmental impacts of built infrastructure, and (3) explore past and present thinking of engineering practitioners in this newly emerging discipline.

CE 605. Project Management. 3 Hours.
Presents the theory and practice of project management as a distinct discipline with applications in time, cost, and performance management. Managerial, organizational, behavioral and cost benefit aspects of project management are covered, as well as various applied models for organizing, executing, and monitoring a project. Basic estimating techniques to determine cost and time for construction work packages are discussed followed by scheduling model techniques to include the Critical Path Method (CPM), Precedence Diagramming Method (PDM), Program Evaluation and Review Technique (PERT), and Gantt charts.

CE 607. Engineering Entrepreneurship. 3 Hours.
Course focuses on the entrepreneurial engineer--a new type of engineer who needs a broad range of business skills and knowledge above and beyond a strong science and engineering background. The course will introduce engineering students to the key aspects of engineering entrepreneurship including business planning, solving problems, risk taking, financing, marketing, and entrepreneurial leadership. The students will also be introduced to the many opportunities and challenges that accompany starting and operating an entrepreneurial venture. Entrepreneurial company leaders will present their experiences and share their leadership styles as part of the course.

CE 608. Green Building Design. 3 Hours.
Quantitative introduction to the principles of "Green Building Design". Provides students an understanding of the interdependencies between economics, technology, design, building occupation and the subsequent impact on the natural environment. Course will emphasize green building materials, new technologies, and sustainable construction methods. Course also includes LEED Case Studies (industrial, commercial, residential, and institutional examples).

CE 610. The Engineered Environment. 3 Hours.
Fundamentals of environmental engineering as they apply to the construction of the built environment and contemporary issues faced by engineers in developing nations such as Egypt. Topics include air pollution, solid waste management, water treatment, environmental ethics, etc.

CE 612. Theory of Elasticity. 3 Hours.
Equations of linear reduction to plane stress, plane strain, and generalized plane strain. Airy and love stress functions in solution of problems.

CE 615. Theory of Elastic Stability. 3 Hours.
Static stability of bars, beams, trusses, and rigid frames. Dynamic stability of bars. Energy method applied to bucking problems. General theory of elastic stability.

CE 617. Theory of Plates and Shells. 3 Hours.
Linear theory and solutions of plates and various shapes. Large deflection theory and solutions of rectangular and circular plates. Membrane and bending theories of shells. Solutions of problems in conical, cylindrical, and spherical shell.

CE 621. Transportation Engineering Seminar. 1 Hour.
Seminar focusing on student research and guest presentations of various topics of interest to graduate transportation engineering students.

CE 622. Traffic Flow Theory. 3 Hours.
Microscopic and macroscopic traffic flow characteristics. Traffic flow analytical techniques including car-following models, traffic stream models, shock wave analysis, queuing analysis and gap acceptance. Simulation models for network analysis.

CE 623. Non-Motorized Transportation Design and Planning. 3 Hours.
Urban planning principles that support non-motorized transportation, local bicycle or pedestrian plans, non-motorized transportation safety related considerations, non-motorized transportation design including traffic calming techniques, procedures for capacity analysis of pedestrian facilities.

CE 624. Simulation Models for Transportation Applications. 3 Hours.
Basic concepts of simulation models for analysis and optimization of transportation systems. Experimentation with planning simulation models and traffic models for signal timing and capacity analysis.

CE 625. Intelligent Transportation Systems. 3 Hours.
Legal, institutional and planning issues related to intelligent transportation systems. System architecture, communication techniques, advanced user services, intermodal systems, connected and autonomous vehicles applications.

CE 631. Environmental Law. 3 Hours.
Law as it applies to the practicing environmental engineer. New and emerging regulations.

CE 632. Industrial Waste and Wastewater Treatment. 3 Hours.
Solid wastes and wastewaters from various industries. Assessment of treatability, system design, and equipment selection.

CE 633. Solid and Hazardous Waste Management. 3 Hours.
Provides students a quantitative introduction to solid and hazardous waste characterizations, international regulations, and management options. Course topics to include (1) Solid waste management hierarchy (reduce, reuse, recycle, recovery, responsible disposal); (2) Dry tomb landfill design; and (3) Hazardous waste identification and treatment/disposal.

CE 636. Stormwater Pollution Management. 3 Hours.
Quality and quantity of stormwater. Receiving water problems and sources of pollutants. Runoff quality and quantity characterizations. Erosion control. Selection and design of controls; regulations.

CE 638. Water and Wastewater Chemistry. 3 Hours.
Aquatic chemistry. Chemical behavior of pollutants in receiving waters. Fate of common pollutants. Chemical kinetics in natural waters. Photochemical reactions. Modeling of wastewater discharges.

CE 639. Sediment Sources and Controls. 3 Hours.
Erosion and sediment transport areas; design of common erosion control practices.

CE 640. Wastewater Treatment Engineering. 3 Hours.
Wastewater sources and characteristics. Design and operation of wastewater treatment facilities, including grit removal, oil and grease removal, dissolved air flotation, activated sludge process, trickling filters, and rotating biological contractors, stabilization ponds and aerated lagoons, anaerobic processes for wastewater treatment and sludge digestion. Ultimate disposal of wastewater residues and considerations of discharge criteria.

CE 643. Pavement Design and Construction. 3 Hours.
Design and construction of flexible and rigid pavements. Topics include stress and strain responses, design parameters, AASHTO and NAPA design procedures, pavement construction, pavement rehabilitation, and maintenance techniques.

CE 646. Traffic Engineering Operations. 3 Hours.
Highway and intersection capacity analysis, traffic signal timing and phasing, signal coordination, freeway operations, non-signalized traffic control techniques.

CE 648. Urban and Transportation Planning. 3 Hours.
Land use planning for transportation systems; trip generation, trip distribution, modal split, and traffic assignment.

CE 649. Engineering Liability. 3 Hours.
Laws related to liability for engineering design in the context of product liability and construction projects; roles and liabilities between various parties involved in construction projects.

CE 650. Advanced Structural Steel. 3 Hours.
Beams, columns, tension members, and connections; current research.

CE 655. Advanced Reinforced Concrete. 3 Hours.
Beam, column, and slab actions; current research.

CE 658. Engineering Management. 3 Hours.
Management techniques for the practicing engineer.

CE 663. Finite Element Methods. 3 Hours.
Theory and applications in structural mechanics. Plane stress, plane strain, axisymmetric problems, solids, plates, shells, nonlinear systems.

CE 681. Environmental Chemistry. 3 Hours.
Chemical equilibrium, acid/base, chemical concepts in pollutant behavior. Chemical kinetics, redox system, hydrolysis, pesticides, chemical wastes.

CE 682. Water Treatment Engineering. 3 Hours.
Water sources and characteristics. Design and operations of water treatment facilities. Topics Include lime softening operations, coagulation, flocculation, clarification dissolved air flotation, filtration, disinfection, absorption, ion exchange and sludge management.

CE 683. Water and Wastewater Treatment Processes Lab. 3 Hours.
Construction and evaluation of bench-scale treatment processes. Treatability of water and wastewater. Coagulation of sedimentation, settleability of biological sludge, aerobic biological treatment, chemical treatment, water softening toxicity, disinfection, and sludge treatment processes.

CE 685. Engineering Hydrology. 3 Hours.
Hydrologic principles including hydrologic cycle, precipitation data, and stream-flow measurements. Applications to engineering problems; stream-flow analysis and watershed management.

CE 686. Engineering Hydrogeology. 3 Hours.
Groundwater movement, natural quality, contamination, and restoration. Physical and chemical properties of groundwater. Well hydraulics and flow net analyses. Prevention and control of groundwater contamination.

CE 687. Stormwater Detention Pond Design. 3 Hours.
Stormwater problems and control methods. Urban hydrology prediction procedures for drainage and water quality studies. Detention pond design basics, limitations and multiple benefits.

CE 688. Strategic Management and Leadership Applications in a Global Environment. 3 Hours.
This course is designed to prepare students to face the demanding management and leadership challenges facing construction and engineering industry leaders as competition becomes ever more globalized. The necessity to personally remain trained and relevant in the changing business environment is emphasized. Strategic planning, management and leadership in the built environment requires savvy leaders with exceptionally developed analytical and communications skills suitable for multi-disciplinary and multi-national ventures. Every individual and organization must continually innovate and reinvent to stay competitive. In a competitive environment, a strong working knowledge of the financial markets is essential and students are exposed to multiple lessons presented by financial industry practitioners. Students participate in a group project designed to reinforce the methodology associated with preparing and presenting a dynamic business plan. This course provides the opportunity for students to discuss and research these concepts and to recognize the necessity to think independently, challenge conventional thinking, and visualize alternatives.
Prerequisites: CE 669 [Min Grade: C]

CE 689. Building Information modeling (BIM) Techniques. 3 Hours.
This course provides students with an overview of the evolution of BIM technology in the construction industry followed by hands-on training in the basic application of contemporary BIM software. Students will learn basic modeling skills and how to produce graphical presentations. Advanced applications of BIM technology are discussed and demonstrated. Students will be provided with BIM software and are required to complete a multi-step BIM model as a term project.

CE 690. Special Topics in (Area). 1-3 Hour.
Special Topics (Area).

CE 691. Individual Study in (Area). 1-4 Hour.
Individual Study (Area).

CE 692. CE Capstone Project. 3 Hours.
This course covers specific contemporary topics related to civil engineering practice and knowledge. Capstone project using case studies to apply skills, knowledge, techniques, and concepts developed in prior courses.

CE 693. Applied Research in Civil, Construction, and Environmental Engineering. 3-9 Hours.
Research tools, including elements of experimental design and proposal preparation. Effective communication, literature searches, and exploratory data analysis.

CE 695. International Construction Contracts/Liability. 3 Hours.
Provides an overview of the fundamental aspects of the law that affects construction and engineering companies as well as the project owners. Particular emphasis is placed on contract forms and provisions related to liability for engineering design and construction companies, the roles of the typical participation in the process, and dispute resolution.

CE 697. Master's Project. 3-9 Hours.
A UAB Master's Project must demonstrate evidence of scholarly study and writing that ultimately contributes to the scientific knowledge base. This course is designed to allow students the opportunity to develop original ideas or seek to advance knowledge through theory, conceptualization, design, testing of tools, instruments, or procedures relevant to the practice of civil engineering.

CE 698. Non-Thesis Research. 1-12 Hour.

CE 699. Thesis Research. 1-12 Hour.
Prerequisites: GAC M

CE 712. Theory of Elasticity. 3 Hours.
Equations of linear reduction to plane stress, plane strain, and generalized plane strain. Airy and love stress functions in solution of problems.

CE 715. Theory of Elastic Stability. 3 Hours.
Static stability of bars, beams, trusses, and rigid frames. Dynamic stability of bars. Energy method applied to buckling problems. General theory of elastic stability.

CE 717. Theory of Plates and Shells. 3 Hours.
Linear theory and solutions of plates of various shapes. Large deflection theory and solutions of rectangular and circular plates. Membrane and bending theories of shells. Solutions of problems in conical, cylindrical, and spherical shell.

CE 721. Transportation Engineering Seminar. 1 Hour.
Seminar focusing on student research and guest presentation of various topics of interest to graduate transportation engineering students.

CE 722. Traffic Flow Theory. 3 Hours.
Microscopic and macroscopic traffic flow characteristics. Traffic flow analytical techniques including car-following models, traffic stream models, shock wave analysis, queuing analysis and gap acceptance. Simulation models for network analysis.

CE 723. Non-Motorized Transportation Design and Planning. 3 Hours.
Urban planning principles that support non-motorized transportation, local bicycle or pedestrian plans, non-motorized transportation safety related considerations, non-motorized transportation design including traffic calming techniques, procedures for capacity analysis of pedestrian facilities.

CE 724. Simulation Models for Transportation Applications. 3 Hours.
Basic concepts of simulation models for analysis and optimization of transportation systems. Experimentation with planning simulation models and traffic models for signal timing and capacity analysis.

CE 725. Intelligent Transportation Systems. 3 Hours.
Legal, institutional and planning issues related to intelligent transportation systems. System architecture, communication techniques, advanced user services, intermodal systems, connected and autonomous vehicles applications.

CE 731. Environmental Law. 3 Hours.
Law as it applies to the practicing environmental engineer. New and emerging regulations.

CE 732. Industrial Waste and Wastewater Treatment. 3 Hours.
Solid wastes and waste waters from various industries; assessment of treatability, system design, and equipment selection.

CE 736. Stormwater Pollution Management. 3 Hours.
Quality and quantity of stormwater. Receiving water problems and sources of pollutants. Runoff quality and quantity characterizations. Erosion control. Selection and design of controls; regulations.

CE 738. Water and Wastewater Chemistry. 3 Hours.
Aquatic chemistry. Chemical behavior of pollutants in receiving waters. Fate of common pollutants. Chemical kinetics in natural waters. Photochemical reactions. Modeling of wastewater discharges.

CE 739. Sediment Sources and Controls. 3 Hours.
Erosion and sediment transport in urban areas, design of common erosion control practices.

CE 740. Wastewater Treatment Engineering. 3 Hours.
Wastewater sources and characteristics. Design and operation of wastewater treatment facilities, including grit removal, oil and grease removal, dissolved air flotation, activated sludge process, trickling filters, and rotating biological contractors, stabilization ponds and aerated lagoons, anaerobic processes for wastewater treatment and sludge digestion. Ultimate disposal of wastewater residues and considerations of discharge criteria.

CE 749. Engineering Liability. 3 Hours.
Laws related to liability for engineering design in the context of product liability and construction projects; roles and liabilities between various parties involved in construction projects.

CE 750. Advanced Structural Steel. 3 Hours.
Beams, columns, tension members, and connections; current research.

CE 755. Advanced Reinforced Concrete. 3 Hours.
Beam, column, and slab actions; current research.

CE 758. Engineering Management. 3 Hours.
Management techniques for practicing engineers.

CE 763. Finite Element Methods. 3 Hours.
Theory and applications in structural mechanics. Plane stress, plane strain, axisymmetric problems, solids, plates, shells, nonlinear systems.

CE 781. Environmental Chemistry. 3 Hours.
Chemical equilibrium, acid/base, chemical concepts in pollutant behavior. Chemical kinetics, redox system, hydrolysis, pesticides, chemical wastes.

CE 782. Water Treatment Engineering. 3 Hours.
Water sources and characteristics. Design and operation of water treatment facilities including lime softening operations, coagulation, flocculation, clarification, dissolved air flotation, filtration, disinfection, absorption, ion exchange, and sludge disposal.

CE 783. Water and Wastewater Treatment Processes Lab. 3 Hours.
Construction and evaluation of bench-scale treatment processes. Treatability of water and wastewater. Coagulation of sedimentation, settleability of biological sludge, aerobic biological treatment, chemical treatment, water softening toxicity, disinfection, and sludge treatment processes.

CE 786. Engineering Hydrogeology. 3 Hours.
Groundwater movement, natural quality, contamination, and restoration. Physical and chemical properties of groundwater. Well hydraulics and flow net analyses. Prevention and control of groundwater contamination.

CE 787. Stormwater Detention Pond Design. 3 Hours.
Stormwater problems and control methods. Urban hydrology prediction procedures for drainage and water quality studies. Detention pond design basics, limitations and multiple benefits.

CE 790. Special Topics in (Area). 1-3 Hour.
Special Topics in (Area).

CE 791. Individual Studies (In Area). 1-4 Hour.
Individual Studies in (Area).

CE 793. Applied Research in Civil and Environmental Engineering. 3 Hours.
Research tools, including elements of experimental design and proposal preparation. Effective communication, literature searches, and exploratory data analysis.

CE 797. Civil, Construction, and Environmental Engineering Internship. 6 Hours.
Off-campus internship experience working with industries, utilities, or government agencies. Students taking this course will not be allowed to apply Special Topics or Individual Studies courses toward degree requirements.

CE 798. Non-Dissertation Research. 1-12 Hour.

CE 799. Dissertation Research. 1-12 Hour.
Prerequisites: GAC Z

CECM-Construction Egr Mgmnt Courses

CECM 669. Advanced Project Management. 3 Hours.
Skills generally required for sound project management in a variety of management settings are studied in addition to specific management issues typically associated with engineering and construction companies. Students are introduced to the Project Management Institute's Body of Knowledge (PMBOK). A discussion of corporate organizational structures and the evolving use of project management processes helps establish an appreciation for the role of a Project Manager. The elements of a project and the role and responsibilities of the Project Manager are studied in depth. Students are also acquainted with risk management concepts, financial, labor, safety, equipment, and contracting issues facing managers in the engineering and construction environment. Particular emphasis is placed on individual management strengths and weaknesses, team building, and characteristics of successful companies. One of the primary vehicles for discussion will be small case studies from real companies and the outside reading of one or two relevant topical books.

CECM 670. Construction Estimating and Bidding. 3 Hours.
Provides an overview of typical construction delivery systems and the planning and contracting associated with each. A broad study of estimating methodologies ranging from rough "ball park" estimates to detailed unit pricing is presented focusing on labor, equipment, materials, subcontractors, job conditions, location, overhead, and profit. This course is intended to establish a basic understanding of the estimating process; and therefore, substantial course focus will be placed on the term group project.

CECM 671. Construction Liability & Contracts. 3 Hours.
This course provides an overview of the fundamental aspects of the laws that affect construction and engineering companies as well as the project owners. Particular emphasis is placed on contract forms and provisions related to liability for engineering design and construction companies, the roles of the typical participation in the process, and dispute resolution. Students will learn the importance of contract language negotiations and the impact of project risk transfer.

CECM 672. Construction Methods and Equipment. 3 Hours.
This course provides students a big-picture understanding of the construction methods employed to bring the concepts and designs of architects and engineers to physical reality. The importance of building codes is presented in the course material. Detailed study of typical building materials, design details, and construction methods are presented in a logical sequence. Students will understand the planning and deployment of equipment, materials, labor, and subcontractors using a variety of building material and system types. This course provides a necessary baseline of knowledge, vocabulary, and understanding of the role and activities of the designers, engineers, material suppliers, inspectors, and constructors in the commercial building process.

CECM 673. Project Planning and Control. 3 Hours.
This course provides a thorough understanding of the project scheduling process in construction planning and control. Students learn the relationship between the work breakdown structure, organization breakdown structure, and the activities used in developing project schedules. The Critical Path Method (CPM), Precedence Diagram Method (PDM), Program Evaluation and Review Technique (PERT), and Line of Balance (LOB) scheduling methods are discussed in detail to include hand calculations and powerful computer software products. The use of scheduling techniques for project control, resources constraint management, cash flow management, risk management, and project completion date management are investigated as is the importance of communications in the planning and monitoring/controlling processes. Students will experience hands on use with Primavera scheduling software.

CECM 674. Green Building Design/Construction. 3 Hours.
The course addresses the key concepts, viewpoints and fundamentals essential for understanding green building and construction. Materials are focused on how key stakeholders and their future collaborations can begin to incorporate sustainable construction practices for the betterment of the project (new construction and inventory rehabilitation). The course will include instruction suitable to prepare students for the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED©) Green Associates certification exam.

CECM 675. Advanced Construction and Engineering Economics. 3 Hours.
This course provides an extensive overview of financial and managerial accounting concepts for non-financial managers. Students will learn the basic elements of accounting (Generally Accepted Accounting Practices (GAAP)). They will understand how typical financial records and financial statements are established for companies. Once the basics are understood, students will study how financial data is used for internal cost controlling, planning, and budgeting. Fundamental financial calculations associated with the time value of money, debt instruments, taxes, inflation, and cash flow estimates are emphasized. Students will be expected to demonstrate proficiency in the use of Excel business functions in solving financial problems.

CECM 676. Construction Project Risk Management. 3 Hours.
This course addresses the methodologies employed in the engineering and construction industries to assist in rational decision-making in the face of uncertainty. The course reviews the fundamentals of common probabilistic theories and models, data sampling, hypothesis testing and the basics of Bayesian Decision Theory. In addition, basic financial analysis tools will be reviewed. Theoretical models will then be applied to specific examples encountered in engineering and construction decision making with emphasis on engineering economics applications.

CECM 688. Construction Management and Leadership Challenges in the Global Environment. 3 Hours.
This course is designed to prepare students to face the demanding management and leadership challenges facing construction and engineering industry leaders as competition becomes ever more globalized. The necessity to personally remain trained and relevant in the changing business environment is emphasized. Strategic planning, management and leadership in the built environment requires savvy leaders with exceptionally developed analytical and communications skills suitable for multi-disciplinary and multi-national ventures. Every individual and organization must continually innovate and reinvent to stay competitive. Students participate in a group project designed to reinforce the methodology associated with preparing and presenting a dynamic business plan. This course will provide the opportunity for students to discuss and research these concepts and to recognize the necessity to think independently, challenge conventional thinking, and visualize alternatives.

CECM 689. Building Information Modeling (BIM) Techniques. 3 Hours.
This course provides students with an overview of the evolution of BIM technology in the construction industry followed by hands-on training in the basic application of contemporary BIM software. Students will learn basic modeling skills and how to produce graphical presentations. Advanced applications of BIM technology will be discussed and demonstrated. Students will be provided with BIM software and will be required to complete a multi-step BIM model as a term project.

CESC-Sustainable Smart Cities Courses

CESC 600. Principles of Sustainable Development. 3 Hours.
The course will begin by discussing the concepts, viewpoints and fundamentals essential for understanding urban sustainable development agenda. This will be followed by the evaluation of international conferences and action items proposed by the scientific / professional community to advance sustainable smart cities development. You will review basic earth sciences to better evaluate the impact our anthropogenic activities have on the natural environment and therefore how to minimize adverse future outcomes. Throughout the course case studies of sustainable developments will be used to illustrate the value, challenges and limitations of this concept. In the end, you will possess the knowledge base needed to help advance sustainable smart cities development.

CESC 602. Introduction to Sustainable Smart Cities. 3 Hours.
This course introduces the issues surrounding sustainable development within cities and explores how the smart city concept can contribute to the urban sustainable development agenda. The course begins by considering the key characteristics of contemporary urbanization and the issues and challenges that these present for sustainability and urban environmental management. The meaning and nature of sustainability for cities will be discussed, followed by a consideration of the definitions of a smart city and a discussion of the key elements of a smart city including its contribution to both urban governance and the more effective and efficient management of natural resources. With reference to case studies the final part of the course will explore and evaluate the role that smart city processes and applications can play in enhancing the social, economic and environmental aspects of sustainable development within urban areas.

CESC 604. Low-Carbon and Renewable Energy Systems for Smart Cities. 3 Hours.
As the energy infrastructure is arguably the most important feature in any city energy efficiency and integration of renewable energy sources within urban areas are central to the smart city concept. This course will firstly explore why there is a need for the greater use of low carbon and renewable energy systems within cities, followed by an introduction to the range of low carbon and renewable energy technologies currently available. The course will then move on to introduce the concept of the smart grid and then explore the potential to integrate low carbon and renewable energy systems into smart grids in order to move towards cost-effective, efficient and more environmentally friendly energy provision within cities. Challenges and issues associated with the greater integration of low carbon and renewable energy systems into energy infrastructure within large urban areas will also be considered.

CESC 606. Managing Natural Resources and Sustainable Smart Cities. 3 Hours.
The course examines the challenges of resource use and management within the context of an urbanizing world, exploring how new concepts within the smart and sustainable city agenda may contribute to addressing these challenges. The course begins by considering contemporary patterns of resource use created by cities in the modern world at a variety of scales from the local to the global. New approaches in the form of ecosystem services and urban metabolism in relation to natural resource management are examined in terms of their contribution to developing a smart and sustainable city agenda. The course continues by exploring a selection of key natural resources challenges (e.g. water, energy, air quality and climate) and the development of new management approaches and strategies in these areas. The course concludes by examining the development of integrated environmental management systems and governance structures within which these new approaches can be implemented with reference to a series of case studies.

CESC 608. Green Infrastructure and Transportation. 3 Hours.
The course covers policy and technical issues related to sustainable transportation. The course begins by discussing the concepts, viewpoints and fundamentals essential for understanding sustainable transportation planning. Tools used to assess sustainability of transportation facilities and neighborhoods are introduced next. The course also presents design options in support of green infrastructure and transportation, including livable street design, and traffic calming applications. The course is expected to expand students' knowledge base on sustainable transportation issues and help them understand the concept of sustainable transportation toward the development of sustainable smart cities.

CESC 610. Health and Livability. 3 Hours.
This course will address the multidisciplinary aspects of urban environmental quality and its impact on human well-being. It will provide a critical appreciation of the factors which influence health, well-being and quality of life within contemporary urban environments, demonstrate the importance of genomics and health informatics in developing strategies for improving the health and well-being of urban citizens, explore the importance of urban design and the contribution of the development of food smart cities in improving both urban health and livability, and understand the increasingly important role of Information and Communications Technology (ICT) in facilitating delivery of effective and responsive urban health, well-being, and quality of life strategies.

CESC 612. Green Buildings. 3 Hours.
The course will begin by discussing the concepts, viewpoints and fundamentals essential for understanding green building and construction. Discussions will then be focused on how key stakeholders and their future collaborations can begin to incorporate sustainable construction practices for the betterment of the project (new construction and inventory rehabilitation). This will be followed by the evaluation of sustainable construction rating systems (LEED, BREEAM, etc.) and how they can be applied to occupied buildings throughout an urban environment. Modular case studies of sustainable construction projects (individual structures to entire community developments) will be used to illustrate the value, challenges and limitations of this concept. In the end, students will possess an expanded knowledge base needed to help advance sustainable smart cities development.

CESC 614. Smart Cities Technologies. 3 Hours.
This course gives students the opportunity to study emerging smart technologies that can be deployed and integrated together with the aim of improving overall building / city performance. The course provides an overview of technologies that can be used to: sense and measure physical parameters; acquire, process, and analyze various datasets; and make appropriate decisions / gives suitable instructions based on all available information. Specific technologies addressed include Data Acquisition, Telecommunications, Wireless Sensor Networks, and the Internet of Things. The course will also explore and evaluate how these emerging technologies can contribute to various smart cities / buildings priorities, namely Energy Management, Health, Safety, and Security.

CESC 616. Big Data and Smart Cities. 3 Hours.
The world is becoming increasingly digitally interconnected and this instrumentation, data collection, interconnection, storage, and analysis can provide the capacity to radically transform how cities monitor, manage and enhance their environmental quality and livability. This course will provide an introduction to what big data is and how it can contribute to the smarter, more sustainable management of cities. The course will begin by discussing the concepts of big data and the big data revolution, and an overview of the ways in which data can be captured, stored and analyzed. This will be followed by a consideration of how big data can be used by city managers to optimize: their use of physical and digital infrastructures; their sustainable use of natural resources; citizen service delivery; and citizen engagement, participation and urban governance. You will also be introduced to some of the challenges presented by big data, both the technological challenges and the ethical and social implications associated with collecting, storing and using big data. Throughout the course case studies of big data in action will be used to illustrate the value, challenges and limitations of big data in the smarter, more sustainable management of cities.

CESC 618. Research Methods and Project Planning. 3 Hours.
As a student of smart city processes and urban environmental management you need to understand the research process which enables you to take the knowledge and skills which you have learned and apply it to a specific urban sustainability / environmental management issue. This course is not intended to provide a training in research techniques, but rather to make you aware of a wide range of investigative and analytical methods and techniques using examples drawn from the areas of smart city approaches, urban sustainability and environmental management. Both quantitative and qualitative methodologies and primary and secondary data collection will be covered. You will be encouraged to reflect on the research process and its outcomes by critiquing research papers written from methodological standpoints. You will then apply this knowledge to create a viable research proposal for your own Sustainable Smart Cities Masters project. This proposal will require you to identify and justify for your chosen topic: (i) appropriate research questions, (ii) methodologies and data sampling / collection techniques, (iii) ethical and health and safety implications and, (iv) a timetable of action.

CESC 620. Sustainable Smart Cities Research Project. 0 Hours.
This course will develop skills in both research and technical writing in the area of applying and/or evaluating sustainable smart cities processes and policies to a specific urban environmental or sustainability issue. The research proposal produced as part of the Research Methods and Project Planning course will be implemented. This will involve further research into the relevant background and context of a chosen project topic, implementation and evaluation of appropriate methods for collecting and analyzing data, observations and information, the ability to present findings clearly and concisely, and appreciate their significance in relation to the smart city and sustainable urban management agendas. Research should be at the forefront of student's chosen sustainable smart cities research topic and be at a level similar to that required for acceptance and presentation at a national level conference or symposium on smart and sustainable cities. For students in relevant employment, projects may be carried out in your place of work subject to discussions between you, your employer/line manager, and your project supervisor.

CESE - Structural Engineering Courses

CESE 653. Wood and Masonry Design. 3 Hours.
Design of wood structures to meet the requirements of the National Design Specification including beams, columns, and shear walls. Design and detailing of masonry structures. Nomenclature, properties, and specifications for components. Design of assemblages and masonry elements in simple masonry structures.

CESE 656. Advanced Mechanics of Materials for Structural Engineering. 3 Hours.
This course will review the basic fundamentals of mechanics of materials and will extend the concepts to include 3-dimensional stress and strain, plastic behavior, energy methods, nonlinear behavior, fatigue and fracture, rectangular linear elastic plates, indeterminate structures and stability.

CESE 657. Advanced Design of Steel Structures. 3 Hours.
Design of major components in steel-framed buildings, including composite beams and slabs, beam-columns, moments connections, bracing members, bracing connections, and column base plates.

CESE 659. Advanced Reinforced Concrete. 3 Hours.
In this course students will study the behavior and design of continuous reinforced concrete structures submitted to gravity and lateral loads. The study will include biaxial loading of columns, continuous one-way beams and slabs, two-way floor systems, and torsion loading.

CESE 660. Prestressed Concrete Behavior and Design. 3 Hours.
The course will explore the characteristics and design of pre-stressed concrete structural components to include elastic and ultimate strength analyses for flexural, shear, torsion, deflection, strand bond, and pre-stress loss.

CESE 662. Advanced Structural Analysis. 3 Hours.
This course explores the structural analysis of indeterminate structures using classical and approximate methods and structural analysis software. Specific emphasis is placed on the determination of forces in typical multistory, rectilinear frames subject to gravity and lateral loads. In addition to first order analysis, the course included analysis for second order effects and plastic analysis.

CESE 664. Bridge Engineering. 3 Hours.
This course includes the study of bridge loads, including moving load analysis; methods for approximate structural analysis, preliminary bridge design methods, and the structural design of bridge decks and girders.

CESE 665. Structural Dynamics and Earthquake Engineering. 3 Hours.
This course includes the study of earthquake-induced vibrations of single and multi-degree-of-freedom systems, such as single and multistory frames. Emphasis will be placed on structural steel and reinforced concrete building frames. Response spectrum analysis will be investigated as well as building codes and static and dynamic lateral load force procedures.

CESE 676. Design of Structural Steel Connections. 3 Hours.
Design of bolted and welded steel connections, including shear, moment and brace connections using the AISC Specifications requirements and fundamental engineering principals. Design procedures will be discussed for various structural steel connections. The background and limitations of the design procedures will be reviewed and practical solutions will be provided.

CESE 690. Special Topics (Area). 1-3 Hour.
Special Topics (Area).

CESE 698. Non Thesis Research. 3 Hours.
No syllabus for non-thesis research hours.

Electrical and Computer Engineering

Department	Electrical and Computer Engineering
Website	https://www.uab.edu/engineering/ece/
Director	Leon Jololian, PhD
Phone	(205)934-8440
E-mail	leon@uab.edu

The Department of Electrical and Computer Engineering offers a Master of Science in Electrical and Computer Engineering (MSECE) degree and a PhD in Computer Engineering shared with the University of Alabama at Huntsville (UAH) Electrical and Computer Engineering Department.

Electrical Engineering

Admission Requirements

Requirements for admission to the Electrical and Computer Engineering Master's degree program include the following:

1. A bachelor's degree in an accredited electrical engineering, computer engineering, electrical and computer engineering or a bachelor's degree acceptable to the graduate faculty in the Department of Electrical and Computer Engineering. Students not having a bachelor's degree in electrical engineering, computer engineering, electrical and computer engineering may be required to complete prerequisite courses based on their prior coursework and their plan of study, which will be defined at the time of admission.
2. A 3.0 or higher on a 4.0 scale;
3. Three letters of recommendation concerning the applicant's previous academic and professional work;
4. International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details
5. Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School (detailed instructions are included during the online application process)

Additional Information

Deadline for Entry Term(s)	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office	Seven days before the start of term

Computer Engineering

Program Information

The PhD degree prepares students for professional and research careers in industry and academia. The PhD in Computer Engineering is awarded by UAB and is offered through a program shared with the University of Alabama in Huntsville (UAH), allowing both UAB and UAH to contribute to the program.

Admission Requirements

Requirements for admission to the PhD program include the following:

1. A bachelor’s degree in an accredited electrical or computer engineering program or a bachelor’s degree in a related program acceptable to the graduate faculty in Electrical and Computer Engineering; students not having a bachelor’s degree in electrical or computer engineering may be required to complete prerequisite courses, which will be defined at the time of admission.
2. An overall GPA of at least 3.0 on a 4.0 point scale, or at least 3.0 for the last 60 semester hours completed; and
3. Three letters of recommendation concerning the applicant’s previous academic and professional work.
4. International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details;
5. Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School (detailed instructions are included during the online application process);

Financial Support

Fellowships and/or assistantships may be available for well-qualified students admitted into the PhD program. In order to be considered for financial aid for the coming academic year, the completed application materials must usually be received at UAB by April 1.

There are a number of minority fellowships available through the Graduate School. Contact the UAB Graduate School directly for further information.

Additional Information

Deadline for Entry Term(s)	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office	Seven days before the start of term

Master of Science in Electrical and Computer Engineering

The Master of Science in Electrical and Computer Engineering (MSECE) prepares students for a professional career in industry or entry into a doctoral program or professional school. The MSECE program builds upon the broad foundation provided by a Bachelor of Science in Electrical Engineering by supplying depth in specific area of electrical and computer engineering through advanced coursework and a thesis or project experience.

Additional Academic Policies

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined credit hours of Special Topics and/or Independent Study courses will be applied to the degree without appeal to and approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

UAB offers Accelerated Bachelor’s / Master’s and Early Acceptance. To learn more about these programs, including requirements and how to apply, visit the Graduate School’s ALO page.

Fast Track Master of Science in Electrical and Computer Engineering

UAB Electrical and Computer Engineering undergraduate students with significant research experience may begin work toward their MSECE degree while still undergraduates. To be considered for this program, students must have junior-level standing (more than 60 hours completed), have completed at least 3 of the required junior-level ECE courses, and have a UAB GPA of at least 3.5. Applicants are expected to have already selected a research mentor for their graduate studies, which will typically be a continuation of their undergraduate research. Application to the program is through the normal UAB Graduate School application portal. One of the letters of recommendation must be from the research mentor. Once enrolled in the program, before completing their undergraduate degree, students may take graduate courses that will be applied to the MSECE degree. Note that coursework may not be applied toward both the undergraduate and graduate degrees. Students may pursue either the Plan I or Plan II MSECE option.

Accelerated Bachelor's / Master's

Electrical and Computer Engineering offers an accelerated Bachelor's / Master's (ABM) option for high-achieving undergraduate students pursuing a BS degree in Electrical and Computer Engineering at UAB. The following courses are approved for shared credit for students pursuing an ABM in ECE. A successful graduate of ABM will earn both a bachelor's degree and a master's degree in ECE from the University of Alabama at Birmingham in an accelerated timeframe compared to the independent completion of the two degrees.

Graduate courses allowed for credit sharing are: EE 512, EE 518, EE 523, EE 526, EE 527, EE 531, EE 532, EE 533, EE 534, EE 537, EE 538, EE 544, EE 547,EE 548, EE 552, EE 558, EE 561, EE 571, EE 572, EE 573, EE 585, EE 634, EE 654, EE 655, EE 656, EE 658.

Plan I (Thesis Option)

The Plan I Master's degree requires completion of at least 33 credit hours of graduate work.

- 18 credit hours of graduate-level courses appropriate to the student's area of technical specialization
- 6 credit hours of courses having a mathematical emphasis
- 9 credit hours of EE 699 Thesis Research

Students must be admitted to candidacy prior to enrolling in EE 699. A student is eligible for admission to candidacy after (1) a written thesis proposal has been orally presented to the committee and approved and (2) completion of Responsible Conduct of Research (RCR)

training. Admission to candidacy must take place at least one semester before the student may graduate.

Plan II (Non-Thesis Option)

The Plan II Master's degree requires completion of at least 33 semester hours of graduate work.

- 24 credit hours of graduate-level courses appropriate to the student's area of technical and professional specialization;
- 6 credit hours of courses having a mathematical emphasis;
- 3 credit hours of EE 697 Graduate Project

The PhD degree prepares students for professional and research careers in industry and academia. The PhD in Computer Engineering is awarded by UAB and is offered through a program shared with the University of Alabama in Huntsville (UAH), allowing both UAB and UAH to contribute to the program.

Committee and Candidacy Requirements

In addition to completing coursework requirements (see below), doctoral students must form a Graduate Dissertation Committee consisting of at least five faculty members, including the primary research mentor. At least two committee members must have a primary appointment at UAB in the Department of Electrical and Computer Engineering and one must have a primary appointment at UAH in the Electrical and Computer Engineering Department.

A comprehensive examination is required of all doctoral candidates. This exam is given after:

- All coursework is completed,
- Successful completion of GRD 717 Principles of Scientific Integrity, and
- The student's Graduate Committee, which consists of faculty representatives from both campuses, deems the student to have adequate preparation in the major and minor fields of study.

The examination is conducted by the Graduate Committee and administered on the resident campus. The examination consists of a written part and an oral part. The student presents a dissertation proposal during the oral portion of the examination. The comprehensive examination may only be taken twice.

After successfully passing the exam and defense, the graduate student will then enter into doctoral candidacy. Doctoral candidates must complete a minimum of 24 hours of dissertation research and then develop a dissertation for review by the dissertation committee. The candidate must also present an oral public defense of their dissertation. This must take place at least two semesters before the student may graduate. If the defense is successful, the student then has 10 working days to revise the dissertation and submit its approved form to the Graduate School by the published deadline.

Additional Academic Policies

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined credit hours of Special Topics and/or Independent Study courses will be applied to the Computer Engineering PhD without appeal to and approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

Post Bachelor Requirements

Students entering the PhD program with a bachelor degree are required to complete at least 48 credit hours of coursework followed by 24 credit hours of dissertation research.

- 18 credit hours of approved coursework in computer engineering
- 12 credit hours of approved coursework in electrical or computer engineering
- 9 credit hours of approved coursework in mathematics, theoretical or formal methods as related to computer engineering
- 6 credit hours of approved coursework in fields that support the dissertation research
- 3 credit hours of GRD 717 Principles of Scientific Integrity
- 24 credit hours of EE 799 Dissertation Research

Post Master Coursework Requirements

Students entering the PhD program with a master degree are required to complete at least 27 credit hours of coursework followed by 24 credit hours of dissertation research.

- 9 credit hours of approved coursework in computer engineering
- 6 credit hours of approved coursework in electrical or computer engineering
- 6 credit hours of approved coursework in mathematics, theoretical or formal methods as related to computer engineering
- 3 credit hours of approved coursework in fields that support the dissertation research

- 3 credit hours of GRD 717 Principles of Scientific Integrity
- 24 credit hours of EE 799 Dissertation Research

Courses

EE 512. Practical Computer Vision. 3 Hours.
This course covers the fundamentals and application of image analysis. Topics include: image pre-processing, detection, segmentation, classification and recognition, visual tracking, and deep learning.

EE 518. Wireless Communications. 3 Hours.
This course covers the principles and current applications of wireless technology. Topics include propagation models, modulation, multiple access, and channel and signal coding. Applications of wireless for cellular and Internet of Things (IoT) will also be covered.

EE 521. Communication Systems. 3 Hours.
This course covers the mathematics of modulation and demodulation of radio signals to transmit and receive information. It focuses on various forms of amplitude modulation (AM), phase and frequency modulation (FM). This course builds on the mathematics from signals and systems course to study how to represent and manipulate these signals in both time and frequency domain. It also studies the effects of sampling, and how these systems operate in the presence of noise.

EE 523. Digital Signal Processing. 3 Hours.
This course covers the theory and practice of using computers to process and analyze signals. The topics include: digital filter analysis and design; Fast Fourier Transform (FFT) algorithms; applications of digital signal processing in engineering problems such as data acquisition and control.

EE 526. Control Systems. 3 Hours.
This course covers modeling and control of mechanisms or circuits to satisfy stability and performance criteria. Topics include: theory of linear feedback control systems using complex frequency techniques, block diagram manipulation, performance measures, stability, analysis and design using root locus, and Z-transform methods.

EE 527. Industrial Control. 3 Hours.
This course covers power control devices and applications, relay logic and translation to other forms, programmable logic controllers (PLCs), proportional-integral-derivative (PID) and other methods for process control, modern laboratory instrumentation, and human-machine interface (HMI) software.

EE 531. Analog Integrated Electronics. 4 Hours.
This course covers advanced analysis and design using op-amps, differential amplifier, half-circuit analysis, error analysis and compensation. Applications include signal conditioning for instrumentation, instrumentation amplifiers, nonlinear and computational circuits, analog filter design, voltage regulator design, and oscillators, circuit configurations for A-to-D and D-to-A conversion methods. Laboratory exercises emphasize design techniques for projects in areas such as Internet-of-Things (IoT).

EE 532. Introduction to Computer Networking. 3 Hours.
This course covers the fundamentals of modern computer networks including current applications such as Internet of Things (IoT). Topics include: hardware and software level network protocols, network architecture and topology including WANs and LANs, client-server relationships, distributed computing, data transfer, security, virtualization of hardware, multi-tier network configuration examples, and certifications will be addressed.
Prerequisites: EE 134 [Min Grade: C] and EE 210 [Min Grade: C]

EE 533. Engineering Software Solutions. 3 Hours.
This course covers the fundamentals of software design, architecture, and implementation for future software engineers. Topics include: customer-focused requirements gathering, project planning, team tools, architectural patterns, environment and component selection, quality assurance, sustainability, and versioning. Various development methodologies are discussed with a project demonstrating at least one release cycle.

EE 534. Power Semiconductor Electronics. 3 Hours.
This course covers the fundamentals of power electronics such as principles of static power conversions, basic power converter architectures, power semiconductor switches, steady-state equivalent circuit modeling, DC transformer model, basic AC equivalent circuit modeling, linearization and perturbation. Pulse width modulation and controller design, circuit design considerations, and applications of power electronics. The course project emphasizes computer-aided analysis and design of power electronic circuits.

EE 537. Introduction to Embedded Systems. 3 Hours.
This course provides an applied introduction to the design of embedded systems, including hardware and software aspects. Topics include: various embedded hardware platforms, interfacing industrial bus systems, sensors, actuators, low-power wireless communication, and the application of the Internet of Things (IoT).

EE 538. Computer Architecture. 3 Hours.
Advanced microprocessor topics include a comparison of advanced contemporary microprocessors, cache design, pipelining, superscalar architecture, design of control units, microcoding, and parallel processors. Basic knowledge of microprocessors is recommended.

EE 544. Real-Time Process & Protocols. 3 Hours.
This course covers hands-on laboratory topics in real-time computer systems, such as algorithms, state-machine implementations, communication protocols, instrumentation, and hardware interfaces.

EE 547. Internet/Intranet Application Development. 3 Hours.
This course covers development of software models and applications using Internet/Intranet technologies. Topics include: web client-server relationships, multi-tier design models, scripting and validation, basic TCP/IP networking, separation of concerns, markup and data description languages. Projects will allow the opportunity for the use of a range of tools and development platforms.
Prerequisites: EE 233 [Min Grade: C]

EE 548. Software Engineering Projects. 3 Hours.
This course covers practical applications of software engineering including the development of applications for the Internet of Things (IoT). Topics include: requirements gathering, design matrices, environment selection, relevant architectural patterns, networking basics, databases, service endpoints, embedded systems selection and security. Projects with a software emphasis will be utilized to demonstrate the principles of IoT applications.
Prerequisites: EE 333 [Min Grade: C]

EE 552. Digital Systems Design. 3 Hours.
This course covers the design of customized complex digital systems using Field Programmable Gate Array (FPGA) based platforms, using modern design tools for simulation, synthesis, and implementation. Topics include hardware design and development languages such as Verilog or VHDL.

EE 558. Medical Instrumentation. 3 Hours.
This course covers the fundamental operating principles, applications, safety, and design of electronic instrumentation used in the measurement of physiological parameters.

EE 561. Machinery II. 3 Hours.
Physical principles of DC machines. Mathematical analysis of generator designs using equivalent circuits and magnetization curves. Calculation of motor speed, torque, power, efficiency, and starting requirements. Solid-state speed control systems.

EE 563. Medical Image Analysis. 3 Hours.
A lab-based introduction to processing, analysis, and display techniques for medical imaging.

EE 567. Brain Machine Interface. 3 Hours.
This course explores the brain-machine interfaces, particularly the technologies that directly stimulate and/or record neural activity. This course is divided into three major components: 1) neuroscience and electrode interfaces, 2) brain recording and stimulating front-end circuits, and 3) circuit modeling, simulation, and optimization.

EE 571. Power Systems I. 3 Hours.
Components of power systems. Performance of modern interconnected power system under normal and abnormal conditions. Calculation of inductive and capacitive reactances of three-phase transmission lines in a steady state.

EE 572. Power Systems II. 3 Hours.
Modeling of generators, transformers, and transmission lines for system studies. Introduction to symmetrical components. Calculation of short-circuit currents due to balanced and unbalanced faults. Determination of interrupting ratings of circuit breakers. Transient stability of power systems. Derivation of swing equation and solution by numerical method. Equal area criterion. A power system design project is required.

EE 573. Protective Relaying of Power Systems. 3 Hours.
Operating principles of protective relays. Protection of transmission lines, generators, motors, transformers, and buses.

EE 585. Engineering Operations. 3 Hours.
This course covers the principles and standard of engineering design from ideation to final design. Topics include: product development process, problem definition and need identification, embodiment and detail design, design for specific criterion, modeling and cost evaluation. Emphasis is placed on ethics and civil responsibilities in design including environmental, social issues, liability, sustainability and reliability through the lens of engineering design.

EE 590. Special Topics in Electrical and Computer Engineering. 1-3 Hour.
Special Topic in Electrical or Computer Engineering.

EE 591. Individual Study in Electrical and Computer Engineering. 1-6 Hour.
Individual Study in Electrical Engineering.

EE 601. Electrical and Computer Engineering Seminar. 1-3 Hour.
This course consists of research presentations delivered by faculty, research assistants, and invited guests in various state-of-the-art and popular topics related to Electrical and Computer Engineering.

EE 610. Technical Communication for Engineers. 3 Hours.
A workshop-oriented course providing students with the opportunity to produce technical memoranda, a proposal, and a conference and/or refereed journal paper and to make oral presentations related to these work products utilizing appropriate software presentation aids.

EE 616. Design of CMOS Analog Integrated Circuits. 3 Hours.
This course will cover basic building blocks of CMOS analog VLSI design, MOSFET theory, short channel device and nonlinear effects, current mirrors, current-reference generator, operational transconductance amplifier, switched capacitor architecture, analog-to-digital converter and digital-to-analog converter. Students will be required to develop a computer aided design, simulation, and chip layout of an analog integrated circuit design project. Fundamental knowledge of electronics is required.

EE 621. Random Variables and Processes. 3 Hours.
Theory underlying analysis and design of communication, stochastic control, data gathering, and data analysis systems.
Prerequisites: EE 421 [Min Grade: C]

EE 622. Advanced Communication Theory. 3 Hours.
Analysis of the performance of analog modulation techniques in presence of noise.
Prerequisites: EE 621 [Min Grade: C]

EE 623. Computer Vision. 3 Hours.
Advanced topics in computer vision: image segmentation, registration, and visual tracking; applications of deep learning to image analysis.

EE 624. Digital Communications. 3 Hours.
Design and analysis of digital communications modulation techniques and systems and their performance in the presence of noise.
Prerequisites: EE 622 [Min Grade: C]

EE 625. Information Theory and Coding. 3 Hours.
Channel models and block codes, block code ensemble performance analysis, convolutional codes and ensemble performance, sequential decoding of convolutional codes.
Prerequisites: EE 621 [Min Grade: C]

EE 626. Digital Image Processing. 3 Hours.
The course covers topics in image transformations, enhancement, restoration, compression, and representation. Introduction to image segmentation.

EE 627. Wireless Communications. 3 Hours.
Wireless communication system topics such as propagation, modulation techniques, multiple access techniques, channel coding, speech and video coding, and wireless computer networks.

EE 630. Short-Range Wireless Systems. 3 Hours.
This course covers the short-range wireless power transmission (WPT), wireless data communication, and wireless sensor technologies. It emphasizes fundamental understanding of the principles and design procedure of short-range wireless power/data transfer systems as well as the various parameters involved in the optimization of wireless power/data transmission systems.

EE 632. Introduction to Computer Networking. 3 Hours.
Computer networking fundamentals. Layered network model and correspondence to real systems. Discussion of Ethernet, Token Ring, TCP/IP, LAN, and other protocols. Exploration of the Internet and similar systems. Network application models. Simulation of networks.

EE 633. Experiments in Computer Networking. 3 Hours.
Detailed exploration of particular issues in network protocols and network application models. Development of a series of programs to explore the details of network protocols and network application models.

EE 634. Introduction to Neural Networks. 3 Hours.
Artificial neural network topologies and training algorithms with an emphasis on back propagation. Deep learning with Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), applications and limitations of neural networks, and designing networks specific uses.

EE 636. Advanced Digital Design. 3 Hours.
This course covers the design of Complex Programmable Logic Devices (CPLDs) and Field Programmable Gate Arrays (FPGAs). Topics include the design, simulation, and testing of digital systems using a hardware description language and FPGA/CPLD development boards with programmable logic devices.

EE 637. Design of Modern Computer with Digital Integrated Circuits. 3 Hours.
This course covers the design of advanced digital circuits with VLSI components. Topics include synthesis, design, simulation, and testing of advanced digital circuits using a hardware description language and FPGA/CPLD development boards with programmable logic devices. Design examples: switching networks, graphics engine, DSP, Internet of Things (IoT) controller, and programmable logic controller (PLC).

EE 638. Neural Time Series Data Analysis. 3 Hours.
This course covers the theory and practice of analyzing brain signals. Students will learn about conceptual, mathematical and implementational (via MATLAB programming) aspects of time-, frequency- and synchronization-based analyses of magnetoencephalography (MEG), electroencephalography (EEG), and local field potential (LFP) recordings from humans and nonhuman animals.

EE 639. Embedded Systems. 3 Hours.
This course covers both hardware and software trends in advanced embedded system design, including artificial intelligence (AI) and optimized hardware platforms for machine learning (ML). The fundamental algorithms of AI and ML are discussed. Various process acceleration techniques for improving the computational efficiency of ML kernels are implemented on FPGA/CPLD development boards and FPGA/CPLD chips.

EE 640. Object-Oriented Design. 3 Hours.
This course provides in-depth coverage of object-oriented design principles and methodologies. Topics include object-oriented design frameworks, use-cases, class-responsibility-collaboration (CRC), design patterns, and software reuse. Knowledge of an object-oriented language is recommended.

EE 641. Modern Control Theory. 3 Hours.
This course covers state variable models for continuous-time and discrete time systems, state feedback and pole placement, and state estimation. Knowledge of basic control systems is recommended.

EE 642. Intelligent Systems. 3 Hours.
This course covers the organization and characteristics of intelligent systems, optimization, evolutionary algorithms, neural networks, fuzzy logic algorithms, and intelligent control.

EE 643. Numerical Methods in Engineering. 3 Hours.
This course covers the theory and practice of numerical methods for a broad spectrum of engineering applications and data analyses. Topics include numerical calculus, linear algebra, and optimization. Students will be exposed to modern topics such as convolutional neural networks, compressed sensing, eigenfaces, stability, principal component analysis, k-means clustering, image segmentation, detection of a signal in the noise, and function fitting. This course provides hands-on practical experience with programming numerical analysis algorithms.

EE 650. Software Engineering. 3 Hours.
This course covers the engineering approach to developing software solutions to real-world problems. Topics include an overview of Software Engineering, requirements elicitation, design, implementation, and an overview of software development methods.

EE 651. Software Engineering Large Systems - I. 3 Hours.
This course covers advanced integrated software systems development methods. Adaptive and prescriptive software systems development methods are covered with an in-depth exploration through team projects using current software development methods.

EE 654. Mobile Computing. 3 Hours.
This course covers the fundamentals and advanced concepts in mobile computing. Develop user interface, application logic, and back-end services, using advanced integrated development environments. Individual and team projects. Programming required.

EE 655. Cloud Computing. 3 Hours.
This course covers fundamental and advanced concepts in cloud computing, including evaluation of current market offerings. Students will also design and implement systems integrating multiple cloud computing services.

EE 656. Introduction to Big Data Analytics. 3 Hours.
This course covers an introduction to the field of big data analytics, including technologies, challenges, architecture, and hypothesis testing.

EE 658. Machine Learning in Engineering. 3 Hours.
This course covers techniques for developing solutions to complex problems in different engineering domains without having to explicitly program the computers. Topics include supervised and unsupervised learning, classification and regression, support vector machines (SVM), boosting, and artificial neural networks.

EE 660. Medical Signal Processing. 3 Hours.
This course covers the theory and practice of processing and analyzing single-channel and multiple-channel medical signals. The topics include linear and nonlinear filtering, cross-estimation, autoregressive and spectral modeling, entropy, principal component analysis (PCA), classification, and clustering methods.

EE 667. Advanced Brain Machine Interface. 3 Hours.
This course consists of four major parts: 1) neuroscience and interfaces, 2) brain imaging technologies, 3) front-end circuit design, 4) power/data links and graphical user interface, and 5) circuit, wireless link, and safety simulating software-learning parts.

EE 682. Electromagnetic Field Theory I. 3 Hours.
This course covers the modeling of materials and environments through the simulation of electromagnetic fields. It includes a wide variety of applications, including biomedical and the Internet of Things (IoT). Topics include boundary-value problems and scattering.

EE 690. Special Topics in (Area). 1-6 Hour.
Special topics selected by faculty for master's students.

EE 691. Individual Study in (Area). 1-6 Hour.
Individual study selected by faculty for master's students.

EE 697. Graduate Project. 3 Hours.
Graduate project for Plan II Masters students.

EE 698. Non-Thesis Research. 1-12 Hour.
Individual research in selected area by faculty for master's students.

EE 699. Thesis Research. 1-12 Hour.
Thesis research.
Prerequisites: GAC M

EE 701. Electrical and Computer Engineering Seminar. 1-3 Hour.
This course consists of research presentations delivered by faculty, research assistants, and invited guests in various state-of-the-art and popular topics related to Electrical and Computer Engineering.

EE 710. Technical Communication for Engineers. 3 Hours.
A workshop-oriented course providing students with the opportunity to produce technical memoranda, a proposal, and a conference and/or refereed journal paper and to make oral presentations related to these work products utilizing appropriate software presentation aids.

EE 716. Design of CMOS Analog Integrated Circuits. 3 Hours.
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EE 723. Computer Vision. 3 Hours.
Advanced topics in computer vision: Image segmentation, registration, and visual tracking; applications of deep learning to image analysis.

EE 724. Digital Communications. 3 Hours.
Design and analysis of digital communications modulation techniques and systems and their performance in the presence of noise.
Prerequisites: EE 622 [Min Grade: C]

EE 725. Information Theory and Coding. 3 Hours.
Channel models and block codes, block code ensemble performance analysis, convolutional codes and ensemble performance, sequential decoding of convolutional codes.
Prerequisites: EE 621 [Min Grade: C]

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Artificial neural network topologies and training algorithms with an emphasis on back propagation. Deep learning with Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), applications and limitations of neural networks, and designing networks for specific uses.

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This course covers the organization and characteristics of intelligent systems, optimization, evolutionary algorithms, neural networks, fuzzy logic algorithms, and intelligent control.

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This course covers the theory and practice of numerical methods for a broad spectrum of engineering applications and data analyses. Topics include numerical calculus, linear algebra, and optimization. Students will be exposed to modern topics such as convolutional neural networks, compressed sensing, eigenfaces, stability, principal component analysis, k-means clustering, image segmentation with active contours, detection of a signal in the noise, and function fitting. This course provides hands-on practical experience with programming numerical analysis algorithms.

EE 750. Software Engineering. 3 Hours.
This course covers the engineering approach to developing software solutions to real-world problems. Topics include an overview of Software Engineering, requirements elicitation, design, implementation, and an overview of software development methods.

EE 751. Software Engineering Large Systems - I. 3 Hours.
This course covers advanced integrated software systems development methods. Adaptive and prescriptive software systems development methods are covered with an in-depth exploration through team projects using current software development methods.

EE 752. Software Engineering Large Systems - II. 3 Hours.
This course covers software development in enterprise environments using Dev-Ops practices such as continuous integration and delivery.

EE 754. Mobile Computing. 3 Hours.
This course covers the fundamentals and advanced concepts in mobile computing. Develop user interface, application logic, and backend services, using advanced integrated development environments. Individual and team projects. Programming required.

EE 755. Cloud Computing. 3 Hours.
This course covers fundamental and advanced concepts in cloud computing, including evaluation of current market offerings. Students will also design and implement systems integrating multiple cloud computing services.

EE 756. Introduction to Big Data Analytics. 3 Hours.
This course covers an introduction to the field of big data analytics, including technologies, challenges, architecture, and hypothesis testing.

EE 758. Machine Learning in Engineering. 3 Hours.
This course covers techniques for developing solutions to complex problems in different engineering domains without having to explicitly program the computers. Topics include supervised and unsupervised learning, classification and regression, support vector machines(SVM), boosting, and artificial neural networks.

EE 760. Medical Signal Processing. 3 Hours.
This course covers the theory and practice of processing and analyzing single-channel and multiple-channel medical signals. The topics include linear and nonlinear filtering, cross-estimation, autoregressive and spectral modeling, entropy, principal component analysis (PCA), classification, and clustering methods.

EE 767. Advanced Brain Machine Interface. 3 Hours.
This course consists of four major parts: 1) neuroscience interfaces, 2) brain imaging technologies, 3) front-end circuit design, 4) power/data links and graphical user interface, and 5) circuit, wireless link, and safety simulating software-learning parts.

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This course covers the modeling of materials and environments through the simulation of electromagnetic fields. It includes a wide variety of applications, including biomedical and the Internet of Things (IoT). Topics include boundary-value problems and scattering.

EE 790. Special Topics in (Area). 1-6 Hour.
Special topics selected by faculty for PhD students.

EE 791. Individual Study in (Area). 1-6 Hour.
Individual study in an area selected by faculty for PhD students.

EE 798. Non-Dissertation Research. 1-12 Hour.
Individual research in selected problem by faculty for PhD students.

EE 799. Dissertation Research. 1-12 Hour.
PhD dissertation research.
Prerequisites: GAC Z

Electrical and Computer Engineering

Degree Offered	Master of Science in Electrical and Computer Engineering
Website	http://www.uab.edu/engineering/ece/graduate
Director	Leon Jololian, PhD
Phone	(205) 934-8440
E-mail	leon@uab.edu

Admission Requirements

Requirements for admission to the Electrical and Computer Engineering Master's degree program include the following:

1. A bachelor's degree in an accredited electrical engineering, computer engineering, electrical and computer engineering or a bachelor's degree acceptable to the graduate faculty in the Department of Electrical and Computer Engineering. Students not having a bachelor's degree in electrical engineering, computer engineering, electrical and computer engineering may be required to complete prerequisite courses based on their prior coursework and their plan of study, which will be defined at the time of admission.
2. A 3.0 or higher on a 4.0 scale;
3. Three letters of recommendation concerning the applicant's previous academic and professional work;
4. International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details
5. Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School (detailed instructions are included during the online application process)

Additional Information

Deadline for Entry Term(s)	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office	Seven days before the term begins

Master of Science in Electrical and Computer Engineering

The Master of Science in Electrical and Computer Engineering (MSECE) prepares students for a professional career in industry or entry into a doctoral program or professional school. The MSECE program

builds upon the broad foundation provided by a Bachelor of Science in Electrical Engineering by supplying depth in specific area of electrical and computer engineering through advanced coursework and a thesis or project experience.

Additional Academic Policies

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined credit hours of Special Topics and/or Independent Study courses will be applied to the degree without appeal to and approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

Fast Track Master of Science in Electrical and Computer Engineering, add

UAB Electrical and Computer Engineering undergraduate students with significant research experience may begin work toward their MSECE degree while still undergraduates. To be considered for this program, students must have junior-level standing (more than 60 hours completed), have completed at least 3 of the required junior-level ECE courses, and have a UAB GPA of at least 3.5. Applicants are expected to have already selected a research mentor for their graduate studies, which will typically be a continuation of their undergraduate research. Application to the program is through the normal UAB Graduate School application portal. One of the letters of recommendation must be from the research mentor. Once enrolled in the program, before completing their undergraduate degree, students may take graduate courses that will be applied to the MSECE degree. Note that coursework may not be applied toward both the undergraduate and graduate degrees. Students may pursue either the Plan I or Plan II MSECE option.

Plan I (Thesis Option)

The Plan I Master's degree requires completion of at least 33 credit hours of graduate work.

- 18 credit hours of graduate-level courses appropriate to the student's area of technical specialization
- 6 credit hours of courses having a mathematical emphasis;
- 9 credit hours of EE 699 Thesis Research

Students must be admitted to candidacy prior to enrolling in EE 699. A student is eligible for admission to candidacy after (1) a written thesis proposal has been orally presented to the committee and approved and (2) completion of Responsible Conduct of Research (RCR) training. Admission to candidacy must take place at least one semester before the student may graduate.

Plan II (Non-Thesis Option)

The Plan II Master's degree requires completion of at least 33 semester hours of graduate work.

- 24 credit hours of graduate-level courses appropriate to the student's area of technical and professional specialization;
- 6 credit hours of courses having a mathematical emphasis;
- 3 credit hours of EE 697 Graduate Project

Courses

EE 512. Practical Computer Vision. 3 Hours.
This course covers the fundamentals and application of image analysis. Topics include: image pre-processing, detection, segmentation, classification and recognition, visual tracking, and deep learning.

EE 518. Wireless Communications. 3 Hours.
This course covers the principles and current applications of wireless technology. Topics include propagation models, modulation, multiple access, and channel and signal coding. Applications of wireless for cellular and Internet of Things (IoT) will also be covered.

EE 521. Communication Systems. 3 Hours.
This course covers the mathematics of modulation and demodulation of radio signals to transmit and receive information. It focuses on various forms of amplitude modulation (AM), phase and frequency modulation (FM). This course builds on the mathematics from signals and systems course to study how to represent and manipulate these signals in both time and frequency domain. It also studies the effects of sampling, and how these systems operate in the presence of noise.

EE 523. Digital Signal Processing. 3 Hours.
This course covers the theory and practice of using computers to process and analyze signals. The topics include: digital filter analysis and design; Fast Fourier Transform (FFT) algorithms; applications of digital signal processing in engineering problems such as data acquisition and control.

EE 526. Control Systems. 3 Hours.
This course covers modeling and control of mechanisms or circuits to satisfy stability and performance criteria. Topics include: theory of linear feedback control systems using complex frequency techniques, block diagram manipulation, performance measures, stability, analysis and design using root locus, and Z-transform methods.

EE 527. Industrial Control. 3 Hours.
This course covers power control devices and applications, relay logic and translation to other forms, programmable logic controllers (PLCs), proportional-integral-derivative (PID) and other methods for process control, modern laboratory instrumentation, and human-machine interface (HMI) software.

EE 531. Analog Integrated Electronics. 4 Hours.
This course covers advanced analysis and design using op-amps, differential amplifier, half-circuit analysis, error analysis and compensation. Applications include signal conditioning for instrumentation, instrumentation amplifiers, nonlinear and computational circuits, analog filter design, voltage regulator design, and oscillators, circuit configurations for A-to-D and D-to-A conversion methods. Laboratory exercises emphasize design techniques for projects in areas such as Internet-of-Things (IoT).

EE 532. Introduction to Computer Networking. 3 Hours.
This course covers the fundamentals of modern computer networks including current applications such as Internet of Things (IoT). Topics include: hardware and software level network protocols, network architecture and topology including WANs and LANs, client-server relationships, distributed computing, data transfer, security, virtualization of hardware, multi-tier network configuration examples, and certifications will be addressed.
Prerequisites: EE 134 [Min Grade: C] and EE 210 [Min Grade: C]

EE 533. Engineering Software Solutions. 3 Hours.
This course covers the fundamentals of software design, architecture, and implementation for future software engineers. Topics include: customer-focused requirements gathering, project planning, team tools, architectural patterns, environment and component selection, quality assurance, sustainability, and versioning. Various development methodologies are discussed with a project demonstrating at least one release cycle.

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A workshop-oriented course providing students with the opportunity to produce technical memoranda, a proposal, and a conference and/or refereed journal paper and to make oral presentations related to these work products utilizing appropriate software presentation aids.

EE 616. Design of CMOS Analog Integrated Circuits. 3 Hours.
This course will cover basic building blocks of CMOS analog VLSI design, MOSFET theory, short channel device and nonlinear effects, current mirrors, current-reference generator, operational transconductance amplifier, switched capacitor architecture, analog-to-digital converter and digital-to-analog converter. Students will be required to develop a computer aided design, simulation, and chip layout of an analog integrated circuit design project. Fundamental knowledge of electronics is required.

EE 621. Random Variables and Processes. 3 Hours.
Theory underlying analysis and design of communication, stochastic control, data gathering, and data analysis systems.
Prerequisites: EE 421 [Min Grade: C]

EE 622. Advanced Communication Theory. 3 Hours.
Analysis of the performance of analog modulation techniques in presence of noise.
Prerequisites: EE 621 [Min Grade: C]

EE 623. Computer Vision. 3 Hours.
Advanced topics in computer vision: image segmentation, registration, and visual tracking; applications of deep learning to image analysis.

EE 624. Digital Communications. 3 Hours.
Design and analysis of digital communications modulation techniques and systems and their performance in the presence of noise.
Prerequisites: EE 622 [Min Grade: C]

EE 625. Information Theory and Coding. 3 Hours.
Channel models and block codes, block code ensemble performance analysis, convolutional codes and ensemble performance, sequential decoding of convolutional codes.
Prerequisites: EE 621 [Min Grade: C]

EE 626. Digital Image Processing. 3 Hours.
The course covers topics in image transformations, enhancement, restoration, compression, and representation. Introduction to image segmentation.

EE 627. Wireless Communications. 3 Hours.
Wireless communication system topics such as propagation, modulation techniques, multiple access techniques, channel coding, speech and video coding, and wireless computer networks.

EE 630. Short-Range Wireless Systems. 3 Hours.
This course covers the short-range wireless power transmission (WPT), wireless data communication, and wireless sensor technologies. It emphasizes fundamental understanding of the principles and design procedure of short-range wireless power/data transfer systems as well as the various parameters involved in the optimization of wireless power/data transmission systems.

EE 632. Introduction to Computer Networking. 3 Hours.
Computer networking fundamentals. Layered network model and correspondence to real systems. Discussion of Ethernet, Token Ring, TCP/IP, LAN, and other protocols. Exploration of the Internet and similar systems. Network application models. Simulation of networks.

EE 633. Experiments in Computer Networking. 3 Hours.
Detailed exploration of particular issues in network protocols and network application models. Development of a series of programs to explore the details of network protocols and network application models.

EE 634. Introduction to Neural Networks. 3 Hours.
Artificial neural network topologies and training algorithms with an emphasis on back propagation. Deep learning with Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), applications and limitations of neural networks, and designing networks specific uses.

EE 636. Advanced Digital Design. 3 Hours.
This course covers the design of Complex Programmable Logic Devices (CPLDs) and Field Programmable Gate Arrays (FPGAs). Topics include the design, simulation, and testing of digital systems using a hardware description language and FPGA/CPLD development boards with programmable logic devices.

EE 637. Design of Modern Computer with Digital Integrated Circuits. 3 Hours.
This course covers the design of advanced digital circuits with VLSI components. Topics include synthesis, design, simulation, and testing of advanced digital circuits using a hardware description language and FPGA/CPLD development boards with programmable logic devices. Design examples: switching networks, graphics engine, DSP, Internet of Things (IoT) controller, and programmable logic controller (PLC).

EE 638. Neural Time Series Data Analysis. 3 Hours.
This course covers the theory and practice of analyzing brain signals. Students will learn about conceptual, mathematical and implementational (via MATLAB programming) aspects of time-, frequency- and synchronization-based analyses of magnetoencephalography (MEG), electroencephalography (EEG), and local field potential (LFP) recordings from humans and nonhuman animals.

EE 639. Embedded Systems. 3 Hours.
This course covers both hardware and software trends in advanced embedded system design, including artificial intelligence (AI) and optimized hardware platforms for machine learning (ML). The fundamental algorithms of AI and ML are discussed. Various process acceleration techniques for improving the computational efficiency of ML kernels are implemented on FPGA/CPLD development boards and FPGA/CPLD chips.

EE 640. Object-Oriented Design. 3 Hours.
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EE 641. Modern Control Theory. 3 Hours.
This course covers state variable models for continuous-time and discrete time systems, state feedback and pole placement, and state estimation. Knowledge of basic control systems is recommended.

EE 642. Intelligent Systems. 3 Hours.
This course covers the organization and characteristics of intelligent systems, optimization, evolutionary algorithms, neural networks, fuzzy logic algorithms, and intelligent control.

EE 643. Numerical Methods in Engineering. 3 Hours.
This course covers the theory and practice of numerical methods for a broad spectrum of engineering applications and data analyses. Topics include numerical calculus, linear algebra, and optimization. Students will be exposed to modern topics such as convolutional neural networks, compressed sensing, eigenfaces, stability, principal component analysis, k-means clustering, image segmentation, detection of a signal in the noise, and function fitting. This course provides hands-on practical experience with programming numerical analysis algorithms.

EE 650. Software Engineering. 3 Hours.
This course covers the engineering approach to developing software solutions to real-world problems. Topics include an overview of Software Engineering, requirements elicitation, design, implementation, and an overview of software development methods.

EE 651. Software Engineering Large Systems - I. 3 Hours.
This course covers advanced integrated software systems development methods. Adaptive and prescriptive software systems development methods are covered with an in-depth exploration through team projects using current software development methods.

EE 654. Mobile Computing. 3 Hours.
This course covers the fundamentals and advanced concepts in mobile computing. Develop user interface, application logic, and back-end services, using advanced integrated development environments. Individual and team projects. Programming required.

EE 655. Cloud Computing. 3 Hours.
This course covers fundamental and advanced concepts in cloud computing, including evaluation of current market offerings. Students will also design and implement systems integrating multiple cloud computing services.

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This course covers an introduction to the field of big data analytics, including technologies, challenges, architecture, and hypothesis testing.

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EE 660. Medical Signal Processing. 3 Hours.
This course covers the theory and practice of processing and analyzing single-channel and multiple-channel medical signals. The topics include linear and nonlinear filtering, cross-estimation, autoregressive and spectral modeling, entropy, principal component analysis (PCA), classification, and clustering methods.

EE 667. Advanced Brain Machine Interface. 3 Hours.
This course consists of four major parts: 1) neuroscience and interfaces, 2) brain imaging technologies, 3) front-end circuit design, 4) power/data links and graphical user interface, and 5) circuit, wireless link, and safety simulating software-learning parts.

EE 682. Electromagnetic Field Theory I. 3 Hours.
This course covers the modeling of materials and environments through the simulation of electromagnetic fields. It includes a wide variety of applications, including biomedical and the Internet of Things (IoT). Topics include boundary-value problems and scattering.

EE 690. Special Topics in (Area). 1-6 Hour.
Special topics selected by faculty for master's students.

EE 691. Individual Study in (Area). 1-6 Hour.
Individual study selected by faculty for master's students.

EE 697. Graduate Project. 3 Hours.
Graduate project for Plan II Masters students.

EE 698. Non-Thesis Research. 1-12 Hour.
Individual research in selected area by faculty for master's students.

EE 699. Thesis Research. 1-12 Hour.
Thesis research.
Prerequisites: GAC M

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This course covers advanced integrated software systems development methods. Adaptive and prescriptive software systems development methods are covered with an in-depth exploration through team projects using current software development methods.

EE 752. Software Engineering Large Systems - II. 3 Hours.
This course covers software development in enterprise environments using Dev-Ops practices such as continuous integration and delivery.

EE 754. Mobile Computing. 3 Hours.
This course covers the fundamentals and advanced concepts in mobile computing. Develop user interface, application logic, and backend services, using advanced integrated development environments. Individual and team projects. Programming required.

EE 755. Cloud Computing. 3 Hours.
This course covers fundamental and advanced concepts in cloud computing, including evaluation of current market offerings. Students will also design and implement systems integrating multiple cloud computing services.

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This course covers an introduction to the field of big data analytics, including technologies, challenges, architecture, and hypothesis testing.

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EE 767. Advanced Brain Machine Interface. 3 Hours.
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Individual study in an area selected by faculty for PhD students.

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Individual research in selected problem by faculty for PhD students.

EE 799. Dissertation Research. 1-12 Hour.
PhD dissertation research.
Prerequisites: GAC Z

Computer Engineering

Degree Offered	PhD in Computer Engineering
Website	https://www.uab.edu/engineering/ece/
Director	Leon Jololian, PhD
Phone	(205) 934-8440
E-mail	leon@uab.edu

Program Information

The PhD degree prepares students for professional and research careers in industry and academia. The PhD in Computer Engineering is awarded by UAB and is offered through a program shared with the University of Alabama in Huntsville (UAH), allowing both UAB and UAH to contribute to the program.

Admission Requirements

Requirements for admission to the PhD program include the following:

1. A bachelor's degree in an accredited electrical or computer engineering program or a bachelor's degree in a related program acceptable to the graduate faculty in Electrical and Computer Engineering; students not having a bachelor's degree in electrical or computer engineering may be required to complete prerequisite courses, which will be defined at the time of admission.
2. An overall GPA of at least 3.0 on a 4.0 point scale, or at least 3.0 for the last 60 semester hours completed; and
3. Three letters of recommendation concerning the applicant's previous academic and professional work.
4. International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details;
5. Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School (detailed instructions are included during the online application process);

Financial Support

Fellowships and/or assistantships may be available for well-qualified students admitted into the PhD program. In order to be considered for financial aid for the coming academic year, the completed application materials must usually be received at UAB by April 1.

There are a number of minority fellowships available through the Graduate School. Contact the UAB Graduate School directly for further information.

Additional Information

Deadline for Entry Term(s):	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office:	Seven days before the start of the term

The PhD degree prepares students for professional and research careers in industry and academia. The PhD in Computer Engineering is awarded by UAB and is offered through a program shared with the University of Alabama in Huntsville (UAH), allowing both UAB and UAH to contribute to the program.

Committee and Candidacy Requirements

In addition to completing coursework requirements (see below), doctoral students must form a Graduate Dissertation Committee consisting of at least five faculty members, including the primary research mentor. At least two committee members must have a primary appointment at UAB in the Department of Electrical and Computer Engineering and one must have a primary appointment at UAH in the Electrical and Computer Engineering Department.

A comprehensive examination is required of all doctoral candidates. This exam is given after:

- All coursework is completed,
- Successful completion of GRD 717 Principles of Scientific Integrity, and
- The student's Graduate Committee, which consists of faculty representatives from both campuses, deems the student to have adequate preparation in the major and minor fields of study.

The examination is conducted by the Graduate Committee and administered on the resident campus. The examination consists of a written part and an oral part. The student presents a dissertation proposal during the oral portion of the examination. The comprehensive examination may only be taken twice.

After successfully passing the exam and defense, the graduate student will then enter into doctoral candidacy. Doctoral candidates must complete a minimum of 24 hours of dissertation research and then develop a dissertation for review by the dissertation committee. The candidate must also present an oral public defense of their dissertation. This must take place at least two semesters before the student may graduate. If the defense is successful, the student then has 10 working days to revise the dissertation and submit its approved form to the Graduate School by the published deadline.

Additional Academic Policies

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined credit hours of Special Topics and/or Independent Study courses will be applied to the Computer Engineering PhD without appeal to and approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

Post Bachelor Requirements

Students entering the PhD program with a bachelor degree are required to complete at least 48 credit hours of coursework followed by 24 credit hours of dissertation research.

- 18 credit hours of approved coursework in computer engineering
- 12 credit hours of approved coursework in electrical or computer engineering
- 9 credit hours of approved coursework in mathematics, theoretical or formal methods as related to computer engineering
- 6 credit hours of approved coursework in fields that support the dissertation research
- 3 credit hours of GRD 717 Principles of Scientific Integrity
- 24 credit hours of EE 799 Dissertation Research

Post Master Coursework Requirements

Students entering the PhD program with a master degree are required to complete at least 27 credit hours of coursework followed by 24 credit hours of dissertation research.

- 9 credit hours of approved coursework in computer engineering
- 6 credit hours of approved coursework in electrical or computer engineering
- 6 credit hours of approved coursework in mathematics, theoretical or formal methods as related to computer engineering
- 3 credit hours of approved coursework in fields that support the dissertation research
- 3 credit hours of GRD 717 Principles of Scientific Integrity
- 24 credit hours of EE 799 Dissertation Research

Courses

EE 512. Practical Computer Vision. 3 Hours.
This course covers the fundamentals and application of image analysis. Topics include: image pre-processing, detection, segmentation, classification and recognition, visual tracking, and deep learning.

EE 518. Wireless Communications. 3 Hours.
This course covers the principles and current applications of wireless technology. Topics include propagation models, modulation, multiple access, and channel and signal coding. Applications of wireless for cellular and Internet of Things (IoT) will also be covered.

EE 521. Communication Systems. 3 Hours.
This course covers the mathematics of modulation and demodulation of radio signals to transmit and receive information. It focuses on various forms of amplitude modulation (AM), phase and frequency modulation (FM). This course builds on the mathematics from signals and systems course to study how to represent and manipulate these signals in both time and frequency domain. It also studies the effects of sampling, and how these systems operate in the presence of noise.

EE 523. Digital Signal Processing. 3 Hours.
This course covers the theory and practice of using computers to process and analyze signals. The topics include: digital filter analysis and design; Fast Fourier Transform (FFT) algorithms; applications of digital signal processing in engineering problems such as data acquisition and control.

EE 526. Control Systems. 3 Hours.
This course covers modeling and control of mechanisms or circuits to satisfy stability and performance criteria. Topics include: theory of linear feedback control systems using complex frequency techniques, block diagram manipulation, performance measures, stability, analysis and design using root locus, and Z-transform methods.

EE 527. Industrial Control. 3 Hours.
This course covers power control devices and applications, relay logic and translation to other forms, programmable logic controllers (PLCs), proportional-integral-derivative (PID) and other methods for process control, modern laboratory instrumentation, and human-machine interface (HMI) software.

EE 531. Analog Integrated Electronics. 4 Hours.
This course covers advanced analysis and design using op-amps, differential amplifier, half-circuit analysis, error analysis and compensation. Applications include signal conditioning for instrumentation, instrumentation amplifiers, nonlinear and computational circuits, analog filter design, voltage regulator design, and oscillators, circuit configurations for A-to-D and D-to-A conversion methods. Laboratory exercises emphasize design techniques for projects in areas such as Internet-of-Things (IoT).

EE 532. Introduction to Computer Networking. 3 Hours.
This course covers the fundamentals of modern computer networks including current applications such as Internet of Things (IoT). Topics include: hardware and software level network protocols, network architecture and topology including WANs and LANs, client-server relationships, distributed computing, data transfer, security, virtualization of hardware, multi-tier network configuration examples, and certifications will be addressed.
Prerequisites: EE 134 [Min Grade: C] and EE 210 [Min Grade: C]

EE 533. Engineering Software Solutions. 3 Hours.
This course covers the fundamentals of software design, architecture, and implementation for future software engineers. Topics include: customer-focused requirements gathering, project planning, team tools, architectural patterns, environment and component selection, quality assurance, sustainability, and versioning. Various development methodologies are discussed with a project demonstrating at least one release cycle.

EE 534. Power Semiconductor Electronics. 3 Hours.
This course covers the fundamentals of power electronics such as principles of static power conversions, basic power converter architectures, power semiconductor switches, steady-state equivalent circuit modeling, DC transformer model, basic AC equivalent circuit modeling, linearization and perturbation. Pulse width modulation and controller design, circuit design considerations, and applications of power electronics. The course project emphasizes computer-aided analysis and design of power electronic circuits.

EE 537. Introduction to Embedded Systems. 3 Hours.
This course provides an applied introduction to the design of embedded systems, including hardware and software aspects. Topics include: various embedded hardware platforms, interfacing industrial bus systems, sensors, actuators, low-power wireless communication, and the application of the Internet of Things (IoT).

EE 538. Computer Architecture. 3 Hours.
Advanced microprocessor topics include a comparison of advanced contemporary microprocessors, cache design, pipelining, superscalar architecture, design of control units, microcoding, and parallel processors. Basic knowledge of microprocessors is recommended.

EE 544. Real-Time Process & Protocols. 3 Hours.
This course covers hands-on laboratory topics in real-time computer systems, such as algorithms, state-machine implementations, communication protocols, instrumentation, and hardware interfaces.

EE 547. Internet/Intranet Application Development. 3 Hours.
This course covers development of software models and applications using Internet/Intranet technologies. Topics include: web client-server relationships, multi-tier design models, scripting and validation, basic TCP/IP networking, separation of concerns, markup and data description languages. Projects will allow the opportunity for the use of a range of tools and development platforms.
Prerequisites: EE 233 [Min Grade: C]

EE 548. Software Engineering Projects. 3 Hours.
This course covers practical applications of software engineering including the development of applications for the Internet of Things (IoT). Topics include: requirements gathering, design matrices, environment selection, relevant architectural patterns, networking basics, databases, service endpoints, embedded systems selection and security. Projects with a software emphasis will be utilized to demonstrate the principles of IoT applications.
Prerequisites: EE 333 [Min Grade: C]

EE 552. Digital Systems Design. 3 Hours.
This course covers the design of customized complex digital systems using Field Programmable Gate Array (FPGA) based platforms, using modern design tools for simulation, synthesis, and implementation. Topics include hardware design and development languages such as Verilog or VHDL.

EE 558. Medical Instrumentation. 3 Hours.
This course covers the fundamental operating principles, applications, safety, and design of electronic instrumentation used in the measurement of physiological parameters.

EE 561. Machinery II. 3 Hours.
Physical principles of DC machines. Mathematical analysis of generator designs using equivalent circuits and magnetization curves. Calculation of motor speed, torque, power, efficiency, and starting requirements. Solid-state speed control systems.

EE 563. Medical Image Analysis. 3 Hours.
A lab-based introduction to processing, analysis, and display techniques for medical imaging.

EE 567. Brain Machine Interface. 3 Hours.
This course explores the brain-machine interfaces, particularly the technologies that directly stimulate and/or record neural activity. This course is divided into three major components: 1) neuroscience and electrode interfaces, 2) brain recording and stimulating front-end circuits, and 3) circuit modeling, simulation, and optimization.

EE 571. Power Systems I. 3 Hours.
Components of power systems. Performance of modern interconnected power system under normal and abnormal conditions. Calculation of inductive and capacitive reactances of three-phase transmission lines in a steady state.

EE 572. Power Systems II. 3 Hours.
Modeling of generators, transformers, and transmission lines for system studies. Introduction to symmetrical components. Calculation of short-circuit currents due to balanced and unbalanced faults. Determination of interrupting ratings of circuit breakers. Transient stability of power systems. Derivation of swing equation and solution by numerical method. Equal area criterion. A power system design project is required.

EE 573. Protective Relaying of Power Systems. 3 Hours.
Operating principles of protective relays. Protection of transmission lines, generators, motors, transformers, and buses.

EE 585. Engineering Operations. 3 Hours.
This course covers the principles and standard of engineering design from ideation to final design. Topics include: product development process, problem definition and need identification, embodiment and detail design, design for specific criterion, modeling and cost evaluation. Emphasis is placed on ethics and civil responsibilities in design including environmental, social issues, liability, sustainability and reliability through the lens of engineering design.

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This course covers the design of advanced digital circuits with VLSI components. Topics include synthesis, design, simulation, and testing of advanced digital circuits using a hardware description language and FPGA/CPLD development boards with programmable logic devices. Design examples: switching networks, graphics engine, DSP, Internet of Things (IoT) controller, and programmable logic controller (PLC).

EE 638. Neural Time Series Data Analysis. 3 Hours.
This course covers the theory and practice of analyzing brain signals. Students will learn about conceptual, mathematical and implementational (via MATLAB programming) aspects of time-, frequency- and synchronization-based analyses of magnetoencephalography (MEG), electroencephalography (EEG), and local field potential (LFP) recordings from humans and nonhuman animals.

EE 639. Embedded Systems. 3 Hours.
This course covers both hardware and software trends in advanced embedded system design, including artificial intelligence (AI) and optimized hardware platforms for machine learning (ML). The fundamental algorithms of AI and ML are discussed. Various process acceleration techniques for improving the computational efficiency of ML kernels are implemented on FPGA/CPLD development boards and FPGA/CPLD chips.

EE 640. Object-Oriented Design. 3 Hours.
This course provides in-depth coverage of object-oriented design principles and methodologies. Topics include object-oriented design frameworks, use-cases, class-responsibility-collaboration (CRC), design patterns, and software reuse. Knowledge of an object-oriented language is recommended.

EE 641. Modern Control Theory. 3 Hours.
This course covers state variable models for continuous-time and discrete time systems, state feedback and pole placement, and state estimation. Knowledge of basic control systems is recommended.

EE 642. Intelligent Systems. 3 Hours.
This course covers the organization and characteristics of intelligent systems, optimization, evolutionary algorithms, neural networks, fuzzy logic algorithms, and intelligent control.

EE 643. Numerical Methods in Engineering. 3 Hours.
This course covers the theory and practice of numerical methods for a broad spectrum of engineering applications and data analyses. Topics include numerical calculus, linear algebra, and optimization. Students will be exposed to modern topics such as convolutional neural networks, compressed sensing, eigenfaces, stability, principal component analysis, k-means clustering, image segmentation, detection of a signal in the noise, and function fitting. This course provides hands-on practical experience with programming numerical analysis algorithms.

EE 650. Software Engineering. 3 Hours.
This course covers the engineering approach to developing software solutions to real-world problems. Topics include an overview of Software Engineering, requirements elicitation, design, implementation, and an overview of software development methods.

EE 651. Software Engineering Large Systems - I. 3 Hours.
This course covers advanced integrated software systems development methods. Adaptive and prescriptive software systems development methods are covered with an in-depth exploration through team projects using current software development methods.

EE 654. Mobile Computing. 3 Hours.
This course covers the fundamentals and advanced concepts in mobile computing. Develop user interface, application logic, and back-end services, using advanced integrated development environments. Individual and team projects. Programming required.

EE 655. Cloud Computing. 3 Hours.
This course covers fundamental and advanced concepts in cloud computing, including evaluation of current market offerings. Students will also design and implement systems integrating multiple cloud computing services.

EE 656. Introduction to Big Data Analytics. 3 Hours.
This course covers an introduction to the field of big data analytics, including technologies, challenges, architecture, and hypothesis testing.

EE 658. Machine Learning in Engineering. 3 Hours.
This course covers techniques for developing solutions to complex problems in different engineering domains without having to explicitly program the computers. Topics include supervised and unsupervised learning, classification and regression, support vector machines (SVM), boosting, and artificial neural networks.

EE 660. Medical Signal Processing. 3 Hours.
This course covers the theory and practice of processing and analyzing single-channel and multiple-channel medical signals. The topics include linear and nonlinear filtering, cross-estimation, autoregressive and spectral modeling, entropy, principal component analysis (PCA), classification, and clustering methods.

EE 667. Advanced Brain Machine Interface. 3 Hours.
This course consists of four major parts: 1) neuroscience and interfaces, 2) brain imaging technologies, 3) front-end circuit design, 4) power/data links and graphical user interface, and 5) circuit, wireless link, and safety simulating software-learning parts.

EE 682. Electromagnetic Field Theory I. 3 Hours.
This course covers the modeling of materials and environments through the simulation of electromagnetic fields. It includes a wide variety of applications, including biomedical and the Internet of Things (IoT). Topics include boundary-value problems and scattering.

EE 690. Special Topics in (Area). 1-6 Hour.
Special topics selected by faculty for master's students.

EE 691. Individual Study in (Area). 1-6 Hour.
Individual study selected by faculty for master's students.

EE 697. Graduate Project. 3 Hours.
Graduate project for Plan II Masters students.

EE 698. Non-Thesis Research. 1-12 Hour.
Individual research in selected area by faculty for master's students.

EE 699. Thesis Research. 1-12 Hour.
Thesis research.
Prerequisites: GAC M

EE 701. Electrical and Computer Engineering Seminar. 1-3 Hour.
This course consists of research presentations delivered by faculty, research assistants, and invited guests in various state-of-the-art and popular topics related to Electrical and Computer Engineering.

EE 710. Technical Communication for Engineers. 3 Hours.
A workshop-oriented course providing students with the opportunity to produce technical memoranda, a proposal, and a conference and/or refereed journal paper and to make oral presentations related to these work products utilizing appropriate software presentation aids.

EE 716. Design of CMOS Analog Integrated Circuits. 3 Hours.
This course will cover basic building blocks of CMOS analog VLSI design, MOSFET theory, short channel device and nonlinear effects, current mirrors, current-reference generator, operational trans conductance amplifier, switched capacitor architecture, analog-to-digital converter and digital-to-analog converter. Students will be required to develop a computer aided design, simulation and chip layout of an analog integrated circuit design project. Fundamental knowledge in electronics is required.

EE 721. Random Variables and Processes. 3 Hours.
Theory underlying analysis and design of communication, stochastic control, data gathering, and data analysis systems.

EE 722. Advanced Communication Theory. 3 Hours.
Analysis of the performance of analog modulation techniques in presence of noise.

EE 723. Computer Vision. 3 Hours.
Advanced topics in computer vision: Image segmentation, registration, and visual tracking; applications of deep learning to image analysis.

EE 724. Digital Communications. 3 Hours.
Design and analysis of digital communications modulation techniques and systems and their performance in the presence of noise.
Prerequisites: EE 622 [Min Grade: C]

EE 725. Information Theory and Coding. 3 Hours.
Channel models and block codes, block code ensemble performance analysis, convolutional codes and ensemble performance, sequential decoding of convolutional codes.
Prerequisites: EE 621 [Min Grade: C]

EE 726. Digital Image Processing. 3 Hours.
This course covers topics in image transformations, enhancement, restoration, compression, and representation. Introduction to image segmentation.

EE 727. Wireless Communications. 3 Hours.
Wireless communication system topics such as propagation, modulation techniques, multiple access techniques, channel coding, speech and video coding, and wireless computer networks.

EE 730. Short-Range Wireless Systems. 3 Hours.
This course covers the short-range wireless power transmission (WPT), wireless data communication, and wireless sensor technologies. It emphasizes fundamental understanding of the principles and design procedure of short-range wireless power/data transfer systems as well as the various parameters involved in the optimization of wireless power/data transmission systems.

EE 732. Introduction to Computer Networking. 3 Hours.
Computer networking fundamentals. Layered network model and correspondence to real systems. Discussion of Ethernet, Token Ring, TCP/IP, LAN, and other protocols. Exploration of the Internet and similar systems. Network application models. Simulation of networks.

EE 733. Experiments in Computer Networking. 3 Hours.
Detailed exploration of particular issues in network protocols and network application models. Development of series of programs to explore the details of network protocols and network application models.

EE 734. Introduction to Neural Networks. 3 Hours.
Artificial neural network topologies and training algorithms with an emphasis on back propagation. Deep learning with Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), applications and limitations of neural networks, and designing networks for specific uses.

EE 736. Advanced Digital Design. 3 Hours.
This course covers the design of Complex Programmable Logic Devices (CPLDs) and Field Programmable Gate Arrays (FPGAs). Topics include the design, simulation, and testing of digital systems using a hardware description language and FPGA/CPLD development boards with programmable logic devices.

EE 737. Design of Modern Computers with Digital Integrated Circuits. 3 Hours.
This course covers the design of advanced digital circuits with VLSI components. Topics include synthesis, design, simulation, and testing of advanced digital circuits using a hardware description language and FPGA/CPLD development boards with programmable logic devices. Design examples: switching networks, graphics engine, DSP, Internet of Things (IoT) controller, and programmable logic controller (PLC).

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This course covers theory and practice of analyzing brain signals. Students will learn about conceptual, mathematical and implementational (via MATLAB programming) aspects of time-, frequency- and synchronization-based analyses of magnetoencephalography (MEG), electroencephalography (EEG), and local field potential (LFP) recordings from humans and nonhuman animals.

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This course covers both hardware and software trends in advanced embedded system design, including artificial intelligence (AI) and optimized hardware platforms for machine learning (ML). The fundamental algorithms of AI and ML are discussed. Various process acceleration techniques for improving the computational efficiency of ML kernels are implemented on FPGA/CPLD development boards and FPGA/CPLD chips.

EE 740. Object-Oriented Design. 3 Hours.
This course provides in-depth coverage of object-oriented design principles and methodologies. Topics include: object-oriented design frameworks, use-cases, class-responsibility-collaboration (CRC), design patterns, and software reuse. Knowledge of an object-oriented language is recommended.

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This course covers state variable models for continuous-time and discrete time systems, state feedback and pole placement, and state estimation. Knowledge of basic control systems is recommended.

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EE 750. Software Engineering. 3 Hours.
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EE 751. Software Engineering Large Systems - I. 3 Hours.
This course covers advanced integrated software systems development methods. Adaptive and prescriptive software systems development methods are covered with an in-depth exploration through team projects using current software development methods.

EE 752. Software Engineering Large Systems - II. 3 Hours.
This course covers software development in enterprise environments using Dev-Ops practices such as continuous integration and delivery.

EE 754. Mobile Computing. 3 Hours.
This course covers the fundamentals and advanced concepts in mobile computing. Develop user interface, application logic, and backend services, using advanced integrated development environments. Individual and team projects. Programming required.

EE 755. Cloud Computing. 3 Hours.
This course covers fundamental and advanced concepts in cloud computing, including evaluation of current market offerings. Students will also design and implement systems integrating multiple cloud computing services.

EE 756. Introduction to Big Data Analytics. 3 Hours.
This course covers an introduction to the field of big data analytics, including technologies, challenges, architecture, and hypothesis testing.

EE 758. Machine Learning in Engineering. 3 Hours.
This course covers techniques for developing solutions to complex problems in different engineering domains without having to explicitly program the computers. Topics include supervised and unsupervised learning, classification and regression, support vector machines(SVM), boosting, and artificial neural networks.

EE 760. Medical Signal Processing. 3 Hours.
This course covers the theory and practice of processing and analyzing single-channel and multiple-channel medical signals. The topics include linear and nonlinear filtering, cross-estimation, autoregressive and spectral modeling, entropy, principal component analysis (PCA), classification, and clustering methods.

EE 767. Advanced Brain Machine Interface. 3 Hours.
This course consists of four major parts: 1) neuroscience interfaces, 2) brain imaging technologies, 3) front-end circuit design, 4) power/data links and graphical user interface, and 5) circuit, wireless link, and safety simulating software-learning parts.

EE 781. Electromagnetic Field Theory I. 3 Hours.
This course covers the modeling of materials and environments through the simulation of electromagnetic fields. It includes a wide variety of applications, including biomedical and the Internet of Things (IoT). Topics include boundary-value problems and scattering.

EE 790. Special Topics in (Area). 1-6 Hour.
Special topics selected by faculty for PhD students.

EE 791. Individual Study in (Area). 1-6 Hour.
Individual study in an area selected by faculty for PhD students.

EE 798. Non-Dissertation Research. 1-12 Hour.
Individual research in selected problem by faculty for PhD students.

EE 799. Dissertation Research. 1-12 Hour.
PhD dissertation research.
Prerequisites: GAC Z

Materials Science and Materials Engineering

Degrees Offered:	Master of Science in Materials Engineering
	PhD in Materials Engineering
	PhD in Materials Science
Program Director	Vinoy Thomas, PhD
Email	vthomas@uab.edu
Phone:	(205) 934-8450
Website:	https://www.uab.edu/engineering/mse/graduate

Are you passionate about materials innovation for advancing technology? Are you ready for pursuing higher study and research in the materials spectrum? The Department of Materials Science and Engineering offers the opportunity to conduct cutting-edge research in the fields of metals and alloys, polymers and composites, biomaterials and healthcare materials and devices, ceramics and glass, and nanomaterials for a wide array of applications.

Courses

MSE 501. Materials Processing. 3 Hours.
Processing of metals, glasses, ceramics, and composites. Powder, casting, welding, rapid solidification, and other advanced approaches.

MSE 505. Frontiers of Automotive Materials. 3 Hours.
Advanced lightweight automotive materials, manufacturing and modeling techniques. Technology advancements in cost-effective carbon, glass and related reinforcements; "green" and sustainable materials, crashworthiness and injury protection of occupants and pedestrians, metal castings, heavy truck, mass transit, fuel cell and hybrid vehicles. Students taking this class will receive a GATE certificate of training in automotive materials technologies upon successful completion.

MSE 508. Nanobiomaterials. 3 Hours.
Basic tools of nanotechnology, building blocks of nanostructured materials. Behavior of materials with nanoscale structures and their technological applications, including automotive, medical, and electronic applications. Introduction to biomaterials and nanobiomaterials, nanotoxicity and how to work safely with nanomaterials. Concepts in tissue engineering with special focus on nanoscaffolds and nanoparticles in drug delivery.

MSE 509. Principles of Metal Casting. 3 Hours.
Production and evaluation of cast ferrous metals (gray iron, ductile iron, steel) and non-ferrous metals (brass, bronze, aluminum). Design of castings and molds. Laboratory on the gating, risering and molten metal treatment, analysis and handling techniques required to produce high quality castings. It is recommended that students who register for this course have successfully completed MSE 280 Engineering Materials or an equivalent course.

MSE 509L. Principles of Metal Casting. 0 Hours.
Laboratory component of MSE 509 and must be taken concurrently.

MSE 513. Composite Materials. 3 Hours.
Processing, structure, and properties of metal-, ceramic-, and polymer-matrix composite materials. Roles of interfacial bond strength, reinforcement type and orientation and matrix selection in physical and mechanical properties of composite materials.

MSE 525. Statistics and Quality. 3 Hours.
This course is arranged to reflect the sequential steps an engineer or scientist take to assess process capability and implement process improvement studies. There is a focus on connecting the theoretical equations to practical examples as well as interpreting and communicating of statistical results.

MSE 530. Polymeric Materials. 3 Hours.
Processing methods, structure/engineering/property relationships, and applications of polymeric materials.

MSE 530L. Polymeric Materials Lab. 0 Hours.
Laboratory component of MSE 530 and must be taken concurrently.

MSE 533. Nondestructive Evaluation of Materials. 3 Hours.
Principles, applications, and limitations of ultrasonic vibrations, acoustic emission, radiographic, magnetic particle, eddy current, and other nondestructive testing methods. Intelligent sensors and health monitoring of real structures.

MSE 545. The Evolution of Engineering Materials. 3 Hours.
Past, present and future of engineering materials; how new materials and processing methods have impacted human society, from the Stone Age until today. Taught as a 3-week study abroad course in Germany, with visits to universities, industrial facilities, research labs, museums and selected cultural sites.

MSE 562. Composites Manufacturing. 3 Hours.
Principles of manufacturing and processing of polymeric matrix composites. Production techniques including filament winding, pultrusion, and liquid infusion techniques combined with design, environmental and manufacturing issues of polymer matrix composites.

MSE 564. Metals and Alloys. 4 Hours.
Microstructures, properties, heat treatment, and processing of ferrous and nonferrous materials.

MSE 564L. Metals and Alloys Lab. 0 Hours.
Laboratory component of MSE 564 and must be taken concurrently.

MSE 565. Characterization of Materials. 4 Hours.
Theory and practice of materials characterization, with emphasis on optical metallography, quantitative metallography, scanning electron microscopy, crystallography, and x-ray diffraction. Specific application in metals and ceramics considered.

MSE 565L. Characterization of Materials Laboratory. 0 Hours.
Laboratory component of MSE 565 and must be taken concurrently with MSE 565.

MSE 570. Ceramic Materials. 4 Hours.
Structure, processing, properties, and uses of ceramic compounds and glasses. Mechanical, thermal, and electrical behavior of ceramic materials in terms of microstructure and processing variables.

MSE 570L. Ceramic Materials Laboratory. 0 Hours.
Laboratory component of MSE 570 and must be taken concurrently.

MSE 574. Metals and Alloys II. 3 Hours.
Production and physical metallurgy of ferrous and non-ferrous alloys including: steel alloys, inoculation and production of ductile, gray, compacted and malleable iron; advanced heat treatments of steel and iron; conventional and ultra-high strength aluminum alloys; wrought and cast copper alloys; wrought and cast magnesium alloys.

MSE 590. Special Topics in Materials Science & Engineering. 1-3 Hour.
Special Topics in Materials Science & Engineering.

MSE 591. Individual Study in Materials Science & Engineering. 1-6 Hour.
Individual Study in Materials Science & Engineering.

MSE 601. Materials Science and Engineering Seminar. 0 Hours.
Seminar focusing on student research and guest presentations of various topics of interest to materials students.

MSE 602. Intro to Thermodynamics and Mechanics of Materials. 3 Hours.
This course is a survey of undergraduate level theory and application of the fundamental principles of mechanics of materials and thermodynamics. Understanding is based on the explanation of the physical behavior of materials under load and then modeling this behavior to develop the theory. Intended to provide the students with both the theory and application of the fundamental principles of thermodynamics of materials. Students must be graduate student in engineering, chemistry or physics.

MSE 603. Thermodynamics of Materials. 3 Hours.
Atomistic and classical approaches to the understanding of the thermodynamics of solids, phase transformations, chemical reactions, and alloy systems.

MSE 605. Introduction to Physical Materials. 3 Hours.
Overview of fundamental concepts of materials science and engineering, focusing on chemical and physical properties such as bonding, crystal structure and defects, diffusion, and phase diagrams.

MSE 606. Introduction to Manufacturing Engineering. 3 Hours.
Manufacturing is the process of transforming raw materials into products. Even the most optimized and controlled industrial processes are fraught with variability and inefficiencies, both of which can have a negative impact on profitability. This course will introduce students to the proven tools to characterize and optimize industrial processes. In addition, students will learn the statistical techniques to quantitative assess and detect changes to a process and make data-driven decisions to improve that process.

MSE 607. Measurement Systems Analysis. 3 Hours.
Whether in a manufacturing process, research & development lab or quality control, assessment and analysis of data used for decision making has roots in the equipment and procedures that make up a measurement system. Students will learn to critically assess the capability of measurements systems, gauges and analytical equipment used to collect data. Students will learn metrology, best practices, and statistical tools to quantitatively assess, as well as procedures to implement a Gage R&R study to improve a measurement system. In addition, students will learn effective communication strategies for presenting the results of statistical analysis.

MSE 608. Process Characterization and Advanced Statistical Analysis. 3 Hours.
This course centers on manufacturing processes and the inherent variability of all products. Product variability has origins at all input points in a process; raw materials, energy, time, human, etc. This course will expose engineers to the statistics to quantify and assess variability. In addition to statistical tools, we will delve deep into all phases of the DMAIC (Define, Measure, Analysis, Improve, and Control) methodology and the Lean/Six Sigma tools to identify, implement and document process improvements. An emphasis will be placed on the communication of these often-complicated statistics in an industrial setting. We will put these concepts into practice through completion of a final term paper. Students will be required to choose an industrial process and apply and communicate the concepts learned in this course.

MSE 610. Advanced Materials, Manufacturing and Applications Development. 3 Hours.
Introduction to advanced materials by design, near net-shape cost-effective manufacturing, synergistic knowledge of material properties, durability and function. Hands on activities related to extrusion-compression, fiber spinning, thermoset/thermoplastic materials, medical grade materials, intermediate forms and hybrid manufacturing. Integrated process and product development methodology. Student projects will involve manufacturing processes associated with mass production.

MSE 613. Mechanical Behavior of Materials. 3 Hours.
Microstructural effects on the deformation mechanisms responsible for mechanical behavior of engineering materials.

MSE 614. Process Quality Engineering. 3 Hours.
Application of the concepts and tools of total quality to develop, implement, and maintain an effective quality assurance system in a materials processing and manufacturing environment. Students will be exposed to probability models, statistical tools, linear and multiple regression, DOE, TQM and six sigma.

MSE 624. Physical Metallurgy. 3 Hours.
Course will consider the fundamental thermodynamic and kinetic principles governing the behavior of metals and alloys, particularly with respect to their influence the formation and evolution of microstructure. Topics will include liquid-solid and solid-state phase transformations, nucleation, growth, solidification and diffusion.

MSE 625. Plasma Processing of Materials. 3 Hours.
This Online course is designed to introduce the concepts, fundamentals, and applications of plasma surface processing to materials science and engineering students. This is a 3-credit hour graduate level course. This course will feature a primer on plasmas as a unique thermodynamic state of matter. Specifically, there will be an emphasis on non-equilibrium thermal states and how these are used in materials processing and surface engineering. Special topics including plasma generation, control, and diagnostics will be provided. Furthermore, Types of Plasmas, CVD process for polymerization and hard coating, Corona treatment of fibers for composites, spark plasma sintering, plasma- spray coating, etc. surface characterization of plasma-processed surfaces will be discussed in detail: including structure/property relationships, surface morphology (including nanoscale features), and surface chemistry and their relationships to functional surface design. Spectroscopic techniques including x-ray photoelectron spectroscopy (XPS), optical emission spectroscopy (OES) and Surface mechanical properties testing (Nanoindentation) and contact angle measurements. Additional topics will be covered as time in the semester permits. This course will give prospective students a wide coverage of plasma tools and techniques toward functional material design.

MSE 628. Thermal Characterization. 3 Hours.
This lab-oriented course will be focused to give graduate students the theory and hands-on experience in operation, data acquisition and interpretation of widely used thermal characterization techniques such as differential scanning calorimeter (DSC), thermo gravimetric analyzer (TGA) , Simultaneous TGA-DTA, Thermo mechanical analyzer (TMA), Dynamic mechanic analyzer (DMA) and rheological and viscosity analyses of polymeric resins and composite materials. Exposure to TGA combination techniques with chemical analysis (Fourier Transform infrared spectrometer (FT-IR), Gas Chromatography (GC) and Mass spectrometry (MS)).

MSE 628L. Thermal Characterization Lab. 0 Hours.
Laboratory component of MSE 628 and must be taken concurrently.

MSE 629. Polymer Structure and Morphology. 3 Hours.
Polymer structures and morphology and it's relationships with applications, multicomponent polymer systems (polymer blends, copolymers, micro and nanocomposites), liquid crystalline polymers, polymer crystals, oriented polymers, morphological aspects of deformation and advances in polymers (biomimetic and bioinspired polymer systems).

MSE 633. Advanced Mechanics of Deformation. 3 Hours.
Basics and intermediate mechanics of deflection of beams and columns, mechanics of impact, failure theories, plastic deformation of materials, fracture mechanics, fatigue, creep and vibration. The topics will be supported by industry relevant case studies. Suggested prerequisites included Mechanics of Solids (CE 220) and Mechanical Behavior (MSE 382).

MSE 635. Advanced Mechanics of Composites. 3 Hours.
Classical lamination theory, analysis and failure of reinforced composite material systems, anisotropic elasticity, stress analysis and design of laminated composites including 3D effects, stress concentrations, free-edge effects, hygrothermal behavior, adhesive and mechanical connections.

MSE 636. Engineering Fibers. 3 Hours.
Processing-microstructure-properties of different fibrous materials: natural polymeric fibers (jute, sisal, silk, etc.), synthetic polymeric fibers (aramid and polyethylene, etc.), metallic fibers, and high performance ceramic fibers (alumina and silicon carbide). Application of Weibull statistics to strength of fibrous materials, techniques of mechanical testing of fibers and applications of fibers in various fields.

MSE 638. Degradation of Materials. 3 Hours.
Basics of materials degradation- thermodynamics and kinetics - Pourbaix diagram, chemical and electrochemical reactions; Degradation types and mechanisms; Degradation of different material systems: Metals, alloys, ceramics and glasses, polymers and composites for versatile applications- structural, functional, energy and biomedical; Impact on materials properties; Investigation for materials degradation; Protection from degradation and materials design;Environmental and biological aspects; Societal impact.

MSE 667. Process Modeling/Simulation. 3 Hours.
Theory and practice of analytical methods and computational modeling for manufacturing processes of metals, ceramics, polymers and composites. Applications on processes such as metal cutting, welding, casting, massive forming, solidification, rapid prototyping, injection molding and resin transfer molding.

MSE 668. Applied Finite Element Analysis. 3 Hours.
Finite Element Analysis (FEA) is used widely for design optimization and failure prediction in automobile, energy, aerospace, and other industries. This course primarily looks at how practically to set up static structural models and get meaningful results. The focus will be on applying loading and boundary conditions, good meshes, convergence of results, and correct interpretation of results. Students will learn how to set up models using programs such as Pro/Engineer and ANSYS.

MSE 670. Physical Characterization. 3 Hours.
Theory and practice of materials characterization, with emphasis on optical metallography, quantitative metallography, scanning electron microscopy, crystallography, and x-ray diffraction. Specific application in metals and ceramics considered.

MSE 670L. Physical Characterization Lab. 0 Hours.
Laboratory component of MSE 670 and must be taken concurrently.

MSE 690. Special Topics In (Area). 1-6 Hour.
Special Topics in (Area).

MSE 690L. Special Topics in (Area) Laboratory. 0 Hours.
Special Topics in (Area) laboratory.

MSE 691. Individual Study in (Area). 1-6 Hour.
Individual Study in (Area).

MSE 698. Non-Thesis Research. 1-12 Hour.

MSE 699. Thesis Research. 1-12 Hour.
Prerequisites: GAC M

MSE 701. Materials Science and Engineering Seminar. 0 Hours.
Seminar focusing on student research and guest presentations of various topics of interest to materials students.

MSE 702. Intro to Thermodynamics and Mechanics of Materials. 3 Hours.
This course is a survey of undergraduate level theory and application of the fundamental principles of mechanics of materials and thermodynamics. Understanding is based on the explanation of the physical behavior of materials under load and then modeling this behavior to develop the theory. Intended to provide the students with both the theory and application of the fundamental principles of thermodynamics of materials. Students must be graduate student in engineering, chemistry or physics.

MSE 703. Thermodynamics of Materials. 3 Hours.
Atomistic and classical approaches to the understanding of the thermodynamics of solids, phase transformations, chemical reactions, and alloy systems.

MSE 705. Introduction to Physical Materials. 3 Hours.
Overview of fundamental concepts of materials science and engineering, focusing on chemical and physical properties such as bonding, crystal structure and defects, diffusion, and phase diagrams.

MSE 710. Advanced Materials, Manufacturing and Applications Development. 3 Hours.
Introduction to advanced materials by design, near net-shape cost-effective manufacturing, synergistic knowledge of material properties, durability and function. Hands on activities related to extrusion-compression, fiber spinning, thermoset/thermoplastic materials, medical grade materials, intermediate forms and hybrid manufacturing. Integrated process and product development methodology. Student projects will involve manufacturing processes associated with mass production.

MSE 714. Process Quality Engineering. 3 Hours.
Application of the concepts and tools of total quality to develop, implement, and maintain an effective quality assurance system in a materials processing and manufacturing environment. Students will be exposed to probability models, statistical tools, linear and multiple regression, DOE, TQM and six sigma.

MSE 724. Physical Metallurgy. 3 Hours.
Course will consider the fundamental thermodynamic and kinetic principles governing the behavior of metals and alloys, particularly with respect to their influence the formation and evolution of microstructure. Topics will include liquid-solid and solid-state phase transformations, nucleation, growth, solidification and diffusion.

MSE 725. Plasma Processing of Materials. 3 Hours.
This Online course is designed to introduce the concepts, fundamentals, and applications of plasma surface processing to materials science and engineering students. This is a 3-credit hour graduate level course. This course will feature a primer on plasmas as a unique thermodynamic state of matter. Specifically, there will be an emphasis on non-equilibrium thermal states and how these are used in materials processing and surface engineering. Special topics including plasma generation, control, and diagnostics will be provided. Furthermore, Types of Plasmas, CVD process for polymerization and hard coating, Corona treatment of fibers for composites, spark plasma sintering, plasma- spray coating, etc. surface characterization of plasma-processed surfaces will be discussed in detail: including structure/property relationships, surface morphology (including nanoscale features), and surface chemistry and their relationships to functional surface design. Spectroscopic techniques including x-ray photoelectron spectroscopy (XPS), optical emission spectroscopy (OES) and Surface mechanical properties testing (Nanoindentation) and contact angle measurements. Additional topics will be covered as time in the semester permits. This course will give prospective students a wide coverage of plasma tools and techniques toward functional material design.

MSE 728. Thermal Characterization. 3 Hours.
This lab-oriented course will be focused to give graduate students the theory and hands-on experience in operation, data acquisition and interpretation of widely used thermal characterization techniques such as differential scanning calorimeter (DSC), thermo gravimetric analyzer (TGA) , Simultaneous TGA-DTA, Thermo mechanical analyzer (TMA), Dynamic mechanic analyzer (DMA) and rheological and viscosity analyses of polymeric resins and composite materials. Exposure to TGA combination techniques with chemical analysis (Fourier Transform infrared spectrometer (FT-IR),Gas Chromatography (GC) and Mass spectrometry (MS)).

MSE 728L. Thermal Characterization Lab. 0 Hours.
Laboratory component of MSE 728 and must be taken concurrently.

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Polymer structures and morphology and it's relationships with applications, multicomponent polymer systems (polymer blends, copolymers, micro and nanocomposites), liquid crystalline polymers, polymer crystals, oriented polymers, morphological aspects of deformation and advances in polymers (biomimetic and bioinspired polymer systems).

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Classical lamination theory, analysis and failure of reinforced composite material systems, anisotropic elasticity, stress analysis and design of laminated composites including 3D effects, stress concentrations, free-edge effects, hygrothermal behavior, adhesive and mechanical connections.

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Processing-microstructure-properties of different fibrous materials: natural polymeric fibers (jute, sisal, silk, etc.) synthetic polymeric fibers (aramid and polyethylene, etc.), metallic fibers, and high performance ceramic fibers (alumina and silicon carbide). Application of Weibull statistics to strength of fibrous materials, techniques of mechanical testing of fibers and applications of fibers in various fields.

MSE 738. Degradation of Materials. 3 Hours.
Basics of materials degradation- thermodynamics and kinetics - Pourbaix diagram, chemical and electrochemical reactions; Degradation types and mechanisms; Degradation of different material systems: Metals, alloys, ceramics and glasses, polymers and composites for versatile applications- structural, functional, energy and biomedical; Impact on materials properties; Investigation for materials degradation; Protection from degradation and materials design;Environmental and biological aspects; Societal impact.

MSE 767. Process Modeling/Simulation. 3 Hours.
Theory and practice of analytical methods and computation modeling for manufacturing processes of metals, ceramics, polymers and composites. Applications on processes such as metal cutting, welding, casting, massive forming, solidification, rapid prototyping, injection molding, and resin transfer molding.

MSE 768. Applied Finite Element Analysis. 3 Hours.
Finite Element Analysis (FEA) is used widely for design optimization and failure prediction in automobile, energy, aerospace, and other industries. This course primarily looks at how practically to set up static structural models and get meaningful results. The focus will be on applying loading and boundary conditions, material properties, meshing, convergence, and correct interpretation of results. Students will learn how to set up models using programs such as Solidworks and ANSYS.

MSE 770. Physical Characterization. 3 Hours.
Theory and practice of materials characterization, with emphasis on optical metallography, quantitative metallography, scanning electron microscopy, crystallography, and x-ray diffraction. Specific application in metals and ceramics considered.

MSE 770L. Physical Characterization Lab. 0 Hours.
Laboratory component of MSE 770 and must be taken concurrently.

MSE 790. Special Topics in (Area). 1-6 Hour.
Special Topics In (Area).

MSE 790L. Special Topics in (Area) Laboratory. 0 Hours.
Special Topics in (Area) Laboratory.

MSE 791. Individual Study in (Area). 1-6 Hour.
Individual Study in (Area).

MSE 798. Non-Dissertation Research. 1-12 Hour.

MSE 799. Dissertation Research. 1-12 Hour.
Prerequisites: GAC Z

Materials Engineering

Degrees Offered	MSMtE, Materials Engineering PhD
Website	https://www.uab.edu/engineering/mse/graduate
Program Director	Vinoy Thomas, PhD
Email	vthomas@uab.edu
Phone	(205) 934-8450

Materials engineering involves the development, production, modification, and application of engineering materials to meet the specific needs of society. It is based on an understanding of the structures and forces that control the engineering properties of metals, ceramics, polymers, and composites. Through the development of this understanding, the student learns how to control the properties of materials through various industrial manufacturing processes, how to select the optimum material and predict its behavior under various environmental and service conditions, and how to alter this behavior through materials design, research, and development. Materials Engineers are employed in every major industry, including aerospace, chemical, automotive, metals casting, biomedical, and microelectronics.

Master of Science in Materials Engineering

Admission Requirements

In addition to the general Graduate School admission requirements, requirements for admission to the Master of Science in Materials Engineering (MSMtE) include the following:

1. A baccalaureate degree in materials or metallurgical engineering or in a similarly named engineering program. A student with an undergraduate degree in another field of engineering or in the physical sciences may also be accepted into the MSMtE program.
2. An undergraduate GPA of 3.0 or better on a 4.0 scale on all degree major courses attempted
3. GRE is not required
4. International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details

UAB offers Accelerated Bachelor's / Master's and Early Acceptance. To learn more about these programs, including requirements and how to apply, visit the Graduate School's ALO page.

Early Acceptance

Early Acceptance programs are designed for academically superior high school students. Early Acceptance programs allow high achieving students to be admitted to the Materials Engineering program at the same time they are admitted to an undergraduate program.

Eligible students are required to maintain a 3.5 UAB undergraduate GPA and complete the following per-requisite courses: EGR 265 or MA 227, MSE 280, MSE 281, MSE 380, MSE 381, MSE 382.

For more information about Early Acceptance opportunities, click here.

Accelerated Bachelor's / Master's

students pursuing a BS degree in Materials Engineering at UAB. The following courses are approved for shared credit for students pursuing an ABM in MSE. A successful graduate of ABM will earn both a bachelor's degree and a master's degree in MSE from the University of Alabama at Birmingham in an accelerated timeframe compared to the independent completion of the two degrees.

Graduate courses allowed for credit sharing are: MSE 501, MSE 505, MSE 508, MSE 509 / MSE 509L, MSE 513, MSE 530 / MSE 530L, MSE 533, MSE 545, MSE 562, MSE 564 / MSE 564L, MSE 565 / MSE 565L, MSE 570 / MSE 570L, MSE 574

Preparation Requirements

All students will be required to demonstrate competence at the undergraduate level in engineering materials, physical behavior of materials, thermodynamics, and mechanical behavior of materials as well as in fields of study that emphasize the interrelationship among structure, processing, performance, and properties of materials. Students may be exempted from individual courses or examination if they demonstrate that they possess the knowledge from that course, usually with a grade of a B or better. However, the burden of proof is on the student. He/she may accomplish this by passing a prerequisite examination on the portion of the following course content depending on the student's academic background or by one of the two options be.

This can be accomplished by one of the methods described below.

1. Successful completion (minimum grade of B) of MSE 280 Engineering Materials, MSE 281 Physical Materials I, MSE 380 Thermodynamics of Materials, MSE 381 Physical Materials II, and MSE 382 Mechanical Behavior of Materials;
2. Successful completion (minimum grade of B) of a prerequisite examination on the content of the courses listed above; or
3. Successful completion (minimum grade of B) of MSE 602 Intro to Thermodynamics and Mechanics of Materials and MSE 605 Introduction to Physical Materials

Requirement	Fulfilled By:
Deadline for Entry Term(s)	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office	Seven business days before term begins

Additional Academic Policies

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined hours of Special Topics and/or Independent Study courses will be applied to the MSMtE without appeal to and approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

Plan I (Thesis Option)

The Plan I MSMtE degree requires completion of at least 30 credit hours of graduate work as well as research integrity training according to the following guidelines:

- 12 credit hours of Materials Science and Engineering and no more than 9 credit hours of courses (MSE) at the 500 level. The remaining hours of coursework must be Materials Science and Engineering courses (MSE) at the 602+ level in consultation with the student's thesis committee.
- Up to 6 credit hours of approved mathematics, physical sciences, another engineering discipline or management courses (a maximum of 3 credit hours in a management course is allowed).
- 3 credit hours of MME 601 Mechanical and Materials Engineering Seminar

- Online modules covering the 9 topic areas of Responsible Conduct of Research (RCR) research integrity, which can be accessed online at https://www.citiprogram.org.
- 9 credit hours of after MSE 699 Thesis Research admission to candidacy

A Graduate Thesis Committee consisting of at least three faculty members should be formed. A student is eligible for admission to candidacy after (1) a written thesis proposal following the NSF Proposal Preparation and Submission Guidelines and examination on topics related to the student's research has been orally presented to the committee and approved and (2) completion of Responsible Conduct of Research (RCR) training. Admission to candidacy must take place at least one semester before the student may graduate. A written thesis embodying the results of the student's original research must then be publicly defended, approved by the committee, sent to a department-approved proofreader, and submitted to the Graduate School with edits incorporated.

Plan II (Non-Thesis Option): Research/Design Emphasis

The student must successfully complete at least 33 credit hours of (primarily) materials engineering graduate work including 30 credit hours of courses and 3 credit hours of MSE 698 Non-Thesis Research

- 18-21 credit hours of Materials Science and Engineering and no more than 9 credit hours of courses (MSE) at the 500 level. The remaining hours of coursework must be Materials Science and Engineering courses (MSE) at the 602+ level in consultation with the Program Director.
- 3-6 credit hours of approved mathematics, physical sciences, another engineering discipline or management courses (a maximum of 3 credit hours in a management course is allowed).
- 3 credit hours of MME 601 Mechanical and Materials Engineering Seminar
- Online modules covering the 9 topic areas of Responsible Conduct of Research (RCR) research integrity, which can be accessed online at https://www.citiprogram.org.
- 3 credit hours of MSE 698 Non-Thesis Research, involving an on-site research project (usually taken after completion of all coursework)
- 9 credit hours of after MSE 699 Thesis Research admission to candidacy

Plan II (Non-Thesis Option): Fast Track

This plan is open to undergraduate students in materials engineering within 48 credit hours of graduation with at least 15 credit hours of coursework completed at UAB. The student must successfully complete at least 35 credit hours of (primarily) materials engineering graduate work. Students are expected to complete 6 credit hours of graduate level coursework prior to completing their bachelor degree.

- 15 to 21 credit hours are required within the MSE department at the graduate level
- 9 to 12 credit hours of business related courses – students may focus these courses in several areas: business administration, management, entrepreneurship, or engineering liability/law
- Up to 3 credit hours may be completed by participation in an internship opportunity. This is an option and not a requirement. If internships are conducted for credit, each discipline will have requirements associated with the internship.
- 3 credit hours of MME 601 Mechanical and Materials Engineering Seminar
- The remaining hours must be Materials Science and Engineering courses (MSE) at the 602+ level in consultation with the Program Director

PhD Program

The PhD program in Materials Engineering is offered jointly with the Department of Metallurgical and Materials Engineering at the University of Alabama (Tuscaloosa).

Admission Requirements

In addition to the general Graduate School admission requirements, requirements for admission to the Materials Engineering PhD program include the following:

- A baccalaureate degree in materials or metallurgical engineering or in a similarly named engineering program. A student with an undergraduate degree in another field of engineering or in the physical sciences may also be accepted.
- An undergraduate GPA of 3.0 or better on a 4.0 scale on all degree major courses attempted or junior or senior students in good standing with a minimum GPA of 3.0 on a 4.0 scale in an engineering undergraduate degree program (undergraduate degree must be earned prior to matriculation)
- Personal statement identifying research interest
- CV/Résumé
- 3 recommendations from academic or professional contacts
- Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School (detailed instructions are included during the online application process)
- International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details
- GRE is not required

Preparation Requirements

All students will be required to demonstrate competence at the undergraduate level in engineering materials, physical behavior of materials, thermodynamics, and mechanical behavior of materials as well as in fields of study that emphasize the interrelationship among structure, processing, performance, and properties of materials. Students may be exempted from individual courses or examination if they demonstrate that they possess the knowledge from that course, usually with a grade of a B or better. However, the burden of proof is on the student. He/she may accomplish this by passing a prerequisite examination on the portion of the following course content depending on the student's academic background or by one of the two options be.

This can be accomplished by one of the methods described below.

1. Successful completion (minimum grade of B) of MSE 280 Engineering Materials, MSE 281 Physical Materials I, MSE 380 Thermodynamics of Materials, MSE 381 Physical Materials II, and MSE 382 Mechanical Behavior of Materials;
2. Successful completion (minimum grade of B) of a prerequisite examination on the content of the courses listed above; or

3. Successful completion (minimum grade of B) of MSE 602 Intro to Thermodynamics and Mechanics of Materials and MSE 605 Introduction to Physical Materials

Requirement	Fulfilled By:
Deadline for Entry Term(s)	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office	Seven business days before term begins

Additional Academic Policies

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined hours of Special Topics and/or Independent Study courses will be applied to the PhD without appeal to and approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

Coursework for Students with a BS

It is expected that students entering the PhD program with a BS degree will also earn a Plan II masters degree after completing the required coursework.

PhD students must complete 72 credit hours of (primarily) materials engineering graduate work as a requirement when entering with a BS degree according to the guidelines below:

- A minimum of 48 credit hours of approved graduate coursework in metallurgical engineering, materials engineering, or approved supportive fields. Of 48 credit hours
  - at least 15 credit hours may be at the 700-level MSE courses
  - 3 credit hours of GRD 717 Principles of Scientific Integrity
  - 6 credit hours but no more than 12 must be in supportive fields (a maximum of 6 credit hours can be in management)
  - 3 credit hours of MME 701 Mechanical and Materials Engineering Seminar
  - A student may apply 6 credit hours of MSE 798 Non-Dissertation Research toward the coursework requirement
  - Additional coursework from MSE may be required at the discretion of the dissertation committee; no more than 15 hours of 500-level courses will apply to the degree
- A minimum of 24 credit hours in MSE 799 Dissertation Research after admission to candidacy

Coursework for Students with an MS

The PhD student must complete 51 credit hours of materials engineering graduate work as a requirement when entering with a MS degree in Materials Engineering or a closely related field according to the guidelines below:

- A minimum of 27 credit hours of approved graduate course work in metallurgical engineering, materials engineering, or fields supportive of these
  - at least 15 credit hours may be at the 700-level MSE courses
  - 3 credit hours of GRD 717 Principles of Scientific Integrity
  - 6 credit hours but no more than 12 must be in supportive fields (a maximum of 6 credit hours can be in management)
  - 3 credit hours of MME 701 Mechanical and Materials Engineering Seminar
  - A student may apply 3 credit hours of MSE 798 Non-Dissertation Research toward the coursework requirement
- A minimum of 24 credit hours in MSE 799 Dissertation Research after admission to candidacy

Graduation Requirements

In addition to completing coursework requirements (above), doctoral students must form a Graduate Dissertation Committee consisting of at least five faculty members, one of whom must be from the Department of Metallurgical and Materials Engineering at the University of Alabama (Tuscaloosa). Admission to candidacy must take place at least two semesters before the student may graduate. A student is eligible for admission to candidacy after successfully completing the following:

1. A written examination on topics related to the student's research
2. An oral dissertation proposal
3. A written dissertation proposal (following the NSF Proposal Preparation and Submission Guidelines),
4. Completion of GRD 717 Principles of Scientific Integrity.

A written dissertation embodying the results of the student's original research must then be publicly defended, approved by the committee, sent to a department-approved proofreader, and submitted to the Graduate School with edits incorporated.

Materials Science

Degree Offered	Materials Science PhD
Website	https://www.uab.edu/engineering/mse/graduate/tri-campus-phd-program
Program Director	Vinoy Thomas, PhD
Email	vthomas@uab.edu
Phone	(205) 934-8450

PhD Program

UAB participates in the tri-campus Materials Science PhD program, an interdisciplinary, interdepartmental, and intercampus doctoral program linking the three universities that comprise the University of Alabama System—the University of Alabama (Tuscaloosa), the University of Alabama at Birmingham, and the University of Alabama in Huntsville. This program is separate from the PhD in Materials Engineering offered by UAB's Materials Science and Engineering department, providing flexibility for students who may wish to study materials science while based in another department.

Admission Requirements

In addition to the general Graduate School admission requirements, requirements for admission to the Materials Science PhD program include the following:

- A baccalaureate degree in materials, metallurgical, or ceramics engineering or in a similarly named engineering program. A student with an undergraduate degree in another field of engineering or in the sciences may also be accepted into the Materials Science program.

- An undergraduate GPA of 3.0 or better on a 4.0 scale on all degree major courses attempted
- CV/Résumé
- 3 recommendations from academic or professional contacts
- Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School (detailed instructions are included during the online application process)
- International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details

Additional Academic Policies

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined hours of Special Topics and/or Independent Study courses will be applied to the PhD without appeal to and approval from the Program Director.

UAB offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

Coursework for Students with a BS

It is expected that students entering the PhD program with a BS degree will also earn a Plan II masters degree after completing the required coursework.

For a student entering with a BS degree from an undergraduate program in engineering or the physical sciences, a minimum of 72 credit hours of graduate credit are required according to the following guidelines:

- A minimum of 48 credit hours of approved graduate coursework related to materials science or a supportive field is required
  - No more than 15 hours may be at the 500 level; all remaining credits must be at the 700-level.
  - Because of the broad and interdisciplinary nature of Materials Science, there is no set list of required courses for all students. Students must take at least two courses in each of the three topic areas below (such that the course credits sum to at least 18 credits) within the first 24 months of enrollment. Students must take courses which address the three fundamental areas:
    i. Structure and Properties of Materials (CE 750, CH 783, CH 784, MSE 724, MSE 729, MSE 733, MSE 735, MSE 736, PH 553, PH 554, PH 586, PH 587, PH 753, PH 754)
    ii. Characterization and Testing (BME 535, CH 550, CH 774, MSE 533, MSE 728, MSE 770, PH 732,PH 733, PH 745)
    iii. Thermodynamics and Processing (CH 525, CH 526, MSE 501, MSE 509, MSE 703, MSE 767, MSE 768, PH 510, PH 532, PH 533, PH 635, PH 715, PH 716).
  - At least 6 credit hours must be taken outside the student's home department. This is to ensure that the student achieves an understanding of the multi-disciplinary nature of materials science and must be completed prior to the PhD Dissertation Proposal Examination.
  - Full-time students must successfully complete seminar either in their home department or the MME department a minimum of 4 terms
  - GRD 717 Principles of Scientific Integrity is required for all UAB graduate students and can be counted toward the coursework requirement.
  - A student may apply 6 credit hours of non-dissertation research toward the coursework requirement.
  - Additional coursework may be required at the discretion of the dissertation committee.
- A minimum of 24 credit hours in MSE 799 Dissertation Research dissertation research after admission to candidacy.

Coursework for Students with an MS

Students entering with a master's degree in Materials Science or a closely related field are required to successfully complete a minimum of 51 credit hours of graduate credit according to the following guidelines:

- A minimum of 27 credit hours of approved graduate coursework related to materials science or a supportive field is required
  - No more than 6 hours may be at the 500 level; all remaining credits must be at the 700-level.
  - Because of the broad and interdisciplinary nature of Materials Science, there is no set list of required courses for all students. Students must take at least two courses in each of the three topic areas below (such that the course credits sum to at least 18 credits) within the first 24 months of enrollment. Students must take courses which address the three fundamental areas:
    a. Structure and Properties of Materials (CE 750, CH 783, CH 784, MSE 724, MSE 729, MSE 733, MSE 735, MSE 736, PH 553, PH 554, PH 586, PH 587, PH 753, PH 754)
    b. Characterization and Testing (BME 535, CH 550, CH 774, MSE 533, MSE 728, MSE 770, PH 732, PH 733, PH 745)
    c. Thermodynamics and Processing (CH 525, CH 526, MSE 501, MSE 509, MSE 703, MSE 767, MSE 768, PH 510, PH 532, PH 533, PH 635, PH 715, PH 716).
  - At least 6 credit hours must be taken outside the student's home department. This is to ensure that the student achieves an understanding of the multi-disciplinary nature of materials science and must be completed prior to the PhD Dissertation Proposal Examination.
  - Full-time students must successfully complete seminar either in their home department or the MME department a minimum of 4 terms
  - GRD 717 Principles of Scientific Integrity is required for all UAB graduate students and can be counted toward the coursework requirement.
  - A student may apply 6 credit hours of non-dissertation research toward the coursework requirement.
  - Additional coursework may be required at the discretion of the dissertation committee.
- A minimum of 24 credit hours in MSE 799 Dissertation Research dissertation research after admission to candidacy.

Graduation Requirements

In addition to completing coursework requirements (above), doctoral students must form a Graduate Dissertation Committee consisting of at least five faculty members, the majority of which should be Materials Science faculty. At least one member must be Materials Science faculty from the University of Alabama (Tuscaloosa) or University of Alabama

in Huntsville. Admission to candidacy must take place at least two semesters before the student may graduate. A student is eligible for admission to candidacy after successfully completing the following:

1. A written examination on topics related to the student's research
2. An oral dissertation proposal
3. A written dissertation proposal (following the NSF Proposal Preparation and Submission Guidelines),
4. Completion of GRD 717 Principles of Scientific Integrity.

A written dissertation embodying the results of the student's original research must then be publicly defended, approved by the committee, sent to a department-approved proofreader, and submitted to the Graduate School with edits incorporated.

Courses

MSE 501. Materials Processing. 3 Hours.
Processing of metals, glasses, ceramics, and composites. Powder, casting, welding, rapid solidification, and other advanced approaches.

MSE 505. Frontiers of Automotive Materials. 3 Hours.
Advanced lightweight automotive materials, manufacturing and modeling techniques. Technology advancements in cost-effective carbon, glass and related reinforcements; "green" and sustainable materials, crashworthiness and injury protection of occupants and pedestrians, metal castings, heavy truck, mass transit, fuel cell and hybrid vehicles. Students taking this class will receive a GATE certificate of training in automotive materials technologies upon successful completion.

MSE 508. Nanobiomaterials. 3 Hours.
Basic tools of nanotechnology, building blocks of nanostructured materials. Behavior of materials with nanoscale structures and their technological applications, including automotive, medical, and electronic applications. Introduction to biomaterials and nanobiomaterials, nanotoxicity and how to work safely with nanomaterials. Concepts in tissue engineering with special focus on nanoscaffolds and nanoparticles in drug delivery.

MSE 509. Principles of Metal Casting. 3 Hours.
Production and evaluation of cast ferrous metals (gray iron, ductile iron, steel) and non-ferrous metals (brass, bronze, aluminum). Design of castings and molds. Laboratory on the gating, risering and molten metal treatment, analysis and handling techniques required to produce high quality castings. It is recommended that students who register for this course have successfully completed MSE 280 Engineering Materials or an equivalent course.

MSE 509L. Principles of Metal Casting. 0 Hours.
Laboratory component of MSE 509 and must be taken concurrently.

MSE 513. Composite Materials. 3 Hours.
Processing, structure, and properties of metal-, ceramic-, and polymer-matrix composite materials. Roles of interfacial bond strength, reinforcement type and orientation and matrix selection in physical and mechanical properties of composite materials.

MSE 525. Statistics and Quality. 3 Hours.
This course is arranged to reflect the sequential steps an engineer or scientist take to assess process capability and implement process improvement studies. There is a focus on connecting the theoretical equations to practical examples as well as interpreting and communicating of statistical results.

MSE 530. Polymeric Materials. 3 Hours.
Processing methods, structure/engineering/property relationships, and applications of polymeric materials.

MSE 530L. Polymeric Materials Lab. 0 Hours.
Laboratory component of MSE 530 and must be taken concurrently.

MSE 533. Nondestructive Evaluation of Materials. 3 Hours.
Principles, applications, and limitations of ultrasonic vibrations, acoustic emission, radiographic, magnetic particle, eddy current, and other nondestructive testing methods. Intelligent sensors and health monitoring of real structures.

MSE 545. The Evolution of Engineering Materials. 3 Hours.
Past, present and future of engineering materials; how new materials and processing methods have impacted human society, from the Stone Age until today. Taught as a 3-week study abroad course in Germany, with visits to universities, industrial facilities, research labs, museums and selected cultural sites.

MSE 562. Composites Manufacturing. 3 Hours.
Principles of manufacturing and processing of polymeric matrix composites. Production techniques including filament winding, pultrusion, and liquid infusion techniques combined with design, environmental and manufacturing issues of polymer matrix composites.

MSE 564. Metals and Alloys. 4 Hours.
Microstructures, properties, heat treatment, and processing of ferrous and nonferrous materials.

MSE 564L. Metals and Alloys Lab. 0 Hours.
Laboratory component of MSE 564 and must be taken concurrently.

MSE 565. Characterization of Materials. 4 Hours.
Theory and practice of materials characterization, with emphasis on optical metallography, quantitative metallography, scanning electron microscopy, crystallography, and x-ray diffraction. Specific application in metals and ceramics considered.

MSE 565L. Characterization of Materials Laboratory. 0 Hours.
Laboratory component of MSE 565 and must be taken concurrently with MSE 565.

MSE 570. Ceramic Materials. 4 Hours.
Structure, processing, properties, and uses of ceramic compounds and glasses. Mechanical, thermal, and electrical behavior of ceramic materials in terms of microstructure and processing variables.

MSE 570L. Ceramic Materials Laboratory. 0 Hours.
Laboratory component of MSE 570 and must be taken concurrently.

MSE 574. Metals and Alloys II. 3 Hours.
Production and physical metallurgy of ferrous and non-ferrous alloys including: steel alloys, inoculation and production of ductile, gray, compacted and malleable iron; advanced heat treatments of steel and iron; conventional and ultra-high strength aluminum alloys; wrought and cast copper alloys; wrought and cast magnesium alloys.

MSE 590. Special Topics in Materials Science & Engineering. 1-3 Hour.
Special Topics in Materials Science & Engineering.

MSE 591. Individual Study in Materials Science & Engineering. 1-6 Hour.
Individual Study in Materials Science & Engineering.

MSE 601. Materials Science and Engineering Seminar. 0 Hours.
Seminar focusing on student research and guest presentations of various topics of interest to materials students.

MSE 602. Intro to Thermodynamics and Mechanics of Materials. 3 Hours.
This course is a survey of undergraduate level theory and application of the fundamental principles of mechanics of materials and thermodynamics. Understanding is based on the explanation of the physical behavior of materials under load and then modeling this behavior to develop the theory. Intended to provide the students with both the theory and application of the fundamental principles of thermodynamics of materials. Students must be graduate student in engineering, chemistry or physics.

MSE 603. Thermodynamics of Materials. 3 Hours.
Atomistic and classical approaches to the understanding of the thermodynamics of solids, phase transformations, chemical reactions, and alloy systems.

MSE 605. Introduction to Physical Materials. 3 Hours.
Overview of fundamental concepts of materials science and engineering, focusing on chemical and physical properties such as bonding, crystal structure and defects, diffusion, and phase diagrams.

MSE 606. Introduction to Manufacturing Engineering. 3 Hours.
Manufacturing is the process of transforming raw materials into products. Even the most optimized and controlled industrial processes are fraught with variability and inefficiencies, both of which can have a negative impact on profitability. This course will introduce students to the proven tools to characterize and optimize industrial processes. In addition, students will learn the statistical techniques to quantitative assess and detect changes to a process and make data-driven decisions to improve that process.

MSE 607. Measurement Systems Analysis. 3 Hours.
Whether in a manufacturing process, research & development lab or quality control, assessment and analysis of data used for decision making has roots in the equipment and procedures that make up a measurement system. Students will learn to critically assess the capability of measurements systems, gauges and analytical equipment used to collect data. Students will learn metrology, best practices, and statistical tools to quantitatively assess, as well as procedures to implement a Gage R&R study to improve a measurement system. In addition, students will learn effective communication strategies for presenting the results of statistical analysis.

MSE 608. Process Characterization and Advanced Statistical Analysis. 3 Hours.
This course centers on manufacturing processes and the inherent variability of all products. Product variability has origins at all input points in a process; raw materials, energy, time, human, etc. This course will expose engineers to the statistics to quantify and assess variability. In addition to statistical tools, we will delve deep into all phases of the DMAIC (Define, Measure, Analysis, Improve, and Control) methodology and the Lean/Six Sigma tools to identify, implement and document process improvements. An emphasis will be placed on the communication of these often-complicated statistics in an industrial setting. We will put these concepts into practice through completion of a final term paper. Students will be required to choose an industrial process and apply and communicate the concepts learned in this course.

MSE 610. Advanced Materials, Manufacturing and Applications Development. 3 Hours.
Introduction to advanced materials by design, near net-shape cost-effective manufacturing, synergistic knowledge of material properties, durability and function. Hands on activities related to extrusion-compression, fiber spinning, thermoset/thermoplastic materials, medical grade materials, intermediate forms and hybrid manufacturing. Integrated process and product development methodology. Student projects will involve manufacturing processes associated with mass production.

MSE 613. Mechanical Behavior of Materials. 3 Hours.
Microstructural effects on the deformation mechanisms responsible for mechanical behavior of engineering materials.

MSE 614. Process Quality Engineering. 3 Hours.
Application of the concepts and tools of total quality to develop, implement, and maintain an effective quality assurance system in a materials processing and manufacturing environment. Students will be exposed to probability models, statistical tools, linear and multiple regression, DOE, TQM and six sigma.

MSE 624. Physical Metallurgy. 3 Hours.
Course will consider the fundamental thermodynamic and kinetic principles governing the behavior of metals and alloys, particularly with respect to their influence the formation and evolution of microstructure. Topics will include liquid-solid and solid-state phase transformations, nucleation, growth, solidification and diffusion.

MSE 625. Plasma Processing of Materials. 3 Hours.
This Online course is designed to introduce the concepts, fundamentals, and applications of plasma surface processing to materials science and engineering students. This is a 3-credit hour graduate level course. This course will feature a primer on plasmas as a unique thermodynamic state of matter. Specifically, there will be an emphasis on non-equilibrium thermal states and how these are used in materials processing and surface engineering. Special topics including plasma generation, control, and diagnostics will be provided. Furthermore, Types of Plasmas, CVD process for polymerization and hard coating, Corona treatment of fibers for composites, spark plasma sintering, plasma- spray coating, etc. surface characterization of plasma-processed surfaces will be discussed in detail: including structure/property relationships, surface morphology (including nanoscale features), and surface chemistry and their relationships to functional surface design. Spectroscopic techniques including x-ray photoelectron spectroscopy (XPS), optical emission spectroscopy (OES) and Surface mechanical properties testing (Nanoindentation) and contact angle measurements. Additional topics will be covered as time in the semester permits. This course will give prospective students a wide coverage of plasma tools and techniques toward functional material design.

MSE 628. Thermal Characterization. 3 Hours.
This lab-oriented course will be focused to give graduate students the theory and hands-on experience in operation, data acquisition and interpretation of widely used thermal characterization techniques such as differential scanning calorimeter (DSC), thermo gravimetric analyzer (TGA) , Simultaneous TGA-DTA, Thermo mechanical analyzer (TMA), Dynamic mechanic analyzer (DMA) and rheological and viscosity analyses of polymeric resins and composite materials. Exposure to TGA combination techniques with chemical analysis (Fourier Transform infrared spectrometer (FT-IR), Gas Chromatography (GC) and Mass spectrometry (MS)).

MSE 628L. Thermal Characterization Lab. 0 Hours.
Laboratory component of MSE 628 and must be taken concurrently.

MSE 629. Polymer Structure and Morphology. 3 Hours.
Polymer structures and morphology and it's relationships with applications, multicomponent polymer systems (polymer blends, copolymers, micro and nanocomposites), liquid crystalline polymers, polymer crystals, oriented polymers, morphological aspects of deformation and advances in polymers (biomimetic and bioinspired polymer systems).

MSE 633. Advanced Mechanics of Deformation. 3 Hours.
Basics and intermediate mechanics of deflection of beams and columns, mechanics of impact, failure theories, plastic deformation of materials, fracture mechanics, fatigue, creep and vibration. The topics will be supported by industry relevant case studies. Suggested prerequisites included Mechanics of Solids (CE 220) and Mechanical Behavior (MSE 382).

MSE 635. Advanced Mechanics of Composites. 3 Hours.
Classical lamination theory, analysis and failure of reinforced composite material systems, anisotropic elasticity, stress analysis and design of laminated composites including 3D effects, stress concentrations, free-edge effects, hygrothermal behavior, adhesive and mechanical connections.

MSE 636. Engineering Fibers. 3 Hours.
Processing-microstructure-properties of different fibrous materials: natural polymeric fibers (jute, sisal, silk, etc.), synthetic polymeric fibers (aramid and polyethylene, etc.), metallic fibers, and high performance ceramic fibers (alumina and silicon carbide). Application of Weibull statistics to strength of fibrous materials, techniques of mechanical testing of fibers and applications of fibers in various fields.

MSE 638. Degradation of Materials. 3 Hours.
Basics of materials degradation- thermodynamics and kinetics - Pourbaix diagram, chemical and electrochemical reactions; Degradation types and mechanisms; Degradation of different material systems: Metals, alloys, ceramics and glasses, polymers and composites for versatile applications- structural, functional, energy and biomedical; Impact on materials properties; Investigation for materials degradation; Protection from degradation and materials design;Environmental and biological aspects; Societal impact.

MSE 667. Process Modeling/Simulation. 3 Hours.
Theory and practice of analytical methods and computational modeling for manufacturing processes of metals, ceramics, polymers and composites. Applications on processes such as metal cutting, welding, casting, massive forming, solidification, rapid prototyping, injection molding and resin transfer molding.

MSE 668. Applied Finite Element Analysis. 3 Hours.
Finite Element Analysis (FEA) is used widely for design optimization and failure prediction in automobile, energy, aerospace, and other industries. This course primarily looks at how practically to set up static structural models and get meaningful results. The focus will be on applying loading and boundary conditions, good meshes, convergence of results, and correct interpretation of results. Students will learn how to set up models using programs such as Pro/Engineer and ANSYS.

MSE 670. Physical Characterization. 3 Hours.
Theory and practice of materials characterization, with emphasis on optical metallography, quantitative metallography, scanning electron microscopy, crystallography, and x-ray diffraction. Specific application in metals and ceramics considered.

MSE 670L. Physical Characterization Lab. 0 Hours.
Laboratory component of MSE 670 and must be taken concurrently.

MSE 690. Special Topics In (Area). 1-6 Hour.
Special Topics in (Area).

MSE 690L. Special Topics in (Area) Laboratory. 0 Hours.
Special Topics in (Area) laboratory.

MSE 691. Individual Study in (Area). 1-6 Hour.
Individual Study in (Area).

MSE 698. Non-Thesis Research. 1-12 Hour.

MSE 699. Thesis Research. 1-12 Hour.
Prerequisites: GAC M

MSE 701. Materials Science and Engineering Seminar. 0 Hours.
Seminar focusing on student research and guest presentations of various topics of interest to materials students.

MSE 702. Intro to Thermodynamics and Mechanics of Materials. 3 Hours.
This course is a survey of undergraduate level theory and application of the fundamental principles of mechanics of materials and thermodynamics. Understanding is based on the explanation of the physical behavior of materials under load and then modeling this behavior to develop the theory. Intended to provide the students with both the theory and application of the fundamental principles of thermodynamics of materials. Students must be graduate student in engineering, chemistry or physics.

MSE 703. Thermodynamics of Materials. 3 Hours.
Atomistic and classical approaches to the understanding of the thermodynamics of solids, phase transformations, chemical reactions, and alloy systems.

MSE 705. Introduction to Physical Materials. 3 Hours.
Overview of fundamental concepts of materials science and engineering, focusing on chemical and physical properties such as bonding, crystal structure and defects, diffusion, and phase diagrams.

MSE 710. Advanced Materials, Manufacturing and Applications Development. 3 Hours.
Introduction to advanced materials by design, near net-shape cost-effective manufacturing, synergistic knowledge of material properties, durability and function. Hands on activities related to extrusion-compression, fiber spinning, thermoset/thermoplastic materials, medical grade materials, intermediate forms and hybrid manufacturing. Integrated process and product development methodology. Student projects will involve manufacturing processes associated with mass production.

MSE 714. Process Quality Engineering. 3 Hours.
Application of the concepts and tools of total quality to develop, implement, and maintain an effective quality assurance system in a materials processing and manufacturing environment. Students will be exposed to probability models, statistical tools, linear and multiple regression, DOE, TQM and six sigma.

MSE 724. Physical Metallurgy. 3 Hours.
Course will consider the fundamental thermodynamic and kinetic principles governing the behavior of metals and alloys, particularly with respect to their influence the formation and evolution of microstructure. Topics will include liquid-solid and solid-state phase transformations, nucleation, growth, solidification and diffusion.

MSE 725. Plasma Processing of Materials. 3 Hours.
This Online course is designed to introduce the concepts, fundamentals, and applications of plasma surface processing to materials science and engineering students. This is a 3-credit hour graduate level course. This course will feature a primer on plasmas as a unique thermodynamic state of matter. Specifically, there will be an emphasis on non-equilibrium thermal states and how these are used in materials processing and surface engineering. Special topics including plasma generation, control, and diagnostics will be provided. Furthermore, Types of Plasmas, CVD process for polymerization and hard coating, Corona treatment of fibers for composites, spark plasma sintering, plasma- spray coating, etc. surface characterization of plasma-processed surfaces will be discussed in detail: including structure/property relationships, surface morphology (including nanoscale features), and surface chemistry and their relationships to functional surface design. Spectroscopic techniques including x-ray photoelectron spectroscopy (XPS), optical emission spectroscopy (OES) and Surface mechanical properties testing (Nanoindentation) and contact angle measurements. Additional topics will be covered as time in the semester permits. This course will give prospective students a wide coverage of plasma tools and techniques toward functional material design.

MSE 728. Thermal Characterization. 3 Hours.
This lab-oriented course will be focused to give graduate students the theory and hands-on experience in operation, data acquisition and interpretation of widely used thermal characterization techniques such as differential scanning calorimeter (DSC), thermo gravimetric analyzer (TGA) , Simultaneous TGA-DTA, Thermo mechanical analyzer (TMA), Dynamic mechanic analyzer (DMA) and rheological and viscosity analyses of polymeric resins and composite materials. Exposure to TGA combination techniques with chemical analysis (Fourier Transform infrared spectrometer (FT-IR),Gas Chromatography (GC) and Mass spectrometry (MS)).

MSE 728L. Thermal Characterization Lab. 0 Hours.
Laboratory component of MSE 728 and must be taken concurrently.

MSE 729. Polymer Structure and Morphology. 3 Hours.
Polymer structures and morphology and it's relationships with applications, multicomponent polymer systems (polymer blends, copolymers, micro and nanocomposites), liquid crystalline polymers, polymer crystals, oriented polymers, morphological aspects of deformation and advances in polymers (biomimetic and bioinspired polymer systems).

MSE 733. Advanced Mechanics of Deformation. 3 Hours.
Basics and intermediate mechanics of deflection of beams and columns, mechanics of impact, failure theories, plastic deformation of materials, fracture mechanics, fatigue, creep and vibration. The topics will be supported by industry relevant case studies. Suggested prerequisites included Mechanics of Solids (CE 220) and Mechanical Behavior (MSE 382).

MSE 735. Advanced Mechanics of Composites. 3 Hours.
Classical lamination theory, analysis and failure of reinforced composite material systems, anisotropic elasticity, stress analysis and design of laminated composites including 3D effects, stress concentrations, free-edge effects, hygrothermal behavior, adhesive and mechanical connections.

MSE 736. Engineering Fibers. 3 Hours.
Processing-microstructure-properties of different fibrous materials: natural polymeric fibers (jute, sisal, silk, etc.) synthetic polymeric fibers (aramid and polyethylene, etc.), metallic fibers, and high performance ceramic fibers (alumina and silicon carbide). Application of Weibull statistics to strength of fibrous materials, techniques of mechanical testing of fibers and applications of fibers in various fields.

MSE 738. Degradation of Materials. 3 Hours.
Basics of materials degradation- thermodynamics and kinetics - Pourbaix diagram, chemical and electrochemical reactions; Degradation types and mechanisms; Degradation of different material systems: Metals, alloys, ceramics and glasses, polymers and composites for versatile applications- structural, functional, energy and biomedical; Impact on materials properties; Investigation for materials degradation; Protection from degradation and materials design;Environmental and biological aspects; Societal impact.

MSE 767. Process Modeling/Simulation. 3 Hours.
Theory and practice of analytical methods and computation modeling for manufacturing processes of metals, ceramics, polymers and composites. Applications on processes such as metal cutting, welding, casting, massive forming, solidification, rapid prototyping, injection molding, and resin transfer molding.

MSE 768. Applied Finite Element Analysis. 3 Hours.
Finite Element Analysis (FEA) is used widely for design optimization and failure prediction in automobile, energy, aerospace, and other industries. This course primarily looks at how practically to set up static structural models and get meaningful results. The focus will be on applying loading and boundary conditions, material properties, meshing, convergence, and correct interpretation of results. Students will learn how to set up models using programs such as Solidworks and ANSYS.

MSE 770. Physical Characterization. 3 Hours.
Theory and practice of materials characterization, with emphasis on optical metallography, quantitative metallography, scanning electron microscopy, crystallography, and x-ray diffraction. Specific application in metals and ceramics considered.

MSE 770L. Physical Characterization Lab. 0 Hours.
Laboratory component of MSE 770 and must be taken concurrently.

MSE 790. Special Topics in (Area). 1-6 Hour.
Special Topics In (Area).

MSE 790L. Special Topics in (Area) Laboratory. 0 Hours.
Special Topics in (Area) Laboratory.

MSE 791. Individual Study in (Area). 1-6 Hour.
Individual Study in (Area).

MSE 798. Non-Dissertation Research. 1-12 Hour.

MSE 799. Dissertation Research. 1-12 Hour.
Prerequisites: GAC Z

Mechanical Engineering

Degree Offered:	Master of Science in Mechanical Engineering
Website:	https://www.uab.edu/engineering/mme/graduate/ms-mechanical
Director:	David Littlefield, PhD
Phone:	(205) 975-5882
E-mail:	littlefield@uab.edu

Mechanical engineering is a broad-based discipline, and graduate students will have opportunities to explore a number of research areas where they will work alongside nationally and internationally known faculty mentors. The ME department offers a Master of Science in Mechanical Engineering degree, including both Thesis and Non-Thesis options.

Additional Information

Deadline for Entry Term(s):	Fall: August 1; Spring: December 1; Summer: Mayl 1
Deadline for All Application Materials to be in the Graduate School Office:	Six weeks before term begins

Master of Science in Mechanical Engineering Admissions Requirements

- A bachelor's degree from an accredited (or equivalent) program in engineering or the physical sciences is required for admission to graduate study in mechanical engineering with not less than B-level scholarship overall or over the last 60 semester hours of earned credit.
- International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details
- Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School (detailed instructions are included during the online application process)

A student with an undergraduate degree in a field of engineering other than mechanical or in the physical sciences may also be accepted into the mechanical engineering program. However, such a student will normally have to take additional, preparatory coursework as part of an expanded plan of study (see "Preparatory Courses" later in this section).

Special Topics (590/690/790) courses and Independent Study (591/691/791) courses are reviewed for degree applicability for each program in the School of Engineering. No more than 6 combined hours of Special Topics and/or Independent Study courses will be applied to the degree without appeal to and approval from the Program Director.

The School of Engineering offers similar courses at the 400/500 and 600/700 levels. While the higher numbered course has more advanced content, there is a significant overlap in topics. Therefore, students are not allowed to take a 500-level or 700-level course for credit if they have previously taken the related 400-level or 600-level course, respectively.

UAB offers Accelerated Bachelor's / Master's and Early Acceptance. To learn more about these programs, including requirements and how to apply, visit the Graduate School's ALO page.

Accelerated Bachelor's / Master's

Mechanical Engineering offers an accelerated Bachelor's / Master's (ABM) option for high-achieving undergraduate students pursuing a BS degree in Mechanical Engineering at UAB. The following courses are approved for shared credit for students pursuing an ABM in ME. A successful graduate of ABM will earn both a bachelor's degree and a master's degree in ME from the University of Alabama at Birmingham in an accelerated time-frame compared to the independent completion of the two degrees.

Graduate courses allowed for credit sharing are: ME 511, ME 521, ME 530, ME 531, ME 532, ME 545, ME 547, ME 549, ME 554, ME 555, ME 556, ME 564, ME 575, ME 577, ME 578, ME 580.

Plan I (Thesis Option)

1. Upon admission to the program, the Graduate Program Director will advise the student on courses for the first semester. During the first semester, the student will be assigned a Committee Chair, based on research interest, who will assist the student in forming their graduate study committee. The committee will consist of the Chair and two graduate faculty members with experience or expertise related to the student's thesis topic. The Chair, in coordination with the committee, will aid the student in course selection.
2. In addition to the general Graduate School requirements, the student must successfully complete at least 24 semester hours of coursework, including:
   - 6 semester hours in committee-approved mathematics courses
   - 18 semester hours in committee-approved mechanical engineering courses or approved related courses, including at least 2 semester hours of MME 601 Mechanical and Materials Engineering Seminar and 3 semester hours in a course outside the student's research or specialization area.
3. A student is eligible for admission to candidacy after (1) a written thesis has been orally presented to and approved by the committee and (2) successful completion of Responsible Conduct in Research training.
4. After admission to candidacy, the student must register for at least 6 hours of ME 699 Thesis Research in addition to the 24 semester hours of coursework.
5. The student must successfully complete and defend a thesis.

Plan II (Non-thesis Option)

Generally, Plan II will be approved for students working full-time and attending UAB on a part-time basis or when the student demonstrates that Plan II offers superior educational benefits. After 15 credit hours of coursework are completed, the student should select a project director and begin work on the final project. The election of Plan II must be approved by the student's graduate advisor.

1. The student must successfully complete at least 33 semester hours of coursework, including:
   - 6 semester hours in approved mathematics courses
   - A minimum of 27 semester hours in approved mechanical engineering courses or approved related courses. Of these 27 semester hours, students must enroll in:
     - at least 3 semester hours in a course outside the student's research or specialization area
     - at least 2 semester hours of MME 601 Mechanical and Materials Engineering Seminar
     - at least 3 hours of ME 698 Non-Thesis Research involving design or research
2. The student must make a presentation on the research project and submit a final report which must be approved by the project director.

Early Acceptance

Early Acceptance Programs are designed for academically superior high school students. Early Acceptance Programs allow high-achieving

students to be conditionally admitted into a graduate program at the same time they are admitted to an undergraduate program.

Eligible students are required to maintain a 3.50 undergraduate GPA and complete the following prerequisite courses: ME 241, ME 321, ME 364, and ME 371.

Preparatory Courses

The following courses and their prerequisites are required preparation for the graduate program in mechanical engineering. Students will be required to successfully complete the courses below or present equivalent prior coursework. Additional courses may be required depending on the research interest.

Requirements		Hours
ME 241	Thermodynamics I	3
ME 321	Introduction to Fluid Mechanics	3
ME 322	Introduction to Heat Transfer	3
ME 360	Introduction to Mechatronic Systems Engineering	3
ME 370	Kinematics and Dynamics of Machinery	3
ME 371	Machine Design	3
CE 220	Mechanics of Solids	3

Degree Offered	Mechanical Engineering PhD
Website	https://www.uab.edu/engineering/mme/graduate/phd-mechanical-engineering
Program Director	David L. Littlefield, PhD
Email	littlefield@uab.edu

Program Objectives

The PhD in Mechanical Engineering degree program prepares students to become productive engineering researchers in industry, academia, government, or other organizations. Students will be equipped with the skills necessary to define, formulate and solve novel problems in the mechanical engineering field. The program emphasizes the mechanical engineering sciences with a strong foundation in mathematics. Graduates will be well prepared for research roles to serve their organizations, their communities, and contribute to the UAB mission of having an economic impact in the region.

Graduates will be well prepared for positions as academic, government and industrial researchers. They will be equipped with the knowledge and skills to develop quality research proposals and carry out research to develop new and innovative theories, models, products and ideas in mechanical engineering intended to advance the state-of-the-art. Entry-level roles at academic institutions would include assistant professor or research engineer, and in government and industry research engineer or laboratory associate. Graduates will also be well prepared to compete for post-doctoral studies at other universities and laboratories across the world.

Students in the Mechanical Engineering PhD program will:

- Develop the ability to identify, formulate and solve complex Mechanical Engineering problems by applying principles of engineering, science and mathematics.
- Be able to explain experimental/theoretical approaches and limitations associated with his/her dissertation project.
- Be able to summarize the relevant literature, identify its limitations, and formulate an original research plan.
- Be able to communicate and defend his/her research results and conclusions in oral and written form.

Admission Requirements

Admission decisions are made on the basis of prior education, GPA, test scores, personal statement, professional experience, and recommendations.

In addition to the Graduate School admission requirements, admission to the Mechanical Engineering PhD program includes the following:

- Undergraduate or graduate degree in Mechanical Engineering or related engineering field from an ABET (or equivalent) accredited program. Applicants who do not meet this criterion but who have an outstanding academic record in a related field outside of engineering may be admitted, but will be required to complete a sequence of undergraduate courses (including prerequisites as appropriate) in addition to the normal requirements of the ME PhD degree
- Minimum GPA of 3.0 on a 4.0 scale for most recent degree
- GRE is not required
- Personal statement identifying research interest
- CV/Résumé
- 3 academic or professional recommendations
- International applicants must submit English proficiency scores in accordance with UAB Graduate School requirement. Click here for details
- Original transcripts from all colleges and universities attended since high school must be sent directly to the UAB Graduate School (detailed instructions are included during the online application process);

Entry Term	Deadline
Deadline for Entry Term(s)	Fall: August 1; Spring: December 1; Summer: May 1
Deadline for All Application Materials to be in the Graduate School Office	Seven days before term begins

Degree Requirements

Graduate Committee

The graduate study committee (dissertation committee) is an important part of the student's program. The committee will oversee the selection of courses and direction of research. Students must form a graduate committee within the first year of study and must meet with the committee no less than once per academic year. Committees must have at least five members. A minimum of three committee members must have a primary appointment in the School of Engineering. It is recommended that at least one committee member have an appointment outside of the engineering field.

Coursework

The ME PhD promotes a research-based curriculum with a set of core courses required of all students in the program. Additional coursework is directed by the student's graduate study committee based on the student's area of interest.

Students entering the PhD program with a baccalaureate degree must, in keeping with UAB Graduate School policies, complete at least 48 hours of coursework prior to admission to candidacy. Up to 16 of the 48

credits can be non-dissertation research, and up to 10 credits can be a combination of laboratory rotations, seminars, and directed study.

Students entering the PhD program with a Master's degree in ME or a related field must complete at least 27 credit hours of coursework prior to candidacy. Up to 6 credits of the 27 can be non-dissertation research credits, and up to 6 credits can be as lab rotations, seminars, or directed study credits.

For all students, at least 24 hours of dissertation research are required and must be taken over at least two semesters after admission to candidacy.

Curriculum

Requirements		Hours
Requirements		
GRD 717	Principles of Scientific Integrity	3
ME 661	Math Methods in EGR I	3
ME 662	Math Methods in EGR II	3
ME 799	Dissertation Research (Program Electives) [2]	24
MME 601	Mechanical and Materials Engineering Seminar	1
Program Electives [3, 4]		35
Total Hours		**69**

1. 4 enrollments of 1 hour each; Students may substitute a different graduate-level seminar/journal club with permission of his/her faculty mentor and the program director
2. Dissertation hours must be taken over a minimum of 2 terms
3. Elective options include: ME 511, ME 521, ME 530, ME 531, ME 547, ME 575, ME 580, ME 611, ME 613, ME 614, ME 615, ME 650, ME 665, ME 670, ME 672, ME 677, ME 679, ME 688, ME 731, ME 732, ASEM 610, ASEM 611, ASEM 612, ASEM 613, ASEM 615, ASEM 617, ASEM 628, MSE 635
4. Students who have earned a Master of Science in Mechanical Engineering are required to successfully complete 14 credit hours of electives from the list above

In addition to the ME PhD program core courses (above), course selection is based on the research and career goals of the student, and curricula will vary between students. Students are guided by their faculty mentor (committee chair) and a graduate study committee composed of faculty representing a transdisciplinary team in the student's area of research interest. Non-dissertation research and dissertation research hours will be taken through the department of the student's faculty mentor.

Specifics of coursework would be tailored to the individual research thrusts of the student and may differ from the lists given below. While no formal options/concentrations are listed as part of the program, the specifics of the student's curriculum (beyond the core requirements) will be tailored to the individual. Please contact the program director for more information about specific areas of specialization.

Courses

ME 511. Intermediate Fluid Mechanics. 3 Hours.
Applications of fluid dynamic principles to engineering flow problems such as turbo-machinery flow and one-dimensional compressible flow. Vorticity, potential flow, viscous flow, Navier-Stokes solutions, and boundary layers. Introduction to Fluid Mechanics or equivalent is a recommended prerequisite for this course.

ME 521. Introduction to Computational Fluid Dynamics Basics. 3 Hours.
Governing equations for fluid flows, classifications of flow regimes, and approaches to analyze fluid flow problems. Introduction to Computational Fluid Dynamics (CFD), mesh generation, boundary conditions, numerical solution of equations governing fluid flows, and visualization. Hands-on exercises using a commercial CFD solver.

ME 530. Vehicular Dynamics. 3 Hours.
Introduction to the fundamentals of mechanics and analytical methods for modeling vehicle dynamics and performance. Topics include tire-road interaction modeling, vehicle longitudinal dynamics and traction performance, lateral dynamics, handling, stability of motion and rollover, as well as, contribution of the drivetrain system, steering system and suspension configurations to the dynamics of a vehicle. Software applications, projects, and exposure to hardware and systems are used to reinforce concepts. Dynamics or equivalent is a recommended prerequisite for this course.

ME 531. Introduction to Vehicle Drive Systems Engineering. 3 Hours.
Engineering fundamentals of mechanical and mechatronic, hybrid-electric, and electric drive systems. Applications to passenger cars and commercial vehicles. Drive system and component design, including main clutches and torque converters, transmissions, transfer cases, and drive axles. Introduction to plug-in hybrid-electric vehicles. Students registering for this course should have successfully completed (grade C or better) ME 215 Dynamics and ME 370 Kinematics and Dynamics of Machinery or equivalents.
Prerequisites: ME 215 [Min Grade: C] and ME 370 [Min Grade: C](Can be taken Concurrently)

ME 532. Introduction to Electric Vehicles. 3 Hours.
Introduction to fully electric and hybrid vehicle engineering. Mechatronic system and component design. Batteries and energy storage devices. Plug-in hybrid electric vehicles.

ME 545. Combustion. 3 Hours.
Evaluation of the impact of fuel characteristics and operating conditions on the performance of coal-fired electric utility steam-raising plant and the prospects for continued reliance on coal as fuel for electric power generation. The phenomena emphasized are the behavior of turbulent jets; ignition, devolatilization and combustion of coal particles; radiative heat transfer and the effect of ash deposits on heat transfer; formation of air pollutants and their removal from combustion products; integrated gasification combined cycle; and capture and sequestration of carbon dioxide. Thermodynamics II, Introduction to Fluid Mechanics, and Introduction to Heat Transfer or equivalents are recommended prerequisites for this course.

ME 547. Internal Combustion Engines. 3 Hours.
Fundamentals of reciprocating internal combustion engines: engine types, engine components, engine design and operating parameters, thermochemistry of fuel-air mixtures, properties of working fluids, ideal models of engine cycles, engine operating characteristics, gas-exchange processes, fuel metering, charge motion within the cylinder, combustion in spark-ignition and compression ignition engines.

ME 549. Power Generation. 3 Hours.
Application of thermodynamics, fluid mechanics, and heat transfer to conversion of useful energy. Includes terrestrial and thermodynamic limitations, fossil fuel power plants, renewable energy sources, and direct energy direct energy conversion. Thermodynamics II or equivalent is a recommended prerequisite for this course.

ME 554. Heating, Ventilating, & AC. 3 Hours.
Fundamentals and practice associated with heating, ventilating, and air conditioning; study of heat and moisture flow in structures, energy consumption, and design of practical systems. Introduction to Heat Transfer or equivalent is a recommended prerequisite for this course.

ME 555. Thermal-Fluid Systems Design. 3 Hours.
Comprehensive design problems requiring engineering decisions and code/Standard compliance. Emphasis on energy system components: piping networks, pumps, heat exchangers. Includes fluid transients and system modeling. Introduction to Heat Transfer is a recommended prerequisite for this course.

ME 556. Building Energy Modeling and Analysis. 3 Hours.
Computer modeling of energy use and thermal comfort in buildings using several software tools. Interpretation and analysis of the results. Implementing energy efficiency measures in the model and studying the effects on energy use. Students registering for this course should have successfully completed (grade of C or better) ME 242 Thermodynamics II and ME 322 Introduction to Heat Transfer or equivalents.

ME 564. Introduction to Finite Element Method. 3 Hours.
Concepts and applications of finite element method. Development and applications of basic elements used in engineering mechanics. Use of finite element analysis software. Application of finite element concept to several areas of mechanics. Mechanics of Solids or equivalent is a recommended prerequisite for this course.

ME 575. Mechanical Vibrations. 3 Hours.
Development of equations of motion for free and forced single-degree-of-freedom (SDOF) systems. Multi-degree-of-freedom systems. Transient response, support motion and vibration isolation for SDOFs. Vibration absorbers, generalized mass and stiffness, orthogonality of normal modes, and root solving and Gauss elimination procedures. Chelosky decomposition and Jacobi diagonalization methods.

ME 577. Systems Engineering. 3 Hours.
Exposure to the field of systems engineering, mission design, requirements development, trade studies, project life cycle, system hierarchy, risk analysis, cost analysis, team organization, design fundamentals, work ethics, compare and evaluate engineering alternatives, systems thinking.

ME 578. Automated Manufacturing. 3 Hours.
Introduction to automated manufacturing technology. Components of automated systems (controllers, sensors and actuators) and automated manufacturing sub-systems (3D printer, CNC, robot and computer vision) will be studied in a lecture\lab environment with hands on activities. A basic understanding of engineering graphics and computer methods at the undergraduate level is required for this course.

ME 580. Instrumentation and Measurements. 3 Hours.
Thorough exploration of fundamental measurement concepts and techniques for data acquisition and validation. Explanation of important selection criteria for the identification and configuration of commercially available data acquisition devices. Students will get hands on experience following best practices for data acquisition (high speed vs low speed) relevant to their field of study or career. Many types of sensors, their underlying technology, and measurement techniques will be discussed (i.e. accelerometers, load cells, Digital Image Correlation, etc.) to demonstrate best practices for sensor selection for a wide range of specialized applications.

ME 590. Special Topics in Mechanical Engineering. 1-3 Hour.
Special Topics in Mechanical Engineering.

ME 591. Individual Study in Mechanical Engineering. 1-6 Hour.
Individual Study in Mechanical Engineering.

ME 611. Advanced Fluid Mechanics. 3 Hours.
Fundamental laws of motion for viscous fluid, classical solutions of the Navier-Stokes equations, inviscid flow solutions, laminar boundary layers, and stability criteria.

ME 613. Introduction to Computational Fluid Dynamics. 3 Hours.
Review of governing equations of fluid dynamics, mathematical behavior of partial differential equations, basic aspects of discretization, basic CFD techniques, basic grid generation, coordinate transformations, advanced numerical schemes, future CFD methodology. A knowledge of a computer language is required.

ME 614. Advanced Computational Fluid Dynamics. 3 Hours.
Finite Volume Scheme, Eigenvalues and Eigenvectors, Method of Characteristics, Upwind Schemes, Flux Vector Splitting, Flux Difference Splitting, Explicit and Implicit Schemes, Flux Jacobians, Newton Method, Boundary Conditions, Weak Solutions, TVD, PISO Methods.

ME 615. Introduction to Turbulent Flows. 3 Hours.
Characteristics of turbulence, length and time scales, energy cascade, vorticity stretching, Reynolds averaging technique, Closure problem, Boussinesq hypothesis, Eddy viscosity concepts, introduction to zero-, one-, and two-equation models, Reynolds stress model.

ME 631. Dynammics and Mobility of Vehicles: Modeling and Simulation. 3 Hours.
The main goal of the course is to present advanced research and engineering knowledge in recent vehicle dynamics of road and off-road wheeled and track vehicles with an emphasis on vehicle longitudinal/lateral mobility and energy efficiency. Applications include vehicles for personal transportation, military vehicles, construction equipment and farm tractors. A unique feature of this course is its inverse vehicle dynamics approach. Another distinctive feature of the course is a mechatronics-based approach to modeling and simulation of multi-domain systems that include mechanical, electrical and electronics components such as sensors and actuators. Coupled and interactive dynamics of vehicle systems is presented, and a modeling process of vehicle operational properties is based on various equations of analytical and adaptive dynamics. Students will gain knowledge and analytical hands-on skills through innovative homework and a research project. Skills in one of programming software/languages are required (e.g., MATLAB/Simulink, ADAMS/Car, LabVIEW, etc.).

ME 632. Autonomous Wheel Power Management Systems: Theory and Design. 3 Hours.
The main goal of this course is to give detailed understanding, analytical knowledge and engineering experience in research, design and experimental study of autonomous wheel power management systems (AWPMS). The AWPMS are autonomous mechatronic and autonomously operated mechanical systems that distribute power among the drive wheels of vehicles. AWPMS include various configurations of torque vectoring systems, limited slip differentials and hydraulically controlled differentials, electronically-locking differentials, and positive engagement of the wheels. AWPMS that are operationally integrated with steering and suspension systems are also presented in the course. Characteristics of wheel power management systems for a specific vehicle application are proved in the course by using inverse vehicle dynamics formulation and requirements to vehicle energy efficiency, mobility, stability of motion, and turnability. Students will learn mechanical design principles for mechatronic systems and methods for developing control algorithms. Methods for experimental study of wheel power management systems and vehicles are also presented in the course; including 4x4 vehicle chassis dynamometer with individual wheel control and test setups. Students will exercise analytical skills and gain hands-on experience through innovative homework and a research project.

ME 640. Heat Conduction. 3 Hours.
Introduction to methods of solution for heat conduction problems. Topics include separation of variables in rectangular, cylindrical and spherical coordinates, solution to the heat equation on semi-infinite and infinite domains, Duhamel's Theorem, use of Green's Function, and use of the Laplace Transform. A basic understanding of heat transfer at the undergraduate level is required for this course.

ME 641. Radiation Heat Transfer. 3 Hours.
Introduction to radiation heat transfer. Topics include radiation from black bodies and nonblack opaque surfaces, configuration factors for diffuse surfaces, radiation exchange in enclosures of diffuse-grey and specularly reflecting surfaces, radiation combined with conduction and convection, and energy transfer for absorbing, emitting and scattering media. A basic understanding of heat transfer at the undergraduate level is required for this course.

ME 650. Transport Phenomena. 3 Hours.
Laminar flow transports: momentum transfer (Couette/Poiseuille flows), energy transfer (free/forced convections and conductions), and mass transfer; equation of state, turbulence, chemical reactions, and numerical methods solving transport equations. Introduction to Fluid Mechanics and Introduction to Heat Transfer or equivalents are recommended prerequisites for this course.

ME 661. Math Methods in EGR I. 3 Hours.
Mathematical theory and solutions methods to problems in engineering including advanced ordinary differential equations; euigenvalue problems; multi-variable calculus and implicit functions; curve, surface ad volume representation and integration; Fourier integrals and transforms; separation of variables and transform techniques for solution of partial differential equations. Differential Equiations or equivalent is recommended as a prerequisite for this course.

ME 662. Math Methods in EGR II. 3 Hours.
Mathematical theory and solution methods to problems in engineering including Scalar and vector field theory advanced partial differential equations, analysis using complex variables, conformal mapping, complex integral calculus, Green's functions, perturbation methods, and variational calculus. Math Methods in EGR I or equivalent is recommended as a prerequisite for this course.

ME 663. Engineering Statistics. 2 Hours.
Introduction to applied statistics and probability for engineering and the physical sciences. Topics include introduction to probability, discrete and random variables and their distributions, joint probability distributions, hypothesis testing, statistical inference, linear regression and correlation, design of experiments, and statistical quality control. A basic understanding of calculus and matrix algebra at the undergraduate level is required for this course.

ME 665. Computational Methods in EGR. 3 Hours.
Applications of computers to solution of problems in engineering, including matrices, roots of equations, solution of simultaneous equations, curve fitting by least squares, differentiation and integration, differential and partial differential equations. Differential Equations and Computational Engineering or equivalents are recommended prerequisites for this course.

ME 670. Intro to Continuum Mechanics. 3 Hours.
Fundamentals and application of mechanics principles to problems in continuous media. Matrix and tensor mathematics, fundamentals of stress, kinematics and deformation of motion, conservation equations, constitutive equations and invariance, linear and nonlinear elasticity, classical fluids, linear viscoelasticity. Mechanics of Solids and Differential Equations or equivalents are recommended prerequisites for this course.

ME 672. Advanced Dynamics. 3 Hours.
Advanced topics in dynamics including complex motion analysis, generalized kinematic parameters, quasivelocities, and virtual displacements, direct and inverse dynamics approach, and fundamentals of systems with variable masses. Introduction to the modeling of mechatronic systems is presented through a consideration of mechanical,electrical and electronics components. Analytical and adaptive dynamics principles are taught as a basis for control algorithm development and mechatronic system design.

ME 675. Mechanics of Plates and Shells. 3 Hours.
Equations of motion from classical Kirchoff plate theory, with solutions for cylindrical bending, buckling, and natural vibration of plate strips, rectangular plates and circular plates. Navier, Levy and Rayleigh-Ritz solutions for rectangular plates under various boundary conditions. First and third order shear deformation plate theories with analytical and numerical solutions. Finite element models based on both classical and shear deformation plate theories.

ME 679. Advanced Finite Element Analysis. 3 Hours.
Concepts and applications of finite element method. Development and applications of various elements used in engineering mechanics. Use of finite element analysis software. Application of finite element concept and model development to fluid, heat transfer, and solid mechanics problems. Introduction to Fluid Mechanics, Introduction to Heat Transfer, and Mechanics of Solids or equivalents are recommended prerequisites for this course.

ME 688. Fluid-Structure Interactions. 3 Hours.
Modeling and simulation of fluid-structure interaction (FSI) phenomena using computational methods. The Arbitrary Lagrangian Eulerian (ALE) formulation, a variety of interpolation methods, mesh movement and time mapping algorithms. Solution of FSI problems using interface codes.

ME 690. Special Topics in (Area). 1-6 Hour.
Special Topics in (Area).

ME 691. Individual Study in (Area). 1-6 Hour.
Individual Study In (Area).

ME 698. Non-Thesis Research. 1-12 Hour.

ME 699. Thesis Research. 1-12 Hour.
Prerequisites: GAC M

ME 711. Advanced Fluid Mechanics. 3 Hours.
Fundamental laws of motion for viscous fluid, classical solutions of the Navier-Stokes equations, inviscid flow solutions, laminar boundary layers, and stability criteria.

ME 713. Introduction to Computational Fluid Dynamics. 3 Hours.
Review of governing equations of fluid dynamics, mathematical behavior of partial differential equations, basic aspects of discretrization, basic CFD techniques, basic grid generation, coordinate transformation, advanced numerical schemes, future CFD methodology. A knowledge of a computer language is required.

ME 714. Advanced Computational Fluid Dynamics. 3 Hours.
Finite Volume Scheme, Eigenvalues and Eigenvectors, Method of Characteristics, Upwind Schemes, Flux Vector Splitting, Flux Difference Splitting, Explicit and Implicit Schemes, Flux Jacobians. Newton Method, Boundary Conditions, Weak Solutions, TVD, PISD Methods.

ME 715. Introduction to Turbulent Flows. 3 Hours.
Characteristics of turbulence, length and time scales, energy cascade, vorticity stretching, Reynolds averaging techniques. Closure problem, Boussinesq hypothesis, Eddy viscosity concepts, introduction to zero-, one-and two-equation models, Reynolds stress model.

ME 731. Dynamics and Mobility in Vehicles: Modeling and Simulation. 3 Hours.
The main goal of the course is to present advanced research and engineering knowledge in recent vehicle dynamics of road and off-road wheeled and track vehicles with an emphasis on vehicle longitudinal/lateral mobility and energy efficiency. Applications include vehicles for personal transportation, military vehicles, construction equipment and farm tractors. A unique feature of this course is its inverse vehicle dynamics approach. Another distinctive feature of the course is a mechatronics-based approach to modeling and simulation of multi-domain systems that include mechanical, electrical and electronics components such as sensors and actuators. Coupled and interactive dynamics of vehicle systems is presented, and a modeling process of vehicle operational properties is based on various equations of analytical and adaptive dynamics. Students will gain knowledge and analytical hands-on skills through innovative homework and a research project. Skills in one of programming software/languages are required (e.g., MATLAB/Simulink, ADAMS/Car, LabVIEW, etc.).

ME 732. Autonomous Wheel Power Management Systems: Theory and Design. 3 Hours.
The main goal of this course is to give detailed understanding, analytical knowledge and engineering experience in research, design and experimental study of autonomous wheel power management systems (AWPMS). The AWPMS are autonomous mechatronic and autonomously operated mechanical systems that distribute power among the drive wheels of vehicles. AWPMS include various configurations of torque vectoring systems, limited slip differentials and hydraulically controlled differentials, electronically-locking differentials, and positive engagement of the wheels. AWPMS that are operationally integrated with steering and suspension systems are also presented in the course. Characteristics of wheel power management systems for a specific vehicle application are proved in the course by using inverse vehicle dynamics formulation and requirements to vehicle energy efficiency, mobility, stability of motion, and turnability. Students will learn mechanical design principles for mechatronic systems and methods for developing control algorithms. Methods for experimental study of wheel power management systems and vehicles are also presented in the course; including 4x4 vehicle chassis dynamometer with individual wheel control and test setups. Students will exercise analytical skills and gain hands-on experience through innovative homework and a research project.

ME 740. Heat Conduction. 3 Hours.
Introduction to methods of solution for heat conduction problems. Topics include separation of variables in rectangular, cylindrical and spherical coordinates, solution to the heat equation on semi-infinite and infinite domains, Duhamel's Theorem, use of Green's Function, and use of the Laplace Transform. A basic understanding of heat transfer at the undergraduate level is required for this course.

ME 741. Radiation Heat Transfer. 3 Hours.
Introduction to radiation heat transfer. Topics include radiation from black bodies and nonblack opaque surfaces, configuration factors for diffuse surfaces, radiation exchange in enclosures of diffuse-grey and specularly reflecting surfaces, radiation combined with conduction and convection, and energy transfer for absorbing, emitting and scattering media. A basic understanding of heat transfer at the undergraduate level is required for this course.

ME 750. Transport Phenomena. 3 Hours.
Laminar flow transports: momentum transfer (Couette/Poiseuille flows), energy transfer (free/forced convections and conductions), and mass transfer; equation of state, turbulence, chemical reactions, and numerical methods solving transport equations.

ME 761. Math Methods in EGR I. 3 Hours.
Mathematical theory and solutions methods to problems in engineering including advanced ordinary differential equations; euigenvalue problems; multi-variable calculus and implicit functions; curve, surface ad volume representation and integration; Fourier integrals and transforms; separation of variables and trsnform techniques for solution of partial differential equations. Differential Equiations or equivalent is recommended as a prerequisite for this course.

ME 762. Math Methods in EGR II. 3 Hours.
Mathematical theory and solution methods to problems in engineering including Scalar and vector field theory advanced partial differential equations, analysis using complex variables, conformal mapping, complex integral calculus, Green's functions, perturbation methods, and variational calculus. Math Methods in EGR I or equivalent is a recommended prerequistie for this course.

ME 763. Engineering Statistics. 3 Hours.
Introduction to applied statistics and probability for engineering and the physical sciences. Topics include introduction to probability, discrete and random variables and their distributions, joint probability distributions, hypothesis testing, statistical inference, linear regression and correlation, design of experiments, and statistical quality control. A basic understanding of calculus and matrix algebra at the undergraduate level is required for this course.

ME 765. Computational Methods in EGR. 3 Hours.
Applications of computers to solution of problems in engineering, including matrices, roots of equations, solution of simultaneous equations, curve fitting by least squares, differentiation and integration, differential and partial differential equations. Differential Equations and Computational Engineering or equivalents are recommended prerequisites for this course.

ME 770. Intro to Continuum Mechanics. 3 Hours.
Fundamentals and application of mechanics principles to problems in continuous media. Matrix and tensor mathematics, fundamentals of stress, kinematics and deformation of motion, conservation equations, constitutive equations and invariance, linear and nonlinear elasticity, classical fluids, linear viscoelasticity. Mechanics of Solids and Differential Equations or equivalents are recommended prerequisites for this course.

ME 772. Advanced Dynamics. 3 Hours.
Advanced topics in dynamics including complex motion analysis, generalized kinematic parameters, quasivelocities and virtual displacements, direct and inverse dynamics approaches, and fundamentals of systems with variable masses. Introduction to the modeling of mechatronic systems is presented through a consideration of mechanical, electrical, and electronics components. Analytical and adaptive dynamics principles are taught as a basis for control algorithm development and mechatronic system design. Students are expected to have a working knowledge of dynamics prior to registering for this course.

ME 775. Mechanics of Plates and Shells. 3 Hours.
Equations of motion from classical Kirchoff plate theory, with solutions for cylindrical bending, buckling, and natural vibration of plate strips, rectangular plates and circular plates. Navier, Levy and Rayleigh-Ritz solutions for rectangular plates under various boundary conditions. First and third order shear deformation plate theories with analytical and numerical solutions. Finite element models based on both classical and shear deformation plate theories.

ME 779. Advanced Finite Element Analysis. 3 Hours.
Concepts and applications of finite element method. Development and applications of various elements used in engineering mechanics. Use of finite element analysis software. Application of finite element concept and model development to fluid, heat transfer, and solid mechanics problems. Introduction to Fluid Mechanics, Introduction to Heat Transfer, and Mechanics of Solids or equivalents are recommended prerequisites for this course.

ME 788. Fluid-Structure Interactions. 3 Hours.
Modeling and simulation of fluid-structure interaction (FSI) phenomena using computational methods. The Arbitrary Lagrangian Eulerian (ALE) formulation, a variety of interpolation methods, mesh movement and time mapping algorithms. Solution of FSI problems using interface codes.

ME 790. Special Topics in ME. 1-6 Hour.
Special Topics in (Area).

ME 791. Individual Study in (Area). 1-6 Hour.
Individual Study in (Area).

ME 796. IEGR Journal Club. 1 Hour.
Journal club to discuss current research and investigations in areas of interdisciplinary engineering.

ME 798. Non-Dissertation Research. 1-12 Hour.
Research.

ME 799. Dissertation Research. 1-12 Hour.
Research.
Prerequisites: GAC Z

School of Health Professions

Dean: Andrew J. Butler, PhD

Associate Dean for Academic & Faculty Affairs: Melanie Hart, PhD,

Associate Dean for Research and Innovation: Ritu Aneja, PhD,

Assistant Dean for Clinical Affairs: Anthony Patterson, MSHA

The School of Health Professions delivers educational programs to prepare health personnel who will improve the services in health care and the systems through which these services are provided. In keeping with the mission of the University of Alabama at Birmingham, the resources and programs of the school are dedicated to excellence in teaching, research, and scholarly activity and to service to the institution, the community, and the professions represented by programs of the school.

Degree options in the School of Health Professions include bachelor's, master's, and doctoral programs sponsored by five academic departments – Clinical and Diagnostic Sciences, Health Services Administration, Nutrition Sciences, Occupational Therapy, and Physical Therapy. In addition, certificate options are available in some specialized areas. The School sponsors more than 30 degree and certificate options, all of which require students to apply for and be accepted to the specific degree or certificate program.

The School of Health Professions is committed to the practice of ethical standards of conduct. School policies, procedures, and regulations reflect this commitment and are in compliance with those of the University of Alabama at Birmingham. To ensure continued practice of ethical standards, the administration and the standing committees of the school (Faculty Affairs, Academic Affairs, Student Affairs, and Diversity, Equity, and Inclusion) regularly review school policies and procedures. All research endeavors are in compliance with policies of the UAB Institutional Review Board.

SHP Mission, Vision, Values

The mission of the School of Health Professions is "*To improve health care through teaching, research, and translation of discoveries into practice in partnership with the UAB community."* The School vision is, "*To be recognized as the leading school of health professions – shaping the future of healthcare*." Fulfilling the mission requires faculty and staff to embrace the following organizational values:

- Accountability
- Collaboration/Cooperation
- Diversity
- Excellence
- Innovation/Creativity
- Integrity/Ethical behavior
- Open communication
- Professional behavior

SHP Admissions

Entrance requirements for the individual educational programs of SHP vary. Persons desiring admission to a particular program should consult the appropriate section of the University Catalogs for specific entrance requirements, application process, and program information. Students who attend an institution other than UAB are encouraged to seek academic advisement from the intended program as early as possible to plan for completion of program prerequisites.

The School of Health Professions welcomes applications from all individuals who are prepared for the programs offered. All applicants must offer acceptable evidence of ability and intent to meet the academic standards specified by the particular program into which admission is desired. In addition, certain immunizations are required prior to enrollment. For specific requirements, see the UAB Student Health and Insurance Programs and UAB Immunization Policy. If accepted into a SHP program, students must complete a background check and drug screen upon admission and again prior to clinical placement. Applicants are considered regardless of race, color, religion, sex, sexual orientation, national origin, disability unrelated to program performance, disabled veteran status, or Vietnam era veteran status (see UAB Equal Opportunity Policy). Persons who have not yet decided upon a specific health career may obtain information from the:

SHP Office of Student Services and Advising
School of Health Professions Building
1716 9th Avenue South / Room 230
Telephone: (205) 934-4195

Courses

HRP 525. Preparation for Professional School in Health Professions. 1 Hour.
Prepare students to apply for health professional graduate programs through seminars on interview skills, personal statements, and essential professional skills.

HRP 526. Preparation for Professional School and Exam Preparation in Health Professions. 4 Hours.
Prepare students to apply for health professional graduate programs through seminars on interview skills, test prep, personal statements, and essential professional skills.

HRP 575. Introduction to Healthcare Simulation for Quality and Safety. 1-2 Hour.
Introduction to the use of simulation-based training and systems for improving patient safety and quality, including exploration of immersive, procedural, and in situ modalities. Instructional methodologies include didactics, technology-enhanced simulations, and team-based assignments in the simulation environment.

HRP 705. Teaching in Health Professions. 3 Hours.
Study of educationally sound curricular design, instructional delivery options and active learning, and methods and types of assessment for teaching in health professions.

Interdisciplinary Programs

The School of Health Professions offers two graduate level interdisciplinary programs. The Graduate Certificate in Health-Focused Patient/Client Management for Physical and Occupational Therapists (p. 391) is designed to prepare PTs and OTs for expanding roles in the areas of prevention, health promotion, and wellness. Health Focused Patient/Client Management is the integration of health promotion and education methods in OT and PT practice to create a holistic approach to enhance patient/client wellness and quality of life. ***Admissions to this certificate are currently suspended.***

The Ph.D. in Rehabilitation Science (p. 392) is an interdisciplinary program sponsored by the Department of Occupational Therapy and the Department of Physical Therapy within the School of Health Professions.

This program is designed to prepare graduates to become academicians, scholars, scientists, and researchers in education, health care, industry, and government institutions as well as consultants to individuals, communities, and governments. The aim of this program is to prepare candidates to become leaders in teaching and research within the field of Rehabilitation Science. However, this is not a clinical training program. Applicants planning to become occupational therapists or physical therapists should look at the graduate catalog entries for these two professions.

Health Focused Patient/Client Management for Physical and Occupational Therapists

Contact Information

Program Director:	Jennifer B Christy, PT, PhD
E-Mail:	jbraswel@uab.edu
Phone:	205 - 934 - 3566

Mailing address:

The University of Alabama at Birmingham
Department of Physical Therapy
1716 9th Avenue South
SHPB 346
Birmingham, AL 35294-1212

Program Information

The UAB Graduate Certificate in Health Focused Patient/Client Management for Physical and Occupational Therapists is designed to prepare PTs and OTs for expanding roles in the areas of prevention, health promotion, and wellness. Health Focused Patient/Client Management is the integration of health promotion and education methods in OT and PT practice to create a holistic approach to enhance patient/client wellness and quality of life. The ultimate goal of the certificate is to enable graduates to develop and implement clinical and community programs to address lifestyle and behavior factors that underlie many chronic diseases. Emphasis will be placed on program development for persons with disabilities. The concepts addressed in the certificate program are applicable across the patient/client lifespan and in a variety of practice settings.

Requirements		Hours
PTC 780	Hlth Focused Care in PT & OT	3
PTC 781	Health Focused Patient/Client Communication and Advocacy	3
PTC 782	Health Focused Patient/Client Management I	3
PTC 783	Health Focused Patient/Client Management II	3
PTC 784	Health Focused Care - Synthesis Project	3

Credentials Conferred

The Graduate Certificate in Health Focused Patient/Client Management for Physical and Occupational Therapists is awarded by the University of Alabama at Birmingham.

Length of Study

The certificate requires 5 semesters to complete; students take 1 course per semester.

Program Entrance Date

Students may begin the program in the spring, summer or fall term.

Admission Requirements

Admissions requirements include completion of a degree in physical or occupational therapy and current licensure as a physical or occupational therapist in the United States or foreign equivalent. Students from countries where English is not the official and primary language must also take and receive an acceptable score on the TOEFL or IELTS. ***Admission to the certificate is currently suspended.***

Degree Requirements

15 credit hours (5 required courses)

Courses

PTC 780. Hlth Focused Care in PT & OT. 3 Hours.
Overview of health promotion principles and health behavior theories as applied in contemporary health care, especially in rehabilitation services. Evidence is presented for the most prevalent preventable chronic diseases/conditions and the health behaviors that contribute to these conditions.

PTC 781. Health Focused Patient/Client Communication and Advocacy. 3 Hours.
Communication and advocacy strategies to effect behavior change at the individual and community level; application of evidence-based and best practice methods/techniques that empower individuals and community to change health-related behaviors.

PTC 782. Health Focused Patient/Client Management I. 3 Hours.
Application of evidence-based and best practice methods/techniques for physical activity/fitness, weight management, and nutrition optimization using a health focused care model.

PTC 783. Health Focused Patient/Client Management II. 3 Hours.
Examines how occupational and physical therapists address smoking cessation, alcohol moderation, sleep health, and stress management using a health focused care model for individuals and community groups. Issues addressed include screening, best practices for interventions, patient education resources, and consultation/referral sources to optimize health outcomes.

PTC 784. Health Focused Care - Synthesis Project. 3 Hours.
Synthesis of content from previous certificate courses to develop a health focused program in the clinical or community setting.

PTC 790. Challenges in American Healthcare: Physical Therapy as a Part of the Solution. 2 Hours.
Exploration of current trends in health and healthcare in the United States with emphasis placed on underserved populations and marginalized communities. As a member of a primary care team, students will assess, analyze, synthesize, and modify determinants of health that underlie health disparities with respect to individual and community health outcomes.

PTC 791. Physical Therapist Role in Primary Care. 2 Hours.
Explore current primary care practice models in which a physical therapist is a team member.

PTC 792. Health-Focused Physical Therapy Care I. 2 Hours.
Preparation to assist patients/clients in underserved populations and marginalized communities to adopt healthier lifestyles, achieving better physical therapy outcomes, and optimize their health using the Health-Focused Physical Therapy Model. This course is part one of a two-course series.

PTC 793. Advanced Physical Therapy Management of Priority Health Conditions I. 2 Hours.
Individual management of identified priority health conditions, within the context of primary care. This course is part one of a two course series where students will use the Patient/Client Management model to develop advanced screening/examination, evaluation, diagnostic and prognostic skills, and plan of care applied to complex and often chronic conditions in a primary care environment.

PTC 794. Health Focused Physical Therapy II. 2 Hours.
Prepares students to assist their patients/clients in underserved populations and marginalized communities to adopt healthier lifestyles, achieving better physical therapy outcomes, and optimizing their health using the Health-Focused Physical Therapy Model. This course is part two of a two-course series addressing health focused care in physical therapy.

PTC 795. Advanced Physical Therapy Management of Priority Health Conditions II. 2 Hours.
Individual management of priority health conditions, within the context of primary care. This course is part two of a two-course series where students will develop advanced intervention skills applied to complex and often chronic conditions in a primary care environment.

PTC 796. Physical Therapists' Role in Disaster Emergency Preparation and Management. 1 Hour.
Underserved populations and marginalized communities are particularly vulnerable in natural disaster events and emergency situations. This course provides the physical therapist with skills within their scope of practice to prepare and respond to emergencies and disasters. Completion of National Safety Council Emergency Medical Response Training is required prior to course enrollment.

PTC 797. Community Engagement and Program Planning for Physical Therapists. 2 Hours.
Strategies for and benefits of community engagement and advocacy by physical therapists. Emphasis placed on needs assessment techniques, program planning, implementation, and evaluation.

Rehabilitation Science

Degree Offered:	Ph.D.
Director:	Dr. William Reed
Phone:	(205) 934-3261
E-mail:	wreed@uab.edu or rehabscience@uab.edu
Website:	http://www.uab.edu/rsphd

Program Information

Ph.D. in Rehabilitation Science

The Ph.D. in Rehabilitation Science program is an interdisciplinary program offered by The Department of Occupational Therapy and The Department of Physical Therapy at the School of Health Professions. This exciting program is designed to prepare graduates to become*:

- Academicians, scholars, scientists and researchers in education, health care, industry, and government institutions.
- Consultants to individuals, communities, and governments.

The goal of the Program is to prepare graduates to have the following skills:

- Design and implement research studies that will contribute to the knowledge base of rehabilitation science.
- Design and deliver educational courses related to rehabilitation.
- Translate innovative rehabilitation research findings into practice so as to advance the field of rehabilitation science.

* The aim of this program is to prepare candidates to become leaders in teaching and research within the field of Rehabilitation Science. However, this is not a clinical training program. Applicants planning to become occupational therapists or physical therapists should visit the following websites to pursue training in these two professions: www.uab.edu/ot or www.uab.edu/pt.

Application Procedure

Received by UAB Graduate School

LHL G03
1720 2nd Avenue South
Birmingham, Alabama 35294-0013

- Complete and submit online Graduate School application (uab.edu/graduate)
- Submit application fee payment - Domestic: $50.00
- Request one (1) official transcript to be mailed by the issuing institution to the UAB Graduate School
- Three (3) letters of recommendation are required. Please ask the individuals from whom you requested references to submit them online via the recommendation email request they receive. Electronic submission is the preferred method. However, if your referees prefer to mail a recommendation letter, it should be mailed to the address of the department or program to which you are applying.

Minimum Requirements for Admission

- Note that each application will be reviewed by the Admission Committee to identify individuals with strong commitment and aptitude to perform research related to Rehabilitation Science, along with strong academic preparation and professional-leadership potential.
- Undergraduate or graduate degree in occupational or physical therapy, engineering, exercise science, neuroscience, medicine, nursing, or other health related professions.
- Recommended minimum GPA 3.0/4.0 in all previous coursework
- Three strong evaluation references, with at least one from a research lab mentor, and one from an academic source.
- With the written essay, provide evidence of appropriate goals of study, professional growth and commitment to research, with special emphasis on interest in research that is being conducted at UAB.
- Interview with faculty that shows passion and commitment to research and professional growth in Rehabilitation Science.

For further information contact:

Elisa Lewis, Program Coordinator II

PhD Program in Rehabilitation Science

205-934-4644
email: elewis06@uab.edu

Typical Program

(Course requirements are listed in semester credit hours)

First Year

First Term	Hours	Second Term	Hours	Summer Term	Hours
RHB 780	3	RHB 781	3	RHB 782	3
RHB 783	3	RHB 785	3	RHB 789	1
RHB 789	1	RHB 789	1	GRD 717	3
EPR 609	3	RHB 795	3	EPR 710	3
				Qualifer Exam	
	10		**10**		**10**

Second Year

First Term	Hours	Second Term	Hours	Summer Term	Hours
RHB 789	1	RHB 789	1	RHB 746	1
RHB 798	3	RHB 798	3	RHB 789	1
HRP 705	3	RHB 770	3	RHB 798	3
Elective Coursework	3	Elective Coursework	3	Elective Coursework	5
				Dissertation Proposal	
	10		**10**		**10**

Third Year

First Term	Hours	Second Term	Hours	Summer Term	Hours
RHB 799	6-9	RHB 799	6-9	RHB 799	6-9
	6-9		**6-9**		**6-9**

Fourth Year

First Term	Hours	Second Term	Hours
RHB 799	6-9	RHB 799	6-9
		Dissertation Defense	
	6-9		**6-9**

Total credit hours: 90-105

*The degree plan will vary by the student's academic discipline and preparation upon entry to the PhD in Rehabilitation Science Program.

A Sample of possible Elective Courses Currently Offered at UAB includes:

Requirements		Hours
Concentration Electives: These are electives in a specific disease, population, or content area of interest		
RHB 590	Quantitative Biomechanics of Injury and Rehabilitation	
NCH 760	Child Health Theories and Concepts	
RHB 704	Analysis of Human Movement for Rehabilitation Science	
RHB 706	Neuroscience I for Rehabilitation Science	
RHB 707	Neuroscience II for Rehabilitation Science	
RHB 720	Pathology and Pharmacology for Movement Disorders I for Rehabilitation Science	
RHB 721	Pathology and Pharmacology for Movement Disorders II for Rehabilitation Science	
RHB 730	Essentials of Human Physiology for Rehabilitation Science	
RHB 731	Human Performance Physiology for Rehabilitation Science	
NTR 650	Body Composition and Energy Metabolism	
OT 677	Foundations in Low Vision Rehabilitation I	
Academic Writing Electives: These are electives that focus on developing writing skills for scientific publications and/or preparation		
GRD 708	Writing Successfully	
GRD 729	Writing Your Journal Article in 12 Weeks	
Research Methods Electives: These are electives in a specific research methodlogy or study design areas of interest		
HPO 787	Empirical Methods for Health Research	
HPO 692	Health Equity and Inclusion in Public Health Programs and Policies	
NRM 773	Qualitative Research Methods	
Statistical Methodology Electives: These are electives in a specific statistical or data analysis methodolgy		
HPO 721	Clinical Decision Making and Cost Effectiveness Analysis	
EPI 710	Analysis of Case Control Studies	
CS 610	Database Systems	
BST 623	General Linear Models	
BST 665	Survival Analysis	
EPR 792	Mixed Methods Approaches to Educational Research	

Courses

RHB 500. Introduction to Rehabilitation Science. 3 Hours.
Encapsulating science from the level of the cell and body structure to the person, family, community and society level, rehabilitation science serves as a foundation and the body of knowledge by which individuals may develop and evaluate current and emerging approaches to enhancing enablement and minimizing disability.

RHB 575. Special Topics in Rehabilitation Science. 1-4 Hour.
Exploration of current topics in Rehabilitation Sciences.

RHB 590. Quantitative Biomechanics of Injury and Rehabilitation. 3 Hours.
Material, mechanical, electrophysiological and energetic principles of human movement. Comparison of non-impaired verses impaired systems in relation to injury/disability.

RHB 704. Analysis of Human Movement for Rehabilitation Science. 3 Hours.
Study of human movement through an examination of the movement patterns during common motor skills (e.g., walking). The kinematics and kinetics related to movement across the lifespan.
Prerequisites: RHB 780 [Min Grade: C]

RHB 706. Neuroscience I for Rehabilitation Science. 3 Hours.
Study of the structure and function of the human nervous system with emphasis on sensory/motor function in Rehabilitation Science.
Prerequisites: RHB 780 [Min Grade: C]

RHB 707. Neuroscience II for Rehabilitation Science. 3 Hours.
Study of the theories of motor control and motor learning will serve as a foundation for the understanding of how the central nervous system is organized in relation to human movement. Assists students in integrating knowledge with human anatomy, physiology, and biomechanics in relation to the production of human movement.
Prerequisites: RHB 780 [Min Grade: C]

RHB 720. Pathology and Pharmacology for Movement Disorders I for Rehabilitation Science. 3 Hours.
Overview of clinical medicine related to management of movement disorders. Basic principles of pathology and pharmacology. Exploration of physical therapy/rehabilitation implications associated with medical and surgical management of disorders with emphasis on clinical manifestations, management, and physical therapy/rehabilitation implications.
Prerequisites: RHB 780 [Min Grade: C]

RHB 721. Pathology and Pharmacology for Movement Disorders II for Rehabilitation Science. 3 Hours.
Exploration of medical and surgical disorders with emphasis on clinical manifestations, management, and rehabilitation implications.
Prerequisites: RHB 780 [Min Grade: C] and RHB 720 [Min Grade: C]

RHB 730. Essentials of Human Physiology for Rehabilitation Science. 3 Hours.
Fundamental principles and concepts of human physiology are covered regarding cell physiology, the cardiovascular, endocrine, gastrointestinal, pulmonary, renal, and skeletal muscle systems. Both cellular and systemic issues are addressed with an emphasis on a mechanistic and integrative approach to understanding function.
Prerequisites: RHB 780 [Min Grade: C]

RHB 731. Human Performance Physiology for Rehabilitation Science. 3 Hours.
Course provides fundamental knowledge about the adaptability of human physiological systems in meeting a range of exercise demands. Areas covered include energy transfer during rest and exercise, physiologic and performance adaptations, exercise prescription for healthy adults, and body composition. Research evidence regarding how exercise and physical activity impact health, wellness, and disease is included as related to rehabilitation science.
Prerequisites: RHB 780 [Min Grade: C]

RHB 740. Teaching Practicum. 1-3 Hour.
Individually designed, directed teaching experience in focus area appropriate to student's background, needs, and goals under guidance of faculty preceptor.
Prerequisites: RHB 780 [Min Grade: C] and RHB 781 [Min Grade: C] and RHB 782 [Min Grade: C] and RHB 783 [Min Grade: C] and RHB 784 [Min Grade: C]

RHB 746. Rehabilitation Science Journal Club. 1 Hour.
Student-led, facilitated discussion of current, impactful published research in rehabilitation science. Interaction with scientists and clinicians from multiple disciplines contributing to the rehabilitation science.

RHB 770. Systematic Review Protocol Development. 3 Hours.
Provides knowledge of formalized methods to plan and execute a systematic review on a topic of choice.

RHB 775. Special Topics in Rehabilitation Sciences. 1-4 Hour.
Exploration of current issues in Rehabilitation Sciences.

RHB 780. Principles of Rehabilitation Science: Movement Science. 3 Hours.
Interdisciplinary discussion of concepts, theories, principles, and research literature underlying the understanding of neural control, biomechanics, motor learning, and motor development and how purposeful and functional body movements are accomplished under a variety of health conditions and disease processes.

RHB 781. Principles of Rehabilitation Science: Exercise Science. 3 Hours.
Interdisciplinary discussion of concepts, theories, principles, and research literature underlying the understanding of cardiac and pulmonary physiology, exercise physiology, and health behaviors and how important activities are accomplished under a variety of health conditions and disease processes.

RHB 782. Principles of Rehabilitation Science: Occupation Science. 3 Hours.
Interdisciplinary discussion of concepts, theories, principles, and research literature underlying the understanding of occupation science and how work and play activities are accomplished under a variety of health conditions and disease processes.

RHB 783. Research Design/Measurement in Rehab Sci. 3 Hours.
A detailed overview of research design and methodologies used in rehabilitation science, including quantitative and qualitative methods.

RHB 784. Res Design/Measure Rehab Sc II. 3 Hours.
A detailed overview of research design and methodologies used in rehabilitation science, including quantitative and qualitative methods. A continuation of Research Design and Measurement in Rehabilitation Science I.

RHB 785. Principles of Behavior Change in Rehabilitation Science. 3 Hours.
Scientific and theoretical principles underlying health behavior change in the context of rehabilitation science; health behavior from an ecological perspective; seminal behavior change theories; key elements required for design, implementation, and analysis of rigorous health behavior change research.

RHB 789. Rehab Science Seminar. 1-2 Hour.
Varied discussion of rehabilitation science topics to help students explore research questions in preparation for their dissertation.

RHB 795. Rehabilitation Science Research Proposal. 3 Hours.
Instruction and support for writing a Rehabilitation Science research proposal. Topics to be covered include but are not limited to: developing the Specific Aims, Abstract, Narrative, Significance, Innovation, and Research Strategy sections; creating figures and tables; planning and writing the training and career development sections; developing the biosketch; understanding other grant sections and the scientific review process.
Prerequisites: RHB 780 [Min Grade: C]

RHB 798. Non Dissertation Research. 1-9 Hour.
Development of research proposal.

RHB 799. Dissertation Research. 1-9 Hour.
Dissertation Research.
Prerequisites: GAC Z

Clinical and Diagnostic Sciences

The Department of Clinical and Diagnostic Sciences is comprised of academic programs essential to today’s healthcare system. Our programs provide training for future health care professionals in a variety of disciplines ranging from the diagnosis of illness and disease, the administration of advanced treatment therapies, to the performance of vital roles in surgical suites and in outpatient and inpatient healthcare settings. Graduates of our programs are well poised for a wide variety of job opportunities due to the outstanding education received at UAB. Current graduate program offerings include:

- **Biomedical and Health Sciences, M.S.**
- **Biotechnology, M.S., PhD, and Biotechnology Regulatory Affairs Graduate Certificate**
- **Medical Laboratory Science, M.S.**
- **Genetic Counseling, M.S.**
- **Health Physics, M.S.**
- **Industry Genetics and Genomics Graduate Certificate**
- **Nuclear Medicine and Molecular Imaging Sciences, M.S.**
- **Physician Assistant Studies, M.S.P.A.S.**

Biotechnology Regulatory Affairs Graduate Certificate

Degree Offered:	Graduate Certificate in Biotechnology Regulatory Affairs
Program Coordinator:	Kimberly McCall, Ph.D.
Phone:	(205) 934-3209
E-Mail:	ASKCDS@uab.edu
Website:	https://www.uab.edu/shp/cds/biotechnology-regulatory-affairs

Program Information

Program Mission

As the biotechnology industry grows and life science companies mature, there is an increasing demand for a workforce trained in regulatory affairs to ensure that therapeutics, biologics, diagnostics and medical device products progress successfully through the development, manufacturing and marketing processes. Currently, there are thousands of ongoing clinical trials of new drugs, with many of them soon to be approved and ready for full-scale production, resulting in an all-time high demand for individuals with regulatory training.

The Biotechnology Regulatory Affairs certificate program is designed to provide students with targeted training and education in:

- The philosophies and roles of the domestic and international regulatory agencies that oversee drug, biologic, device, and diagnostics development,
- The laws that govern the development, manufacturing and commercial distribution of drugs, biologics and medical devices,
- The analysis of how emerging developments and trends are reshaping drug development and medical device regulation,
- The biological processes and laboratory techniques utilized for the discovery, development and evaluation of therapeutic drugs,
- Major concepts under which clinical trials are designed and run,
- The roles of the U.S. Food and Drug Administration (FDA), Institutional Review Boards, the Code of Federal Regulations and ethical principles,
- The complexities of clinical trial initiation and the issues of site and data management.

Essential Requirements

Fundamental tasks, behaviors, and abilities necessary to successfully complete the requirements of the Program are available upon request from the Biotechnology program office. If you have a disability, but have not contacted Disability Support Services (DSS), please call 934-4205 or visit http://www.uab.edu/students/disability/.

Entry Term	Deadline
Entry Term:	Fall Semester
Deadline for All Application Materials to be in the Graduate School Office:	February 28 (Early Acceptance); August 1 (Final Acceptance)
Entrance Tests:	For international applicants from non-English speaking countries, scores for the Test of English as a Foreign Language (TOEFL) and the Test of Written English (TWE)
Comments:	Financial aid (fellowship, stipend, or assistantship) is not available from the program; transcript evaluation by WES is required for applicants with foreign university degrees

Biotechnology Regulatory Affairs Graduate Certificate Curriculum Requirements

Requirements		Hours
BTR 605	Biotechnology Regulatory & Quality Systems	3
BTR 615	Applications of Biological Processes in Drug Development	3
BTR 620	Regulation of Food and Drugs	3
BTR 640	Clinical Development of Drugs, Biologics, Diagnostics, and Medical Devices	3
BTR 690	Clinical Trial Implementation	3
Total Hours		**15**

Contact Information

For detailed information, contact the Department of Clinical and Diagnostic Sciences, Biotechnology Program, UAB School of Health Professions, SHPB 430, 1716 9th Avenue South, Birmingham, Alabama 35294-1212

Telephone (205) 934-3209

E-mail ASKCDS@uab.edu

Website https://www.uab.edu/shp/cds/graduate

Industry Genomics and Genetics Graduate Certificate

Degree Offered:	Graduate Certificate in industry Genetics and Genomics
Program Coordinator:	Alicia Gomes, MS, LCGC
Phone:	205-934-7299
Email:	ASKCDS@uab.edu
Website:	https:\\www.uab.edu\shp\cds\industry-genetics-and-genomics-certificate

Program Information

The Industry Genetics and Genomics Graduate Certificate is designed to provide advanced skills and education that will prepare graduates for employment in genomic industries that focus on variant data and its interpretation. Advances in the application of genetics and genomics technology in clinical care to support the paradigm shift to personalized medicine has created a need for health care providers and genomics industry professionals to integrate genetics and genomic data with medicine. The certificate is intended to meet the educational needs for the current workforce in medical genetics and clinical laboratories for advanced analytical interpretation and applications related to genomics related topics.

The Industry Genetics and Genomics Certificate is designed to enable students to meet the following learning objectives upon completion of the certificate:

• Integration of advanced knowledge in the clinical applications of genetics and genomic technology to support the workforce demand in the genetics and genomics laboratory industry,

• Effectively utilize of genetics and genomics data in clinical care,

• Assess genomics technologies and determine appropriate use in the clinical genomics industry,

• Effectively integrate genomic and clinical knowledge with the legal, regulatory, marketing, and financial aspects of the clinical genomics industry,

• Effectively apply professional guidelines for genetic variant classification for clinical applications,

• Communicate effectively with clinical genomics laboratory personnel and work in teams within the clinical genomics laboratory, serve as a resource to clinicians to improve the utilization of genomics technology in clinical care, and

• Apply genomic industry standards within a clinical laboratory setting through direct application.

Essential Functions

The essential functions below extend beyond academic requirements for admission and are standards that all enrolled students must possess in order to successfully complete the graduate certificate.

- Communicate effectively and sensitively with members of the health care team.
- Possess the mental capacity for critical thinking including the ability to assimilate, analyze, synthesize, and integrate concepts and to problem solve in a timely fashion.
- Adapt to changing environments and function effectively under stress.

Admission Requirements

- Baccalaureate degree from a regionally accredited institution.
- Applicants must meet all requirements of the UAB Graduate School.
- A minimum overall GPA of 3.0 from prior coursework or degree program.
- Pre-requisite coursework: an undergraduate course in genetics

Requirement	Fulfilled By:
Entry Term:	Summer Semester
Application Deadline:	March 1
Entrance Tests:	For international applicants from non-English speaking countries, scores for the Test of English as a Foreign Language (TOEFL) and the Test of Written English (TWE)

Industry Genetics and Genomics Graduate Certificate Curriculum Requirements

Graduate Certificate in Industry Genetics & Genomics

Requirements		Hours
IGC 620	Applied Advanced Medical Genetics and Genomics	3
or IGC 624	Genetics and Genomics Diagnostics Regulation	
IGC 621	Clinical Genomic Testing Technologies and Methodologies	3
IGC 622	Clinical Tools for Genomic Variant Curration and Analysis	3
IGC 623	Genomic Variant Interpretation Using Clinical Application	3
IGC 625	Implementation of Variant Interpretation Practices in the Genetics and Genomics Industry	3
Total Hours		**15**

Contact Information

For detailed information, contact the Program Coordinator, Industry Genetics and Genomics Graduate Certificate, UAB, School of Health Professions, 1716 9th Avenue South, SHPB 444, Birmingham, AL 35294-1212

Telephone 205-975-4CDS (205-975-4237)

E-mail: AskCDS@uab.edu

Website: www.uab.edu/shp/cds/industry-genetics-and-genomics-certificate

Courses

CDS 505. Professional Skills Development. 1 Hour.
Development of professional behaviors and attitudes required for success in healthcare.

CDS 560. Foodborne and Waterborne Outbreak Investigations. 3 Hours.
Analysis of different aspects (basic microbiology, epidemiological analysis, surveillance tools, regulations, environmental and laboratory testing) of foodborne and waterborne outbreak investigations.

CDS 605. Survival Spanish for Health Professionals. 1 Hour.
Health care professionals will be introduced to basic vocabulary, useful questions and expressions in Spanish needed to communicate in practical health care situations. Students will participate in speaking exercises, dialogue, and role-play activities (field-specific scenarios).

CDS 610. Research Design and Statistics. 3 Hours.
This course will introduce the student to clinical research methods and review concepts involved in descriptive and inferential statistics. Topics covered include, overview of the research process, literature review, research hypothesis, research designs, sample selection, measurement methods, descriptive statistics, and inferential statistics.

CDS 625. Analysis of Scientific Publications. 3 Hours.
This course is designed to prepare students to critically evaluate medical/scientific literature and to write a master¿s level papers. The ability to critically analyze scientific publications will be incorporated into the process of making medical decisions.

Biomedical and Health Sciences

Prospective students visit http://www.uab.edu/shp/home/degrees-certificates/grad-professional-degrees to obtain specific admissions requirements on how to apply to the Graduate School.

Degrees Offered:	M.S.
Co-Directors:	Mamie T. Coats, PhD and Michael Herr, PhD
Phone:	(205) 996-0277 (Dr. Coats); (205) 975-0021 (Dr. Herr)
E-mail:	mamiec@uab.edu; mjherr@uab.edu

Program Information

Program Mission

The mission of the Master of Science degree program in Biomedical and Health Sciences is to provide coursework and experiences that can help you make the transition from undergraduate to medical, dental, optometry, physician assistant, physical therapy, occupational therapy, and other health science professional programs.

Admission Requirements

In addition to the general Graduate School admission requirements, applicants to the M.S. program must:

- Have a minimum science GPA of 3.0 (A=4.0), computed from all coursework in biology, chemistry, mathematics, and physical sciences,
- Submit a personal statement of interest to the program,
- Submit three letters of recommendation,
- If foreign educated, have a score of at least 550 for paper version (or 80 for Internet version; or 213 for computer version) on the TOEFL, submit a transcript evaluation from World Education Services (WES) at www.wes.org

If accepted, students must complete the UAB medical history questionnaire and physical, provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service before enrollment. A background check and drug screen will be required at program admission.

Persons with a Bachelor of Science degree may be eligible to register for courses as non-degree seeking graduate students before acceptance into the M.S. program at the discretion of the program co-directors. If a non-degree seeking graduate student meets the M.S. program admission requirements, up to 12 semester hours of approved non-degree graduate coursework may be accepted for the M.S. degree. Admission of a student to any course as a non-degree seeking student does not constitute or guarantee admission to the M.S. degree program. Non-degree seeking students will be eligible to meet with M.S. BHS advisors to discuss course selections and planning for future enrollment in either the M.S. BHS program or the graduate health professional school of their choice.

Essential Functions

Essential functions are physical abilities, mental abilities, skills, attitudes, and behaviors the students must evidence or perform at each stage of their education. The absence of an essential function would fundamentally alter a student's ability to meet the program goals. The essential functions for the BHS program include commitment to learning, interpersonal skills, communication, time management, problem-solving, professionalism, responsibility, critical thinking, and stress management.

If you have a disability but have not contacted Disability Support Services (DSS), please call (205) 934-4205 (voice) or (205) 934-4248 (TDD) or visit the DSS offices at the Hill Student Center, Suite 409, 1400 University Boulevard. Additional information is available at http://www.uab.edu/students/disability/

Accreditation and Certification

None required.

Additional Information

Entry Term:	Summer Semester
Deadline for All Application Materials to be in the Graduate School Office:	March 1
Comments:	Transcript evaluation by WES is required for applicants with foreign university degrees

Contact Information

For detailed information, contact the Department of Clinical and Diagnostic Sciences, Biomedical and Health Sciences Program, UAB School of Health Professions, SHPB 455, 1716 9th Avenue South, Birmingham, Alabama 35294-1212

Telephone: 205-934-7596

E-mail: AskCDS@uab.edu

Master of Science in Biomedical and Health Sciences

Requirements		Hours
BHS 501	Seminar I	1
BHS 502	Molecules and Cells	4
BHS 503	Microbiology and Immunology	4
BHS 550	Integrated Systems I: Neuroendocrine	3
BHS 555	Integrated Systems II: Cardiopulmonary	3
BHS 560	Integrated Systems III: Genitourinary	3
BHS 600	Integrated Systems IV: Gastrointestinal	2
BHS 601	Seminar II	1
BHS 602	Seminar III	1
BHS 605	Integrated Systems V: Musculoskeletal and Skin	3
BHS 610	Clinical Application and Simulation	1-2

BHS 690	Capstone: Integrating Basic and Clinical Sciences	4
Suggested Electives (must have 3 credit hours)		3
BT 605	Applications of Biochemistry in Biotechnology	
CDS 605	Survival Spanish for Health Professionals	
CHHS 602	Advanced Principles of Mental Health, Stress, & Well-being	
KIN 637	Physiology of Exercise I	
PA 550	Introduction to Medical History Taking and Physical Examination	
Any Graduate CDS-prefix elective course (500-600 level)		
Total Hours		**33-34**

Courses

BHS 501. Seminar I. 1 Hour.
The first of a three-course series to prepare students for application, admission, and success in professional school and the biomedical workforce. Topics will include study skills, interview skills, and test taking strategies.

BHS 502. Molecules and Cells. 4 Hours.
Chemical structures and functions of biomolecules and human cells. The disciplines of biochemistry, genetics, cell biology, and histology will be integrated to provide a framework for understanding normal and abnormal cellular states. Topics will include cellular physiology, metabolic pathways, inheritance, molecular genetics, and basic histology.

BHS 503. Microbiology and Immunology. 4 Hours.
Biology of viruses, bacteria, parasites, and fungi as well as the natural human responses to these pathogens. Innate and adaptive immunity will be explored in the context of pathogenic and non-pathogenic assault. Introduction to concepts in general pathology including mechanisms of cell injury and repair, cell adaptation, and inflammation.

BHS 550. Integrated Systems I: Neuroendocrine. 3 Hours.
Integrated study of the nervous and endocrine body systems. The gross anatomy, histology, and physiology of each system will be examined through an integrated approach, which will include a study of the interrelationships of these controlling body systems. Correlations to disease states and disease treatments will be stressed throughout.

BHS 555. Integrated Systems II: Cardiopulmonary. 3 Hours.
Integrated study of the cardiovascular and respiratory body systems. The gross anatomy, histology, and physiology of each system will be examined through an integrated approach, which will include a study of the interrelationships of these systems and the gross anatomy of the thorax. Correlations to disease states and disease treatments will be stressed throughout.

BHS 560. Integrated Systems III: Genitourinary. 3 Hours.
Exploration and integration of the urinary and reproductive systems of the human body, including development and anatomical features and differences between males and females. Microanatomy of kidneys correlated with body fluid homeostasis and urine production, and clinical disorders of the urinary tract. Male and female reproductive tracts' structure, function and gametogenesis. Female menstrual cycle at the level of hormonal regulation, events at the ovary, and changes in the uterus. Microanatomy and physiology of pregnancy. Diseases associated with the genitourinary tracts.

BHS 600. Integrated Systems IV: Gastrointestinal. 2 Hours.
Integrated study of the gastrointestinal body system. The gross anatomy, histology, and physiology of each organ will be examined through an integrated approach, which will include a study of the gross anatomy of the abdomen. Correlations to disease states and disease treatments will be stressed throughout.

BHS 601. Seminar II. 1 Hour.
The second of a three-course series to prepare students for application, admission, and success in professional school and the biomedical workforce. Topics will include professionalism, cultural competence, and ethical behavior.

BHS 602. Seminar III. 1 Hour.
The third of a three-course series to prepare students for application, admission, and success in professional school and the biomedical workforce. Topics will include interpersonal skills and teamwork.

BHS 605. Integrated Systems V: Musculoskeletal and Skin. 3 Hours.
Integrated study of the skeletal, muscular and integumentary body systems. The gross anatomy, histology, and physiology of each system will be examined through an integrated approach, which will include a study of the interrelationships of these systems and the gross anatomy of the back and limbs. Correlations to disease states and disease treatments will be stressed throughout.

BHS 610. Clinical Application and Simulation. 1-2 Hour.
Development of critical thinking skills regarding the effects of disease at various levels of organization on multiple organ systems. Activities will include small-group case studies and simulation.

BHS 675. Special Topics in Biomedical and Health Sciences. 1-4 Hour.
Exploration of current issues in Biomedical and Health Sciences.

BHS 690. Capstone: Integrating Basic and Clinical Sciences. 1-4 Hour.
Integration of knowledge from basic and clinical science courses to define and pose ethical resolutions to problems and clinical cases in the biomedical sciences.

BHS 698. Non-Thesis Research. 4 Hours.
This course will provide students with the opportunity to engage in inquiry and problem solving in the biomedical sciences. Students may engage in a research project or literature review on a topic related to health and disease. A written report will be the culmination of these activities.

Biotechnology

Degree Offered:	M.S. PhD
Program Director:	Tino Unlap, PhD
Phone:	(205) 934-7382
E-mail:	unlap@uab.edu
Website:	http://www.uab.edu/shp/cds/biotech

Program Information

Program Mission

The faculty members of the Biotechnology Programs are devoted to providing excellent service to the community and its graduates. The faculty, in its concern for the health and safety of the general public, is committed to ensuring that each student develops knowledge, skills, and values essential to their appropriate role providing the basis for continuing intellectual and professional growth.

Out of a great concern for applied technology and the role that it plays in the diagnosis, management and treatment of human disease, and in developing products to solve problems for present and future generations, the Biotechnology Programs are designed to provide instruction through didactic and practical training in order to ensure that graduates possess the critical knowledge and skill sets that are required for intellectual and professional growth in the future. Online options are available to give individuals with BS degrees already working in the Life Science industry the opportunity to earn a relevant MS degree or certificate.

Biotechnology Careers

The goal of the Master's degree program is to provide a more direct route to a career in biotechnology by focusing on mastering current techniques used in biotechnology coupled with the business fundamentals necessary for successful product/technology development in the industry. The mufti-disciplinary aspects of this program will broaden and expand the knowledge base of students, thus making graduates particularly useful to potential industry employers. According to the U.S. Department of Labor Occupational Outlook Handbook, the demand in the biotechnology field continues to drive job growth, with much higher expected increases in career opportunities to be realized as compared to all other industries in future years.

The Biotechnology Master of Science degree program requires 3 semesters for completion as full-time students. The Master of Science requires 37 credit hours and is designed for individuals who hold a Bachelor of Science or Bachelor of Arts degree in a related discipline including biology, chemistry, biochemistry, physics, engineering, mathematics, psychology and sociology.

M.S. Admission Requirements

In addition to the general Graduate School admission requirements, applicants to the M.S. program must:

- Have a biology, chemistry, or a related major from an accredited college or university,
- Have a minimum undergraduate GPA of 3.0 (A = 4.0), computed from all undergraduate credits or from the last 60 semester hours of undergraduate course credit,
- Provide a written statement of career goals,
- Complete an interview with the program admissions committee, and
- If foreign-educated, have a score of at least 550 for paper version (or 80 for Internet version; or 213 for computer version) on the TOEFL, submit a transcript evaluation from World Education Services (WES) at www.wes.org.

If accepted, students must complete the UAB medical history questionnaire and physical, provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service before enrollment. Accepted students must complete a background check and drug screen at admission and prior to placement in clinical internships by school policy.

Ph.D. Admission Requirements

In addition to the general Graduate School admission requirements, applicants to the Ph.D. program must:

- Provide a personal statement,
- Provide a resume or curriculum vitae,
- Request three (3) letters of recommendation,
- If foreign-educated, have a score of at least 550 for paper version (or 80 for Internet version; or 213 for computer version) on the TOEFL, submit a transcript evaluation from World Education Services (WES) at www.wes.org.

If accepted, students must complete the UAB medical history questionnaire and physical, provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service before enrollment. Accepted students must complete a background check and drug screen at admission and prior to placement in clinical internships by school policy.

Essential Requirements

Fundamental tasks, behaviors, and abilities necessary to successfully complete the requirements of the Program are available upon request from the Biotechnology program office. If you have a disability, but have not contacted Disability Support Services (DSS), please call 934-4205 or visit http://www.uab.edu/students/disability/.

Additional Information

Entry Term	M.S. - Fall, Spring, and Summer Semesters; Ph.D. - Fall Semester
Deadline for All Application Materials to be in the Graduate School Office:	M.S. - August 1 (Fall), December 1(Spring), May 1(Summer); Ph.D. Fall admission November 30 (priority application deadline) and December 31 (final application deadline)
Entrance Tests:	For international applicants from non- English speaking countries, scores for the Test of English as a Foreign Language (TOEFL) and the Test of Written English(TWE)
Comments:	M.S. Financial aid (fellowship, stipend or assistantship) is not available from the program; scholarship availability is limited; transcript evaluation by WES is required for applicants with foreign university degrees

Contact Information

For detailed information, contact the Department of Clinical and Diagnostic Sciences, Biotechnology Program, UAB School of Health Professions, SHPB 430, 1716 9th Avenue South, Birmingham, Alabama 35294-1212.
Telephone 205-934-3209.
E-mail AskCDS@uab.edu

Master of Science in Biotechnology

Requirements		Hours
BT 500	Principles of Biotechnology - Nucleic Acid Technology	3
BT 550	Principles of Biotechnology - Amino Acid Technology	3
BT 600	Principles of Biotechnology - Systems Biology & Pharmacology	3
BT 650	Applications in Biotechnology I	2
BT 651	Applications in Biotechnology II	2
BT 652	Applications in Biotechnology III	2
BT 670	Bench to Commercialization I	3

BT 671	Bench to Commercialization II	3
BT 672	Bench to Commercialization III	3
BT 690	Capstone: Integrating Basic Science and Product Development	4
BT 695	Biotechnology Internship	2
CDS 505	Professional Skills Development	1
CDS 610	Research Design and Statistics	3
Innovative Technologies in Biotechnology (take three times)		**3**
BT 676	Innovative Technologies in Biotechnology	
Total Hours		**37**

Master of Science in Biotechnology (Online)

Requirements		Hours
BT 500	Principles of Biotechnology - Nucleic Acid Technology	3
BT 550	Principles of Biotechnology - Amino Acid Technology	3
BT 600	Principles of Biotechnology - Systems Biology & Pharmacology	3
BT 605	Applications of Biochemistry in Biotechnology	3
BT 670	Bench to Commercialization I	3
BT 671	Bench to Commercialization II	3
BT 672	Bench to Commercialization III	3
BT 675	Special Topics in Biotechnology	3
Innovative Technologies in Biotechnology (1 credit; take three times)		3
BT 676	Innovative Technologies in Biotechnology	
BT 695	Biotechnology Internship	2
BT 698	Non-Thesis Research	4
CDS 505	Professional Skills Development	1
CDS 610	Research Design and Statistics	3
Total Hours		**37**

Biotechnology, PhD

Program Information

The PhD program in Biotechnology offers a completely new approach to doctoral learning, blending traditional scholarly research and pedagogy with practicum-based learning that ultimately will provide graduate students with unique and highly marketable skillsets. Specifically, core training in the program will span from scientific discovery to the collection of proof-of-concept data and the development of intellectual property, and the analysis of market opportunities and business plans for a novel product, all with the goal to officially launch a biotechnology company post-graduation. In addition to scientific discovery capability, the biotechnology doctoral students will graduate with the knowledge and skills needed to successfully conduct and evaluate research within the setting of a biotechnology company and will have acquired the knowledge of biotechnology economics, regulatory affairs, how to launch a biotechnology company, and the finance skills specific to moving a biotechnology product and company forward. Upon graduation, the successful student will be equipped to launch a biotechnology company or market a patented product post-graduation.

Degree Requirements

The 78-credit-hour curriculum comprises didactic instruction, laboratory training, and mentored and independent research. Students will have the opportunity to complete either the existing Biotechnology Regulatory Graduate Certificate or the Technology Commercialization and Entrepreneurship Graduate Certificate, concurrently with the doctoral degree. Upon completion of didactic course work, students will be expected to pass a competency examination relevant to content in laboratory and lecture courses before they can transition to internships and dissertation work. This examination will be comprised of written, oral, and practical components and generally will be completed in Semester 7.

Requirements		Hours
Core Requirements		
BT 701	Cellular and Molecular Biotechnology I	3
BT 702	Cellular and Molecular Biotechnology II	3
BT 670	Bench to Commercialization I	3
BT 671	Bench to Commercialization II	3
BT 725	Creating a Biotechnology Venture	3
BT 730	Managing and Leadership in Biotechnology	3
BT 732	Financing a Biotechnology Venture	3
BT 750	Laboratory Rotation I	1
BT 751	Laboratory Rotation II	1
BT 752	Laboratory Rotation III	1
Required Courses		
GBS 701	Core Concepts in Research: Critical Thinking & Error Analysis	1
GBS 716	Grantsmanship and Scientific Writing	3
GRD 717	Principles of Scientific Integrity	3
BT 745	Research Design and Statistics for Biotechnology	3
BT 740	Biotechnology Seminar/Journal Club * 1 credit hour course taken three terms	3
BT 753	Advanced Applications in Biotechnology	3
BT 675	Special Topics in Biotechnology	2
BTR 605	Biotechnology Regulatory & Quality Systems	3
Certificate Requirements or Electives		9
Non-Dissertation/Dissertation Research Requirements		
BT 798	Nondissertation Research	6
BT 799	Dissertation Research	12
Recommended Electives		
GBS 753	Intro to Pharmacology & Toxicology	
GBS 762	Virology	
GBS 728	JC- Bio-Nano Technology	
BTR 615	Applications of Biological Processes in Drug Development	
BTR 620	Regulation of Food and Drugs	
BTR 640	Clinical Development of Drugs, Biologics, Diagnostics, and Medical Devices	
BTR 690	Clinical Trial Implementation	
BT 797	Independent Study	
Total Hours		**72**

Graduate Certificate in Biotechnology Regulatory Affairs

Requirements		Hours
BTR 605	Biotechnology Regulatory & Quality Systems	3
BTR 615	Applications of Biological Processes in Drug Development	3
BTR 620	Regulation of Food and Drugs	3
BTR 640	Clinical Development of Drugs, Biologics, Diagnostics, and Medical Devices	3
BTR 690	Clinical Trial Implementation	3
Total Hours		**15**

Program Information

Program Mission

As the biotechnology industry grows and life science companies mature, there is an increasing demand for a workforce trained in regulatory affairs to ensure that therapeutics, biologics, diagnostics and medical device products progress successfully through the development, manufacturing and marketing processes. Currently, there are thousands of ongoing clinical trials of new drugs, with many of them soon to be approved and ready for full-scale production, resulting in an all-time high demand for individuals with regulatory training.

The Biotechnology Regulatory Affairs certificate program is designed to provide students with targeted training and education in:

- The philosophies and roles of the domestic and international regulatory agencies that oversee drug, biologic, device, and diagnostics development,
- The laws that govern the development, manufacturing and commercial distribution of drugs, biologics and medical devices,
- The analysis of how emerging developments and trends are reshaping drug development and medical device regulation,
- The biological processes and laboratory techniques utilized for the discovery, development and evaluation of therapeutic drugs,
- Major concepts under which clinical trials are designed and run,
- The roles of the U.S. Food and Drug Administration (FDA), Institutional Review Boards, the Code of Federal Regulations and ethical principles,
- The complexities of clinical trial initiation and the issues of site and data management.

Essential Requirements

Fundamental tasks, behaviors, and abilities necessary to successfully complete the requirements of the Program are available upon request from the Biotechnology program office. If you have a disability but have not contacted Disability Support Services (DSS), please call 934-4205 or visit http://www.uab.edu/students/disability/.

Additional Information

Contact Information

For detailed information, contact the Department of Clinical and Diagnostic Sciences, Biotechnology Program, UAB School of Health Professions, SHPB 430, 1716 9th Avenue South, Birmingham, Alabama 35294-1212.
Telephone 205-934-3209.
E-mail AskCDS@uab.edu

Courses

BT 500. Principles of Biotechnology - Nucleic Acid Technology. 3 Hours.
Theories and knowledge required for the development and commercialization of nucleic acid-based technology for the biotechnology industry including genes, cloning, detection, therapies, diagnostics, and analysis.

BT 550. Principles of Biotechnology - Amino Acid Technology. 3 Hours.
Theories and knowledge required for the development and commercialization of amino acid-based technology for the biotechnology industry including protein-based therapeutics, diagnostics, vaccines, and research reagents.

BT 600. Principles of Biotechnology - Systems Biology & Pharmacology. 3 Hours.
Theories and knowledge required for the understanding of the science and technology of systems biology and pharmacology.

BT 605. Applications of Biochemistry in Biotechnology. 3 Hours.
Current concepts of human biochemistry and molecular biology; protein structure and function, enzymes, intermediary metabolism, biosynthesis of lipids, and utilization of lipids; special emphasis on the molecular basis of inherited genetic diseases, acquired diseases, and clinically-related biochemistry in Biotechnology.

BT 650. Applications in Biotechnology I. 2 Hours.
Lab provides the opportunity to set-up, perform, and interpret the results of various molecular assays. These include, but are not limited to, the following: nucleic acid isolation, enzymatic manipulation of nucleic acids, gel electrophoresis, amplifications reactions and hybridization reactions. Most of the laboratory work will involve a eukaryotic system.

BT 651. Applications in Biotechnology II. 2 Hours.
A laboratory that prepares students for the biotechnology industry by teaching how recombinant DNA can be used to generate specific proteins in any protein expression system.

BT 652. Applications in Biotechnology III. 2 Hours.
Laboratory applications required for the research and development of nucleic acid and amino acid based technology for the biotechnology industry.

BT 670. Bench to Commercialization I. 3 Hours.
Focus on growth of a biotechnology company from inception through the early stages of development. Topics will include market assessment, business plan development, raising capital, and regulatory and quality systems requirements for drugs, biologics, medical devices or combination products.

BT 671. Bench to Commercialization II. 3 Hours.
Focus is on the issues and challenges affecting the life cycle of a biotechnology company and product as it progresses through the different stages of development including regulatory strategies, financing strategies, business development, and marketing strategies.

BT 672. Bench to Commercialization III. 3 Hours.
Focus is on the role of managers and leaders within biotechnology companies as they undergo constant change. The course will review effective communication strategies, problem solving tactics, leadership skills and development of methods to implement change. Students will focus on developing writing, verbal, and presentation skills through a series of projects.

BT 675. Special Topics in Biotechnology. 1-4 Hour.
Exploration of current issues in Biotechnology.

BT 676. Innovative Technologies in Biotechnology. 1 Hour.
An overview of new and innovative technologies used in the discovery, development, and production of biotechnology products. This will include a series of guest speakers who have successfully discovered novel technologies and products and transitioned them into early-stage companies.

BT 690. Capstone: Integrating Basic Science and Product Development. 1-4 Hour.
Synthesis of biotechnology knowledge used to develop innovative products for the life science industry. Application of product phases including the discovery, preclinical, clinical, FDA review and post-marketing surveillance. Working on teams, to select products/medical devices and critically evaluate how these products were developed and identify strengths and weaknesses in each phase of development.

BT 695. Biotechnology Internship. 2 Hours.
Supervised basic research in areas including molecular biology, protein chemistry, drug discovery, cardiovascular diseases, neurodegenerative diseases and cancer. Students are trained in research planning and execution, problem-solving, team work, and data analysis and presentation.

BT 698. Non-Thesis Research. 1-4 Hour.
Non Thesis Research.

BT 701. Cellular and Molecular Biotechnology I. 3 Hours.
Study of prokaryotic systems focusing on structures, functions and replicative processes with particular emphasis on the systems that are used in the Biotechnology Industry, especially bacteria. The students will learn the central dogma in prokaryotes from DNA replication to transcription and translation and the sorting of proteins to various destinations using different transport systems. Bacterial enzymes, including restrictions endonucleases, will be examined and the use of these enzymes to develop innovative products for the life science industry.

BT 702. Cellular and Molecular Biotechnology II. 3 Hours.
Study of the principles of cellular and molecular biology using innovative life science technologies to demonstrate the biological mechanisms that were used to develop these products. General topics will include DNA replication, DNA repair, DNA Transcription, Posttranscriptional Modifications, Translation, and Posttranslational Modifications. Existing technologies will be discussed under the appropriate topic in order to enable the students to see how a particular biological process leads to the development of a number of innovative technologies.

BT 725. Creating a Biotechnology Venture. 3 Hours.
An in-depth look at starting a new biotechnology company. Specifically, the course will provide a roadmap for starting a company with an overview of the challenges and opportunities that biotechnology start-ups face.

BT 730. Managing and Leadership in Biotechnology. 3 Hours.
Leadership skills, communication, conflict resolution and organizational structures specific to biotechnology companies.

BT 732. Financing a Biotechnology Venture. 3 Hours.
Provide students with limited knowledge in finance the ability to understand the financial basics unique to running a biotechnology company from inception through commercialization.

BT 740. Biotechnology Seminar/Journal Club. 1 Hour.
Assigned readings, student presentations, and discussion of current literature and development activity in the life sciences and biotechnology industries.

BT 745. Research Design and Statistics for Biotechnology. 3 Hours.
Issues of contemporary research design and methods in biotechnology; focus on translational research and areas of controversy; application of statistical software with emphasis on interpretation of findings for decision support.

BT 750. Laboratory Rotation I. 1 Hour.
First in series of three laboratory rotations completed during the first two years of graduate study. Each laboratory rotation is 8-12 weeks in duration, and will be designed to allow the student to explore a potential avenue of research for their dissertation and project deliverable.

BT 751. Laboratory Rotation II. 1 Hour.
Second in series of three laboratory rotations completed during the first two years of graduate study. Each laboratory rotation is 8-12 weeks in duration, and will be designed to allow the student to explore a potential avenue of research for their dissertation and project deliverable.

BT 752. Laboratory Rotation III. 1 Hour.
Third in series of three laboratory rotations completed during the first two years of graduate study. Each laboratory rotation is 8-12 weeks in duration, and will be designed to allow the student to explore a potential avenue of research for their dissertation and project deliverable.

BT 753. Advanced Applications in Biotechnology. 3 Hours.
Basic molecular techniques used in research from bacterial culture to gene regulation. Techniques will be taught under the umbrella of a research project which will involve the cloning of a mammalian gene into an expression vector, its purification, sequencing, transfection into a mammalian cell host and the detection of the protein product. The techniques used will include PCR, cloning, transformation, plasmid isolation, DNA sequencing, transfection and protein detection using immunofluorescence and Western blot techniques.

BT 770. Drug Discovery. 3 Hours.
Overview of pharmaceutical development from target identification through pre-clinical development; focus on small molecule and biological products.

BT 772. Medicinal Chemistry. 3 Hours.
Comprehensive overview of concepts related to actions and clinical uses of major classes of drugs from their chemical structures; focus on structure-activity relationships, pharmacokinetics, and pharmacodynamics.

BT 795. Special Topics in Biotechnology. 1-4 Hour.
Special topics in Biotechnology.

BT 797. Independent Study. 1-3 Hour.
Student exploration of topic specific to their research agenda.

BT 798. Nondissertation Research. 1-9 Hour.
Independent student research to prepare dissertation proposal. Mentored by appointed Graduate Study Committee. Continuous registration is required until student is admitted to candidacy.

BT 799. Dissertation Research. 1-12 Hour.
Independent student research to complete dissertation project and written report. Mentored by appointed Graduate Study Committee.

Biotechnology Regulatory Affairs Certificate

Degree Offered:	Graduate Certificate in Biotechnology Regulatory Affairs
Program Coordinator:	Kimberly McCall, PhD
Phone:	(205) 934-3209
E-Mail:	biotech@uab.edu
Website:	https://www.uab.edu/shp/cds/biotechnology-regulatory-affairs

Program Information

Program Mission

As the biotechnology industry grows and life science companies mature, there is an increasing demand for a workforce trained in regulatory affairs to ensure that therapeutics, biologics, diagnostics and medical device products progress successfully through the development, manufacturing and marketing processes. Currently, there are thousands of ongoing clinical trials of new drugs, with many of them soon to be approved and ready for full-scale production, resulting in an all-time high demand for individuals with regulatory training.

The Biotechnology Regulatory Affairs certificate program is designed to provide students with targeted training and education in:

- The philosophies and roles of the domestic and international regulatory agencies that oversee drug, biologic, device, and diagnostics development,
- The laws that govern the development, manufacturing and commercial distribution of drugs, biologics and medical devices,
- The analysis of how emerging developments and trends are reshaping drug development and medical device regulation,
- The biological processes and laboratory techniques utilized for the discovery, development and evaluation of therapeutic drugs,
- Major concepts under which clinical trials are designed and run,
- The roles of the U.S. Food and Drug Administration (FDA), Institutional Review Boards, the Code of Federal Regulations and ethical principles,
- The complexities of clinical trial initiation and the issues of site and data management.

Essential Requirements

Fundamental tasks, behaviors, and abilities necessary to successfully complete the requirements of the Program are available upon request from the Biotechnology program office. If you have a disability, but have not contacted Disability Support Services (DSS), please call 934-4205 or visit http://www.uab.edu/students/disability/.

Additional Information

Entry Term:	Fall Semester
Deadline for All Application Materials to be in the Graduate School Office:	February 28 (Early Acceptance); August 1 (Final Acceptance)
Number of Evaluation Forms Required:	None
Entrance Tests:	For international applicants from non-English speaking countries, scores for the Test of English as a Foreign Language (TOEFL) and the Test of Written English (TWE)
Comments:	Financial aid (fellowship, stipend, or assistantship) is not available from the program; scholarship availability is limited; transcript evaluation by WES is required for applicants with foreign university degrees

Contact Information

For detailed information, contact the Department of Clinical and Diagnostic Sciences, Biotechnology Program, UAB School of Health Professions, SHPB 430, 1716 9th Avenue South, Birmingham, Alabama 35294-1212.
Telephone 205-934-3209.
E-mail AskCDS@uab.edu

Graduate Certificate in Biotechnology Regulatory Affairs

Requirements		Hours
BTR 605	Biotechnology Regulatory & Quality Systems	3
BTR 615	Applications of Biological Processes in Drug Development	3
BTR 620	Regulation of Food and Drugs	3
BTR 640	Clinical Development of Drugs, Biologics, Diagnostics, and Medical Devices	3
BTR 690	Clinical Trial Implementation	3
Total Hours		**15**

Courses

BTR 605. Biotechnology Regulatory & Quality Systems. 3 Hours.
U.S. and European Union regulatory affairs frameworks and practices governing the development, approval, manufacturing and surveillance of pharmaceuticals and medical devices, including in vitro diagnostic products. Regulations covered include investigational new drug applications (IND), new drug applications (NDA), good laboratory practices (GLP), good clinical practices (GCP) and current good manufacturing practices (cGMP).

BTR 615. Applications of Biological Processes in Drug Development. 3 Hours.
Overview of biological processes and laboratory techniques for discovery, development and evaluation of therapeutic drugs. Focus on drug development processes such as gene cloning, culture scale-up, downstream processing, and product purification. Emphasis on theory and application of laboratory methods used in drug development.

BTR 620. Regulation of Food and Drugs. 3 Hours.
Administrative procedures followed by the FDA; enforcement activities of the FDA, including searches, seizure actions, injunctions, criminal prosecutions, and civil penalties authorized by statutes.

BTR 640. Clinical Development of Drugs, Biologics, Diagnostics, and Medical Devices. 3 Hours.
Major concepts under which clinical trials are designed and run. Focus on phases of clinical trial development, role of the U.S. Food and Drug Administration, Institutional Review Boards, and the Code of Federal Regulations and ethical principles.

BTR 675. Special Topics in Biotechnology Regulatory Affairs. 1-4 Hour.
Exploration of current issues in Biotechnology Regulatory Affairs.

BTR 690. Clinical Trial Implementation. 3 Hours.
Activities involved in running a clinical trial from study initiation to study close-out. Complex details and issues associated with study initiation, site and data management, preparation of the final report and study close-out.

Medical Laboratory Sciences

Degrees Offered:	M.S.
Director:	Floyd Josephat, EdD
Phone:	(205) 934-1348
E-mail:	josephat@uab.edu
Website:	http://www.uab.edu/shp/cds/clinical-laboratory-sciences

Program Information

Program Mission

The Faculty of the Medical Laboratory Sciences program is committed to service to the community and to providing high quality education to prepare students with a solid educational background and a set of skills translatable to a variety of laboratory settings including hospital laboratories, industry, research laboratories, and many more. The Faculty, in its concern for the health and safety of the general public, is committed to ensuring that each student develops knowledge, skills and values essential to the appropriate role providing the basis for continuing intellectual and professional growth.

M.S. Admission Requirements

In addition to the general Graduate School admission requirements, applicants to the M.S. program must:

- Have a biology, chemistry, or a related major from an accredited college or university,
- Have a minimum undergraduate GPA of 3.0 (A = 4.0), computed from all undergraduate credits or from the last 60 semester hours of undergraduate course credit,
- Provide a written statement of career goals,
- If foreign-educated, have a score of at least 550 for paper version (or 80 for Internet version; or 213 for computer version) on the TOEFL, submit a transcript evaluation from World Education Services (WES) at www.wes.org

If accepted, students must complete the UAB medical history questionnaire and physical, provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service before enrollment. A background check and drug screen will be required at program admission and prior to clinical placement.
Persons with a Bachelor of Science degree may be eligible to register for courses as non-degree seeking graduate students before acceptance into the M.S. program. If a non-degree seeking graduate student meets the M.S. program admission requirements, up to 12 semester hours of approved non-degree graduate coursework may be accepted for the M.S. degree. Admission of a student to any course as a non-degree student does not constitute admission to the M.S. degree program.

Essential Functions

Essential functions are fundamental tasks, behaviors, and abilities necessary to successfully complete the requirements of the Program.
A full list of the essential functions of the program is available from the CLS website under the link *Admission* (http://www.uab.edu/shp/cds/clinical-laboratory-sciences). Essential functions are physical abilities, mental abilities, skills, attitudes, and behaviors the students must evidence or perform at each stage of their education. The absence of an essential function would fundamentally alter a student's ability to meet the program goals. The essential requirements include categories of observation, movement, communication, intellect, and behavior.

If you have a disability, but have not contacted Disability Support Services (DSS), please call 934-4205 or visit the DSS offices at 1701 9th Avenue South. Additional information is available at http://www.uab.edu/students/disability/.

Accreditation and Certification

The program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences. Program graduates are eligible to apply for the certification examination offered by the American Society of Clinical Pathology Board of Certification (ASCP-BOC).

NAACLS

5600 N River Road, Suite 720
Rosemont, IL 60018-5119
Phone: 847.939.3597
Fax: 773.714.8886
URL: http://www.naacls.org/

ASCP Board of Certification

33 West Monroe Street, Suite 1600
Chicago, IL 60603
Phone: 312.541.4999
Fax: 312.541.4998
URL: http://www.ascp.org/

Additional Information:

Entry Term:	Fall semester
Deadline for All Application Materials to be in the Graduate School Office:	Early Admission: February 1; Regular Admission: May 1
Entrance Tests:	GRE and for international applicants from non- English speaking countries, scores for the Test of English as a Foreign Language (TOEFL) and the Test of Written English(TWE)
Comments:	Scholarship money is available, but is limited; transcript evaluation by WES is required for applicants with foreign university degrees

Contact Information

For detailed information, contact the Department of Clinical and Diagnostic Sciences, Medical Laboratory
Sciences Program, UAB School of Health Professions, SHPB 430, 1716 9th Avenue South, Birmingham,
Alabama 35294-1212.
Telephone 205-934-3209.
E-mail AskCDS@uab.edu

Master of Science in Medical Laboratory Science

Requirements		Hours
CLS 502	Fundamentals of Phlebotomy and Body Fluid Collection	1
CDS 505	Professional Skills Development	1

CDS 610	Research Design and Statistics	3
CDS 625	Analysis of Scientific Publications	3
CLS 501	Introduction to the Clinical Laboratory	3
CLS 503	Body Fluids	1
CLS 504	Lab Analysis of Body Fluids	1
CLS 505	Laboratory Management	3
CLS 518	Immunology	3
CLS 523	Clinical Microbiology	3
CLS 524	Clinical Microbiology Laboratory	1
CLS 526	Instrumentation & Automation	2
CLS 527	Instrumentation and Automation Laboratory	1
CLS 528	Hematology I	3
CLS 529	Hematology I Laboratory	1
CLS 530	Immunohematology	4
CLS 531	Immunohematology Laboratory	1
CLS 532	Hematology II	3
CLS 533	Hematology II Laboratory	1
CLS 538	Infectious Diseases	3
CLS 539	Infectious Diseases Laboratory	1
CLS 542	Molecular Diagnostics	3
CLS 543	Molecular Diagnostics Lab	1
CLS 551	Clinical Chemistry	4
CLS 552	Clinical Chemistry Laboratory	1
CLS 560	Clinical Correlations	3
CLS 570	Professional Development	1
CLS 595	Clinical Practice	12
CLS 698	Master's Level Non-Thesis Research	4
Total Hours		**72**

Courses

CLS 501. Introduction to the Clinical Laboratory. 3 Hours.
Overview of issues and skills surrounding working in the modern laboratory environment; introduction to roles and functions of a medical laboratory scientist; includes safety, equipment, mathematics, measurements, microscopy, dilutions, quality assurance, regulations of the laboratory, laboratory operations, and educational principles.

CLS 502. Fundamentals of Phlebotomy and Body Fluid Collection. 1 Hour.
An in depth course in phlebotomy covering aspects of safety procedures, hygiene, capillary puncture, venipuncture, arterial access and maintenance, intravenous access and maintenance, drug administration via IV, intramuscular and subcutaneous methods and non-blood collections of bodily fluids.

CLS 503. Body Fluids. 1 Hour.
Diagnosis and monitoring of renal and systemic disease through the physical, biochemical, and microscopic analysis of urine and feces. Diagnosis of central nervous system and systemic disease through cerebrospinal fluid analysis. Diagnosis of metabolic and infectious disease through analysis of peritoneal fluid, synovial fluid, transudates, and exudates. Fertility testing using semen analysis.

CLS 504. Lab Analysis of Body Fluids. 1 Hour.
Application of diagnosis and monitoring of renal and systemic disease through the physical, biochemical, and microscopic analysis of urine and feces. Diagnosis of central nervous system and systemic disease through cerebrospinal fluid analysis. Diagnosis of metabolic and infectious disease through analysis of peritoneal fluid, synovial fluid, transudates, and exudates. Fertility testing using semen analysis.

CLS 505. Laboratory Management. 3 Hours.
Roles and functions of clinical laboratories and practitioners; professionalism and ethics; educational methodology and training; professional and interpersonal communication; behavioral aspects of management; leadership styles and management theory; team-building; legal issues related to employment; recruitment, interview and selection of personnel; organizational culture and behavioral change; laboratory operations; safety, governmental regulations, standards and compliance; marketing, outreach, and business plan; budget, cost analysis, reimbursement; critical pathways, decision-making, test utilization; performance improvement, quality assessment; risk management, evidence-based laboratory medicine.

CLS 518. Immunology. 3 Hours.
Physiology of immune responses to infectious agents, tumors, transplant; abnormal responses:hypersensitivity,autoimmunity, immunoproliferative disorders, and immunodeficiencies; antigen-antibodt reaction; complement; application of immunologic tests.

CLS 523. Clinical Microbiology. 3 Hours.
Reservoirs, modes of transmission, disease associations, and morphological and biochemical characteristics of microorganisms commonly isolated in the clinical laboratory; methods used to isolate and identify bacteria, parasites, and fungi.

CLS 524. Clinical Microbiology Laboratory. 1 Hour.
Performance of techniques and tests used in the isolation and identification of bacteria, fungi, and parasites commonly seen in a clinical microbiology laboratory.

CLS 526. Instrumentation & Automation. 2 Hours.
Study of the theory and principles of automation and instrumentation used in laboratories emphasis will be placed on quality control, quality assurance, instrumentation principles, basic statistics, and the regulatory, and economic issues encountered in laboratories including, clinical labs, health labs, government labs, private labs and other laboratories.

CLS 527. Instrumentation and Automation Laboratory. 1 Hour.
Practical application of automation and instrumentation used in laboratories. Emphasis will be placed on quality control, quality assurance, instrumentation principles, basic statistics, and the regulatory, and economic issues encountered in laboratories including, clinical labs, health labs, government labs, private labs and other laboratories.

CLS 528. Hematology I. 3 Hours.
Systematic examination of blood cells: normal function; recognizing their microscopic appearance; blood cell disorders; standard and special clinical hematology laboratory procedures; validation of laboratory data; interpretation of results, and quality assurance.

CLS 529. Hematology I Laboratory. 1 Hour.
Practical application of Hematology I as applicable to diagnostic assays in clinical laboratories. An emphasis will be placed on hematology lab principles; complete blood count analysis, manual hematology procedures, automated and manual differentials, cell identification, procedural determination of various clinical diseases and disorders (anemia, leukemia etc.,) quality control and quality assurance procedures in the hematology lab.

CLS 530. Immunohematology. 4 Hours.
Immunogenetics, serological characteristics, and clinical significance of blood group systems; antibody identification; pretransfusion testing and problem-solving; donor blood collection; component preparation; transfusion and cellular therapy; investigation and treatment of immune hemolytic disorders.

CLS 531. Immunohematology Laboratory. 1 Hour.
Red cell phenotyping, antibody detection and identification, pretransfusion testing, and laboratory investigation to diagnosis and treat hemolyticanemias.

CLS 532. Hematology II. 3 Hours.
Structure and function of hematopoietic and lymphatic tissue. Stem cell differentation, hematopoiesis, erythrocyte and leukocyte kinetics. Laboratory diagnosis and case management of anemia, lymphoma, myeloma, acute and chronic cell morphology, cell population scatter plots and histograms, cytochemistry, immunophenotyping, molecular methods, and cytogenetics. Hematology laboratory problem solving.
Prerequisites: CLS 528 [Min Grade: C]

CLS 533. Hematology II Laboratory. 1 Hour.
Practical application as applicable to diagnostic assays in clinical laboratories. An emphasis will be placed on hematology lab principles; complete blood count analysis, manual hematology procedures, normal and abnormal peripheral blood smear differentials, cell identification, procedural determination of various clinical diseases and disorders (anemia, leukemia etc.,) bone marrow analysis, quality control and quality assurance procedures in the hematology lab.

CLS 538. Infectious Diseases. 3 Hours.
Pathogenic mechanisms of infectious diseases; normal flora and pathogens of various body sites; methods for collection, transport, and culturing different types of clinical specimens; interpretation of cultures.
Prerequisites: CLS 523 [Min Grade: C]

CLS 539. Infectious Diseases Laboratory. 1 Hour.
Performance and interpretation of direct Gram stains; culturing various types of clinical specimens for isolation of bacteria; performing and interpreting tests used in the identification of potential pathogens; reporting culture results; antimicrobial susceptibility and resistance testing.
Prerequisites: CLS 524 [Min Grade: C]

CLS 542. Molecular Diagnostics. 3 Hours.
Study of molecular biochemistry, medical genetics, molecular pathophysiology, and the theory of molecular tests.

CLS 543. Molecular Diagnostics Lab. 1 Hour.
Practical application of the isolation of nucleic acids, analysis of nucleic acids and protein, cytogenetics, and the interpretation of various molecular methods.

CLS 551. Clinical Chemistry. 4 Hours.
Theory of clinical laboratory techniques to identify and quantitate chemical analytes in body fluids and the correlation of these analytes to human disease.

CLS 552. Clinical Chemistry Laboratory. 1 Hour.
Performance of laboratory techniques used to identify and quantitate chemical analytes in body fluids and the correlation of these analytes to human disease.

CLS 560. Clinical Correlations. 3 Hours.
Correlate clinical, technical and analytical proficiencies that comprise clinical laboratory science practice. Analyze and interpret case studies through selection, application, and interpretation of clinical laboratory protocols.
Prerequisites: CLS 532 [Min Grade: C](Can be taken Concurrently) and CLS 538 [Min Grade: C](Can be taken Concurrently) and CLS 551 [Min Grade: C](Can be taken Concurrently)

CLS 570. Professional Development. 1 Hour.
Review of medical technology/ clinical laboratory science body of knowledge with required comprehensive trial certification final examination using self-directed online materials. Experience with the development of a personal certification maintenance plan to meet requirements defined by national certification agencies in Clinical Laboratory Sciences.

CLS 595. Clinical Practice. 1-12 Hour.
Directed clinical practice in immunohematology laboratory procedures and methods, problem-solving, quality assurance, preventive maintenance, and safety.

CLS 686. Special Topics in Clinical Laboratory Sciences. 1-4 Hour.
Selected advanced topics of current scientific, clinical, and professional importance; specific topics designed to meet student need and interest.

CLS 698. Master's Level Non-Thesis Research. 1-6 Hour.

CLS 699. Thesis Research. 1-6 Hour.
Implementation of research. Must be admitted to master level candidacy. Must have approval IRB. Must have a 3 member committee approved by the graduate dean.
Prerequisites: GAC M

Genetic Counseling

Degree Offered:	M.S.
Program Director:	R. Lynn Holt
Phone:	(205) 975-4237
E-mail:	lynnholt@uab.edu
Website:	www.uab.edu/msgc

Master of Science in Genetic Counseling

Accreditation:

The Genetic Counseling Program is fully accredited by the Accreditation Council for Genetic Counseling (ACGC). The program received full accreditation in 2013 and was approved again 2018 for an additional eight years. Fully accredited programs must complete a rigorous process to demonstrate that the program is capable of meeting the criteria for a genetic counseling training program as established by ACGC. Programs that successfully complete this process are awarded full accreditation. All graduates of an accredited program are eligible for the board examination offered by the American Board of Genetic Counseling, Inc. (ABGC) and state licensure.

Admission Requirements

- Baccalaureate degree from a regionally accredited college/university
- A minimum cumulative undergraduate grade point average of at least 3.0 (A = 4.0)
- A minimum GPA of 3.0 in natural science courses
- A minimum cumulative grade point average of 3.0 in the program prerequisite courses, with a minimum grade of C in each (prerequisite courses are listed below)
- Resume or CV: This should include academic qualifications, a description and timeline of any paid or volunteer work experience in crisis counseling or peer counseling setting, advocacy work (working with individuals with genetic conditions or disabilities, other special populations), paid or volunteer experience as a genetic counseling assistant (GCA) technical work in laboratories, research,

or teaching experience, and any other relevant information, such as job shadowing.

- A personal statement (no more than 500 words) highlighting your motivation to become a genetic counselor and emphasizing your prior and current experiences and how they will benefit you in the profession.
- Job shadowing is strongly encouraged.
- Interview with UAB faculty
- Three letters of recommendation
- Satisfactory screening on health data questionnaire by the UAB Medical Center Student Health Service.
- Complete a criminal background check and drug screen at program admission and again prior to clinical placement as required by school policy.
- Registration with National Matching Services.
- The following course prerequisites:
  - Biology (one full-year course sequence)
  - Biochemistry (one upper level semester course)
  - Genetics (one semester course to include Mendelian and molecular genetics)
  - General Psychology (one semester)
  - Statistics (one semester)

Degree Requirements

The graduate program in genetic counseling will follow the Plan II (non-thesis) option.

Program Curriculum

First Year	
First Term	**Hours**
GC 501	3
GC 510	3
GC 560	1
GC 725	3
CDS 505	1
CDS 610	3
ECG 621	3
	17

Total credit hours: 17

First Year	
Second Term	**Hours**
GC 504	3
GC 505	3
GC 506	3
GC 560	1
ANSC 656	2
ECG 638	3
	15

Total credit hours: 15

First Year	
Summer Term	**Hours**
GC 650	2
GC 651	4
GC 698	1
	7

Total credit hours: 7

Second Year	
First Term	**Hours**
GC 560	1
GC 600	2
GC 652	2
GC 653	2
GC 698	1
CDS 605	1
	9

Total credit hours: 9

Second Year	
Second Term	**Hours**
GC 560	1
GC 602	2
GC 654	2
GC 655	2
GC 698	1-3
	8-10

Total credit hours: 8-10

Additional Information

Deadline for Entry Term(s):	January 7
Deadline for All Application Materials to be in the Graduate School Office:	January 15
Number of Evaluation Forms Required:	Three
Entrance Tests:	TOEFL and TWE also required for international applicants whose native language is not English.

Essential Functions

In order to successfully complete the degree requirements for the curriculum for the Master of Science (M.S.) in Genetic Counseling Program, students must complete the academic and clinical practice requirements of the program in preparation to practice as an entry-level genetic counselor (s). As defined by the program's accrediting body, the Accreditation Council for Genetic Counseling, an entry level genetic counselor may demonstrate mastery of a broad body of genetics knowledge, and develop skills in the following domains: Genetic Expertise and Analysis; Interpersonal, Psychosocial and Counseling Skills; Education; and Professional Development and Practice. Graduate training is a rigorous and intense training process that places specific requirements and demands on enrolled students. The essential functions below extend beyond academic requirements for admission and are standards that all enrolled students must possess in order to successfully complete graduate training. All genetic counseling students must meet the following requirements:

- Communicate effectively and sensitively with patients and members of the health care team.

- Possess the mental capacity for critical thinking including the ability to assimilate, analyze, synthesize, and integrate concepts and to problem solve in a timely fashion.
- Possess the emotional health and psychological stability required for full utilization of his/her intellectual abilities, exercise good judgement, prompt completion of all responsibilities and the development of mature, sensitive and effective relationships with patients and other members of the health care team.
- Adapt to changing environments and function effectively under stress.
- Students must be able to demonstrate proficiency of all ACGC Practice Based Competencies.

ACGC Practice Based Competencies are available in the UAB GCP Student Handbook and online at http://www.gceducation.org .

Contact Information

For detailed information, contact Program Director, Graduate Program in Genetic Counseling, UAB School of Health Professions, 1716 9th Avenue South, SHPB 444, Birmingham, AL 35294-1212.
Telephone 205-975-4CDS (205-975-4237)
E-mail AskCDS@uab.edu
Website www.uab.edu/msgc

Master of Science in Genetic Counseling

Requirements		Hours
CDS 505	Professional Skills Development	1
CDS 605	Survival Spanish for Health Professionals	1
CDS 610	Research Design and Statistics	3
ANSC 656	Human Embryology	2
ECG 621	Theories of Individual Counseling	3
ECG 638	Practicum I: Clinical Skills and Techniques	3
GC 501	Genetics in Medicine	3
GC 504	Prenatal Genetics, Embryology and Teratology	3
GC 505	Principles of Cancer and Adult Genetics and Counseling	3
GC 506	Theory and Practice of Genetic Counseling	3
GC 510	Introduction to Genetic Counseling	3
GC 600	Advanced Clinical Skills in Genetic Counseling - SL	2
GC 602	Advanced Topics in Genetic Counseling	2
GC 650	Clinical Laboratory Rotation	2
GC 651	Clinical Rotation I	4
GC 652	Clinical Rotation II	2
GC 653	Clinical Rotation III	2
GC 654	Clinical Rotation IV	2
GC 655	Clinical Rotation V	2
GC 725	Advanced Medical Genetics and Genomics	3
Non-Thesis Research (take three times)		**4**
GC 698	Non Thesis Research	
Four hours of Journal Club		**4**
GC 560	Genetic Counseling Journal Club (take four times)	
Total Hours		**57**

Courses

GC 501. Genetics in Medicine. 3 Hours.
Overview of the clinical evaluation and assessment of an individual with a congenital anomaly, intellectual disability and/or genetic condition; includes introduction to etiology of common genetic conditions, pediatric genetic counseling, and testing and treatment options for genetic disorders.

GC 504. Prenatal Genetics, Embryology and Teratology. 3 Hours.
Basic concepts of embryology, teratology and physiology as related to human development and genetic disease and their applications in prenatal genetic counseling.

GC 505. Principles of Cancer and Adult Genetics and Counseling. 3 Hours.
Genetic mechanisms of cancer syndromes, cancer predisposition, and adult onset disorders; psychosocial issues related to these conditions that influence the genetic counseling process.

GC 506. Theory and Practice of Genetic Counseling. 3 Hours.
Development of advanced genetic counseling skills for application in clinical settings.

GC 510. Introduction to Genetic Counseling. 3 Hours.
Introduction to the field of genetic counseling and the basic principles of the profession.

GC 535. Medical Genetics Across the Lifespan. 1 Hour.
Applications in patient care of medical genetics and genomics; genetic family and medical history collection; indications for referral to medical genetics; appropriate use and interpretation of genetic testing; ethical issues in medical genetics.

GC 545. Genetics and Genomics Applications in Health Care. 2 Hours.
Introduction for non-clinicians to the basic principles of medical genetics and the applications of genetics and genomics in healthcare.

GC 560. Genetic Counseling Journal Club. 1 Hour.
Review, presentation and discussion of relevant literature in medical genetics and genetic counseling.

GC 575. Special Topics in Genetic Counseling. 1-4 Hour.
Exploration of current issues in Genetic Counseling.

GC 600. Advanced Clinical Skills in Genetic Counseling - SL. 2 Hours.
Advanced genetic counseling clinical skills utilized in reflective practice, industry, and psychosocial counseling. Students will have opportunities to understand and participate in the lived experiences of people with disabilities through clinical and non-clinical professional duties as a genetic counselor. Attention will be placed on personal and group reflection of these experiences, including service learning and simulations.

GC 602. Advanced Topics in Genetic Counseling. 2 Hours.
Exploration of advanced topics in genetic counseling related to clinical practice and non-clinical professional duties as a genetic counselor.

GC 650. Clinical Laboratory Rotation. 2 Hours.
Exposure to genetic testing protocols, laboratory genetic counseling, and specimen processing and reporting through rotation in biochemical, molecular, and cytogenetic laboratories.

GC 651. Clinical Rotation I. 4 Hours.
Initial clinical rotation to establish basic skill sets in genetic counseling. Supervised and direct patient contact in prenatal, pediatric, adult, cancer, and specialty clinics will allow students to acquire cases for American Board of Genetic Counseling (ABGC) certification.

GC 652. Clinical Rotation II. 2 Hours.
Students utilize intermediate clinical skills in assigned clinical setting. Students interact with an array of genetic specialists. Supervised and direct patient contact in prenatal, pediatric, adult, cancer and specialty clinics will allow students to acquire cases for ABGC certification.

GC 653. Clinical Rotation III. 2 Hours.
Students will apply progressive genetic counseling skills in a clinical setting. Students will interact with an array of genetic specialists. Supervised and direct patient contact in prenatal, pediatric, adult, cancer and specialty clinics will allow students to acquire cases for ABGC certification.

GC 654. Clinical Rotation IV. 2 Hours.
Students will apply progressive genetic counseling skills in a clinical setting. Students will interact with an array of genetic specialists. Supervised and direct patient contact in prenatal, pediatric, adult, cancer and specialty clinics will allow students to acquire cases for ABGC certification.

GC 655. Clinical Rotation V. 2 Hours.
Students will apply progressive genetic counseling skills in a clinical setting. Students will interact with an array of genetic specialists. Supervised and direct patient contact in prenatal, pediatric, adult, cancer and specialty clinics will allow students to acquire cases for ABGC certification.

GC 698. Non Thesis Research. 1-3 Hour.
Graduate level research project under the supervision of clinical faculty.

GC 725. Advanced Medical Genetics and Genomics. 3 Hours.
Medical application of advances in genetics and genomics; chromosome structure and function and major types of chromosomal abnormalities, cancer genetics and cytogenetics; current strategies for detection of mutations associated with genetic disorders, genetic risk assessment and population genetics; genomic approaches to diagnosis and risk stratification.

Health Physics

Health Physics

Degree Offered:	M.S.
Program Director:	Emily Caffrey, PhD, CHP
Phone:	(205) 975-4237
E-Mail:	emilycaf@uab.edu
Website:	www.uab.edu/shp/cds

Program Information

Health physics is the science of radiation protection. This interdisciplinary field combines physics, biology, chemistry, and radiological science to improve human lives. The UAB program offers unique didactic coursework, an applied internship, and the option to complete either a capstone project or a master's thesis.

Admission Requirements

In addition to the general Graduate School admission requirements, applicants to the M.S. program must:

- Have a baccalaureate degree in biology, physics, chemistry, biomedical sciences, bioengineering, or a related degree from an accredited college or university,
- Have a minimum undergraduate GPA of 3.0 (A= 4.0), computed from all undergraduate credits or from the last 60 semester hours of undergraduate course credit,
- Apply for admission to the UAB MHP Program,
- International students from non-English speaking countries are required to submit English proficiency scores (TOEFL/IELTS/ PTEA/Duolingo) that meet the Graduate School's minimum score requirements: TOEFL - 80; IELTS - 6.5; PTEA:- 53; IELA - 176 - Duolingo - 120. See other international admission requirements at https://www.uab.edu/graduate/admissions/international-applicants.

The completed application must be on file with the program office by March 1st for a priority interview to be granted. All eligible applicants will be interviewed in March for admission decisions in early April. Eligible late applicants will be considered on a space-available basis up to August 1st.

If accepted, students must complete the UAB medical history questionnaire and physical, provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service before enrollment. A background check and drug screen will be required at program admission and prior to clinical placement. Persons with a baccalaureate degree may be eligible to register for courses as non-degree seeking graduate students before acceptance into the M.S. program. If a non-degree seeking graduate student meets the M.S. program admission requirements, up to 12 semester hours of approved non-degree graduate coursework may be accepted for the M.S. degree. Admission of a student to any course as a non-degree student does not constitute admission to the M.S. degree program.

Early Acceptance

Early Acceptance Programs are designed for academically superior high-school students. Early Acceptance Programs allow high achieving students to be admitted to the Health Physics program at the same time they are admitted to an undergraduate program.

Eligible students are required to maintain a 3.5 undergraduate GPA.

Fast Track

Students majoring in Biomedical Sciences may apply for a fast-track program. This fast-track is designed for qualified Biomedical Sciences undergraduate students to matriculated into the masters in Health Physics program after receiving the baccalaureate degree. Students will learn how to apply the science, anatomy, and mathematics knowledge from the Biomedical Sciences program to the unique and high-demand field of Health Physics. Successful students will obtain a Bachelor of Science degree in Biomedical Sciences and a Master of Science in Health Physics in five years rather than the traditional six years. For more information contact Lauren Hanhauser at leh@uab.edu or 205-996-0867.

Program Accreditation and Professional Credentials

Established Health Physics programs may seek accreditation from the Applied Science Accreditation Commission (ASAC) of the Accreditation Board for Engineering and Technology (ABET). Programmatic accreditation can be sought when the program is fully implemented and has graduated its first cohort of students. Program graduates will be eligible for part I of the certification examination administered by the American Board of Health Physics (ABHP).

Additional Information

Entry Term:	Fall Semester
Deadline for Application Materials to be in the Graduate School Office:	First Consideration: March 1st; Space available basis after first consideration, up to August 1
Entrance Tests:	For international applicants from non-English speaking countries, minimum score requirements: TOEFL - 80; IELTS - 6.5; PTEA:-53; IELA - 176 - Duolingo - 120.

Contact Information

For detailed information, contact the Department of Clinical and Diagnostic Sciences, Health Physics Program, UAB School of Health Professions, SHPB 446, 1716 9th Avenue South, Birmingham, Alabama 35294-1212.
Telephone 205-934-3209.
E-mail AskCDS@uab.edu

Master of Science in Health Physics

Requirements		Hours
1st Fall Semester (11 hours)		
CDS 505	Professional Skills Development	1
MHP 602	Radiation Physics	3
MHP 610	Radiation Detection and Measurement	4
MHP 650	Health Physics Research Methods	
1st Spring Semester (11 hours)		
MHP 620	Principles of Dosimetry	3
MHP 621	Nonionizing Radiation	3
or elective coursework		
MHP 653	Research Methodology and Publication Analysis	2
MHP 645	Radiation Shielding and Protection	3
1st Summer Semester (15 hours)		
MHP 651	Advanced Radiation Biology	3
MHP 657	Monte Carlo Techniques for Health Physicists	1
MHP 691	Supervised Practice	6
MHP 698	Non-Thesis Research	5
or MHP 699	Thesis Research for MHP	
2nd Fall Semester (15 hours)		
MHP 611	Physics of Diagnostic Imaging	3
MHP 655	Contemporary Issues in Health Physics and CHP Exam Review	3
MHP 654	Laser Safety and Protection	3
MHP 691	Supervised Practice	6
Total Hours		**49**

Courses

MHP 601. Principles of Health Physics. 3 Hours.
Introduction to the practice of health physics. Topics include accelerator and cyclotron health physics, environmental radiation, emergency response, decommissioning and decontamination, and nuclear reactors.

MHP 602. Radiation Physics. 3 Hours.
Introduction to the practice of health physics and an introduction to fundamental nuclear physics concepts. Emphasis is placed upon radioactive decay and the interaction of radiation with matter. Topics in support of this include relativistic dynamics, basic quantum mechanics, nuclear reactions, cross sections, basic atomic structure, fission and fusion.

MHP 610. Radiation Detection and Measurement. 4 Hours.
Principles and mechanisms underlying nuclear radiation detection and measurements; operation of nuclear electronic laboratory instrumentation; application of laboratory detectors for measurement of alpha, beta, and gamma radiation; digital spectroscopy; experimental investigation of interactions of radiation with matter.

MHP 611. Physics of Diagnostic Imaging. 3 Hours.
Overview of the various imaging modalities used in a clinical setting. Topics include the basics of X-rays, ultrasound, CT, MRI, SPECT & PET imaging.
Prerequisites: NMT 620 [Min Grade: C]

MHP 620. Principles of Dosimetry. 3 Hours.
Fundamental principles of radiation dosimetry. Topics include the mathematical treatment of internal and external doses from radiation sources, dosimetry models, routes of intake, industrial and medical sources.
Prerequisites: MHP 601 [Min Grade: C]

MHP 621. Nonionizing Radiation. 3 Hours.
Recognition, assessment, and control of nonionizing radiation hazards. Topics include sound, electricity, magnetism, microwaves, visible light, ultraviolet radiation, and lasers.
Prerequisites: MHP 611 [Min Grade: C] and NMT 610 [Min Grade: C]

MHP 645. Radiation Shielding and Protection. 3 Hours.
Principles of shielding from various types of radiation sources; scenario of radiation exposure and properties of various shielding materials; approaches to radiation protection.

MHP 650. Health Physics Research Methods. 3 Hours.
Introduction to research design and basic statistics as applied in health physics practice and scholarship; overview of the research process, literature reviews, developing research hypotheses; statistical methods for health physicists.

MHP 651. Advanced Radiation Biology. 3 Hours.
Effects of radiation at the molecular, cellular and whole-tissue level. Topics include cell survival curves, repair of radiation damage, radiation carcinogenesis, risk assessment models, cancer biology, model tumor systems, and dose fractionation in radiotherapy.
Prerequisites: NMT 641 [Min Grade: C]

MHP 652. Radiochemistry. 3 Hours.
Overview of fundamentals of radiochemistry and experiments including counting statistics, radionuclide generator design, elution and operation, labeling and quality control, liquid scintillation counting, radiotracer techniques and applications, and dating techniques.
Prerequisites: MHP 611 [Min Grade: C] and NMT 610 [Min Grade: C]

MHP 653. Research Methodology and Publication Analysis. 2 Hours.
Perform scientific research, critically evaluate scientific literature, and write an abstract and scientific poster on a topic relevant to health physics.

MHP 654. Laser Safety and Protection. 3 Hours.
Principles of laser, types of lasers, interaction of lasers with the human body, and laser safety regulations.
Prerequisites: MA 125 [Min Grade: C]

MHP 655. Contemporary Issues in Health Physics and CHP Exam Review. 3 Hours.
Exploration of contemporary issues in health physics; in-depth curriculum review to prepare for CHP exam.

MHP 657. Monte Carlo Techniques for Health Physicists. 1 Hour.
Introduction to Monte Carlo techniques that are regularly used by health physicists.

MHP 675. Special Topics in Health Physics. 1-4 Hour.
Exploration of current issues in Health Physics.

MHP 691. Supervised Practice. 1-10 Hour.
Supervised practice experiences in applied health physics.
Prerequisites: MHP 620 [Min Grade: C]

MHP 698. Non-Thesis Research. 1-6 Hour.
Directed research with a faculty mentor to complete an applied master's degree project.

MHP 699. Thesis Research for MHP. 1-6 Hour.
Original research in health physics and interpretation of results. Demonstrates student's acquaintance with literature of field and competency in proper selection and execution of research methodology.
Prerequisites: GAC M

Physician Assistant Studies

Degree Offered:	M.S.P.A.S.
Program Director:	M. Tosi Gilford, MD, PA-C
Phone:	(205) 936-9921
E-mail:	AskCDS@uab.edu
Website:	www.uab.edu/pa

General Information

Physician Assistants (PAs) are valuable members of a multidisciplinary healthcare team. The profession was established in 1965 to help physicians provide healthcare services to under-served and rural populations. While the profession remains committed to its historical mission, PAs are now employed in almost all medical and surgical specialties.

PAs are healthcare professionals licensed to practice medicine under the supervision of a physician. Individual state practice laws and hospital bylaws define the scope of practice and prescribing authority of physician assistants. To be eligible for licensure, PAs must graduate from an accredited physician assistant program and pass the Physician Assistant National Certification Examination (PANCE). To maintain licensure, PAs must complete 100 hours of continuing medical education credits every two years and pass the Physician Assistant National Recertification Examination (PANRE) every ten years. PAs may obtain additional training through postgraduate residency programs in various subspecialty areas, but these programs are not required for licensure or practice in subspecialty areas.

Admission Prerequisite Coursework and Application Information

All prerequisite courses must be successfully completed in the United States.

Requirements		Hours
BY 115	Human Anatomy	4
BY 116	Introductory Human Physiology	4
or BY 409	Principles of Human Physiology	
BY 123	Introductory Biology I	4
BY 124	Introductory Biology II	4
BY 261	Introduction to Microbiology	4
or BY 271	Biology of Microorganisms	
CH 115 & CH 116 & CH 117 & CH 118	General Chemistry I and General Chemistry I Laboratory and General Chemistry II and General Chemistry II Laboratory (CH 105, CH 106, CH 107, CH 108 accepted)	8
PY 216 & 216L	Elementary Statistical Methods and Elementary Statistical Methods Laboratory	3-4
or MA 180	Introduction to Statistics	
or HCM 360	Statistics for Managers	
PY 101	Introduction to Psychology	3
or PY 201	Honors Introduction to Psychology	
PY 212	Developmental Psychology	3
or PY 218	Psychopathology	
Medical Terminology		3
HCM 350	Medical Terminology for Health Professionals	

Deadline for All Application Materials to be received by the CASPA:	Completed applications must be received by the Central Application Service for Physician Assistants (CASPA) no later than August 1 the year prior to the expected term of enrollment
Number of Evaluations/ Letter of Recommendations Required:	Three
Entrance Tests:	GRE (TOEFL is required for international applicants whose native language is not English).

Accreditation:

The Physician Assistant Studies Program is accredited by the Accreditation Review Commission on Education for the Physician Assistant, Inc. (ARC-PA).

Credentials Conferred:

Diploma – The Master of Science in Physician Assistant Studies (MSPAS) degree is awarded by the University of Alabama at Birmingham.

Professional Certification:

Graduates of the UAB PA program are eligible to take the Physician Assistant National Certifying Examination (PANCE) sponsored by the National Commission on Certification of Physician Assistants (NCCPA) to become a certified PA.

Essential Requirements

Fundamental tasks, behaviors, and abilities necessary to successfully complete the academic and clinical requirements of the program and to satisfy licensure/certification requirements have been outlined and are available upon request from the academic program office. Students requesting disability accommodations should contact UAB Disability Support Services (DSS) at 205-934-4205.

Program Curriculum:

Course requirements are listed below with semester credit hours shown.

Didactic Curriculum

First Year	
First Term	**Hours**
PA 601	4
PA 602	4
PA 605	4
PA 610	3
PA 615	1
CDS 505	1
GC 535	1
	18

Total credit hours: 18

First Year	
Second Term	**Hours**
PA 603	3
PA 606	6
PA 608	3
PA 611	3
PA 616	1
	16

Total credit hours: 16

First Year	
Summer Term	**Hours**
PA 604	3
PA 607	6
PA 609	3
PA 613	3
PA 618	1
PA 619	2
	18

Total credit hours: 18

Second Year	
First Term	**Hours**
PA 614	2
PA 617	3
PA 620	2
PA 633	2
PA 634	2
PA 635	2
	13

Total credit hours: 13

Clinical Curriculum

The clinical component of the curriculum consists of 11 clinical rotations PA 621 – PA 632 plus Senior Seminar and a Master's Research Project Presentation. Of the clinical rotations, 7 are required core rotations and 4 are electives.

Second Year	
Second Term	**Hours**
PA 621	4
PA 622	4
PA 623	4
PA 624	4
PA 643	1
	17

Total credit hours: 17

Second Year	
Summer Term	**Hours**
PA 625	4
PA 626	4
PA 627	4
PA 629	4
PA 644	1
PA 698	1
	18

Total credit hours: 18

Third Year	
First Term	**Hours**
PA 630	4
PA 631	4
PA 632	4
PA 645	3
	15

Total credit hours: 15

Clinical Rotations (PA 621- PA 632)

7 Required Core Clinical Rotations

4 Elective Clinical Rotations:

Requirements		Hours
PA 621	Clinical Service I	4
PA 622	Clinical Service II	4
PA 623	Clinical Service III	4
PA 624	Clinical Service IV	4
PA 625	Clinical Service V	4
PA 626	Clinical Service VI	4
PA 627	Clinical Service VII	4
PA 629	Clinical Service IX	4
PA 630	Clinical Service X	4
PA 631	Clinical Service XI	4
PA 632	Clinical Services XII	4

Master of Science in Physician Assistant Studies-Master of Public Health Degree Option

The coordinated Master of Science in Physician Assistant Studies and Master of Public Health (MSPAS-MPH) dual degree program will prepare physician assistant students for leadership roles that address community healthcare needs. The program aims to increase the number of high quality primary care clinicians with public health expertise and thus improve access, quality and cost of care. This plan of study provides students with a thorough understanding of the social and environmental determinants of health, population disease prevention and health promotion strategies, health disparities, epidemiological research analysis and healthcare quality improvement capabilities.

Admissions Requirements

Students must meet the admissions requirements for both the MSPAS degree program as well as the MPH degree program. Click here for MSPAS admissions requirements. Click here for UAB School of Public Health admissions requirements.
In addition to meeting the stated requirements for each degree separately, applicants for the dual degree must also have completed a bachelor's degree and all prerequisites before December 30 in order to start the program in January of the following spring term.

Application Procedures

In order to be considered for admission to the UAB MSPAS/MPH dual degree program, candidates will need to complete and submit the following materials by the stated deadlines:

August 1: The Central Application Service for Physician Assistants (CASPA) Application
August 7: The UAB PA Supplemental Application
August 7: The UAB Graduate School MPH/MSPAS Application

For more information visit the Physician Assistant Studies web page for the MSPAS-MPH degree option at http://www.uab.edu/shp/cds/physician-assistant/mspas-mph

Master of Science in Physician Assistant Studies

Requirements		Hours
PA 601	Human Gross Anatomy	4
PA 602	Medical Physiology	4
PA 603	Pharmacology I	3
PA 604	Pharmacology II	3
PA 605	Clinical Pathology	4
PA 606	Clinical Medicine I	6
PA 607	Clinical Medicine II	6
PA 608	Surgical Disease I	3
PA 609	Surgical Disease II	3
PA 610	Clinical Lab Medicine	3
PA 611	History and Physical Examination I	3
PA 613	Surgical Techniques	3
PA 614	Operating Room Techniques	2
PA 615	Intro to the Profession	1
PA 616	Electrocardiography	1
PA 617	Applied Behavioral Medicine	3
PA 618	Risk Management	1
PA 619	Fundamentals of Clinical Research	2
PA 620	Analysis of Professional Literature	2
PA 633	Navigating Healthcare Delivery and Reimbursement Systems for Physician Assistants	2
PA 634	Simulated Clinical Concepts	2
PA 635	Special Populations in Medicine	2
CDS 505	Professional Skills Development	1
GC 535	Medical Genetics Across the Lifespan	1
Clinical Service		
PA 621	Clinical Service I	4
PA 622	Clinical Service II	4
PA 623	Clinical Service III	4
PA 624	Clinical Service IV	4
PA 625	Clinical Service V	4
PA 626	Clinical Service VI	4
PA 627	Clinical Service VII	4
PA 629	Clinical Service IX	4
PA 630	Clinical Service X	4
PA 631	Clinical Service XI	4
PA 632	Clinical Services XII	4
PA 643	Senior Seminar I	1
PA 644	Senior Seminar II	1
PA 645	Senior Seminar III	3
PA 698	Presentation of Res Project	1
Total Hours		**115**

Courses

PA 550. Introduction to Medical History Taking and Physical Examination. 3 Hours.
Introduction to the proper way to elicit a comprehensive medical history, perform a physical examination, and report the findings in a systematic and concise format.

PA 601. Human Gross Anatomy. 4 Hours.
Course provides a comprehensive survey of the gross anatomy of the human along with functional and applied anatomy as it relates to common clinical findings. It utilizes a lecture format and cadaver dissection laboratory sessions.

PA 602. Medical Physiology. 4 Hours.
Course emphasizes the normal function and control of various systems within the human body. The principles taught will serve as a foundation for understanding the etiology, management and prevention of disease processes.

PA 603. Pharmacology I. 3 Hours.
Course provides students with the pharmacologic knowledge needed to begin practice as primary care physician assistants. Delivery is via classroom lecture and supplemented with intermittent case studies requiring students to critically evaluate medical conditions and choose safe and effective medications in treating those conditions.

PA 604. Pharmacology II. 3 Hours.
Second and final course in a series that provides students with the pharmacologic knowledge needed to begin practice as primary care physician assistants. Delivered via classroom lecture and supplemented with intermittent case studies requiring students to critically evaluate medical conditions and choose safe and effective medications in treating those conditions.
Prerequisites: PA 603 [Min Grade: C]

PA 605. Clinical Pathology. 4 Hours.
Descriptions of the pathologic processes involved in common disorders and diseases; introduction to the principles of clinical medicine and clinical problem solving; and provide foundation needed for clinical courses taught later in the curriculum.

PA 606. Clinical Medicine I. 6 Hours.
Introductory course in human disease designed to describe the pathologic processes involved in common disorders and diseases; introduces students to the principles of clinical medicine and clinical problem solving; provides background needed for medical courses taught later in the curriculum.
Prerequisites: PA 601 [Min Grade: C] and PA 602 [Min Grade: C] and PA 605 [Min Grade: C] and PA 610 [Min Grade: C]

PA 607. Clinical Medicine II. 6 Hours.
Overview of the diagnosis and management of the most common clinical problems seen by primary care practitioners; employs an organ systems approach incorporating relevant anatomy, physiology, pharmacology, pathology, radiology and nutrition.
Prerequisites: PA 606 [Min Grade: C]

PA 608. Surgical Disease I. 3 Hours.
Course introduces students to common surgical disorders with early emphasis on physiologic changes, medical requirements and evaluation of patients before, during, and after surgery. It also provides basic instruction in the diagnosis, management, and complications associated with common surgical gastrointestinal and urogenital disorders.
Prerequisites: PA 601 [Min Grade: C]

PA 609. Surgical Disease II. 3 Hours.
Course delivered via didactic instruction and focuses on the pre-operative evaluation and diagnosis, and post-operative management and treatment of common disorders of the heart, lungs, and vascular systems.
Prerequisites: PA 608 [Min Grade: C]

PA 610. Clinical Lab Medicine. 3 Hours.
An introduction to laboratory diagnostics with an emphasis on pathology, microbiology, hematology, and clinical chemistry. Course utilizes lecture format, specimen handling in a clinical laboratory as well as cost effective diagnostic algorithms in problem-based case scenarios.

PA 610L. Clinical Laboratory Medicine Lab. 0 Hours.
Lab for PA 610 Clinical Laboratory Medicine.

PA 611. History and Physical Examination I. 3 Hours.
First course in a series of two that provides students with the skills necessary to elicit a comprehensive medical history, perform a complete physical examination and systematically report thier findings. A variety of teaching formats are utilized including: lectures, small group activities, video productions, and simulated patients.

PA 611L. History and Physical Examination I Lab. 0 Hours.
Laboratory required for PA 611 History and Physical Examination I.

PA 613. Surgical Techniques. 3 Hours.
Provides didactic instruction and appliad technical skills in surgical techniques and various invasive medical procedures. An animal sugery laboratory, using live pigs is an essential component.
Prerequisites: PA 601 [Min Grade: C]

PA 614. Operating Room Techniques. 2 Hours.
Final course in a series providing didactic instruction and applied technical skills in surgical techniques and various invasive medical procedures. Experiences in operating rooms in Birmingham area hospitals observing the basics in surgical first assisting.
Prerequisites: PA 613 [Min Grade: C]

PA 615. Intro to the Profession. 1 Hour.
Course is designed to introduce students to the Physician Assistant profession and to prepare them to practice as professionals in a physician/PA/patient team. It will cover roles and responsibilities of thePA including their expected legal and moral behavior, their understanding of laws governing their practice and their ethical responsibilities in being health care professionals. The course will also teach students to respect the health, safety, welfare, and dignity of all human beings and to assess their own personal capabilities and limitations, striving always to improve thier medical practice.

PA 616. Electrocardiography. 1 Hour.
Course presents the basic concepts needed to interpret the electrocardiogram and will provide opportunities to develop interpretive skills through analysis of rhythm strips and 12-lead electrocardiograms. Upon completeion of the course, students will be able to systematically interpret basic rhythm strips and 12-lead electrocardiograms.

PA 617. Applied Behavioral Medicine. 3 Hours.
Course introduces students to human behavior, strategies and issues surrounding health education and theoretical models of how to change human behavior. This knowledge will enable students to incorporate health promotion and disease prevention strategies in their daily clinical practice to the benefit of their patients.

PA 618. Risk Management. 1 Hour.
Course provides an introduction to the legal, political and professional issues affecting physician assistant practice.

PA 619. Fundamentals of Clinical Research. 2 Hours.
Foundations of epidemiologic measures, reasons for patterns of disease occurrence, principles of medical surveillance, methods for investigating disease outbreaks, and principles of diagnostic tests. Review of study designs, roles of variability and bias in the interpretation of scientific literature, and principles of clinical decision-making based on medical literature.

PA 620. Analysis of Professional Literature. 2 Hours.
This course is designed to prepare students to critically evaluate medical literature and use as basia for making medical decisions.

PA 621. Clinical Service I. 4 Hours.
Supervised clinical practice experience in an assigned healthcare organization.

PA 622. Clinical Service II. 4 Hours.
Supervised clinical practice experience in an assigned healthcare organization.

PA 623. Clinical Service III. 4 Hours.
Supervised clinical practice experience in an assigned healthcare organization.

PA 624. Clinical Service IV. 4 Hours.
Supervised clinical practice experience in an assigned healthcare organization.

PA 625. Clinical Service V. 4 Hours.
Supervised clinical practice experience in an assigned healthcare organization.

PA 626. Clinical Service VI. 4 Hours.
Supervised clinical practice experience in an assigned healthcare organization.

PA 627. Clinical Service VII. 4 Hours.
Supervised clinical practice experience in an assigned healthcare organization.

PA 629. Clinical Service IX. 4 Hours.
Supervised clinical practice experience in an assigned healthcare organization.

PA 630. Clinical Service X. 4 Hours.
Supervised clinical practice experience in an assigned healthcare organization.

PA 631. Clinical Service XI. 4 Hours.
Supervised clinical practice experience in an assigned healthcare organization.

PA 632. Clinical Services XII. 4 Hours.
Supervised clinical practice experience in an assigned healthcare organization.

PA 633. Navigating Healthcare Delivery and Reimbursement Systems for Physician Assistants. 2 Hours.
Introduction to current structure and financing of the U.S. health care system; current policy issues affecting physician assistant providers; reimbursement for health care services provided by the physician assistant.

PA 634. Simulated Clinical Concepts. 2 Hours.
Laboratory simulated clinical experience to provide supervised practice in clinical skills, practical procedures, teamwork, patient management, and decision making in preparation for the students clinical year.

PA 635. Special Populations in Medicine. 2 Hours.
Exploration of the medical needs, challenges, and health disparities of specific patient groups including geriatrics, LGBTQ, ethnic minorities, and others.

PA 637. Special Topics in Physician Assistant Studies. 1-4 Hour.
Selected advanced topics of current scientific, clinical and professional importance; specific topics designed to meet student need and interest.

PA 643. Senior Seminar I. 1 Hour.
Didactic instruction to prepare students for the Physician Assistant National Certification Exam (PANCE) and reinforce the student's clinical rotation experiences. The course content reflects areas identified as important by the Examination Content Blueprint prepared by the National Commission on Certification of Physician Assistants (NCCPA).

PA 644. Senior Seminar II. 1 Hour.
Continuation of didactic instruction to prepare students for the Physician Assistant National Certification Exam (PANCE) and reinforce the student's clinical rotation experiences. The course content reflects areas identified as important by the Examination Content Blueprint prepared by the National Commission on Certification of Physician Assistants (NCCPA).

PA 645. Senior Seminar III. 3 Hours.
Culminating didactic instruction to prepare students for the Physician Assistant National Certification Exam (PANCE) and reinforce the student's clinical rotation experiences. The course content reflects areas identified as important by the Examination Content Blueprint prepared by the National Commission on Certification of Physician Assistants (NCCPA).

PA 698. Presentation of Res Project. 1 Hour.
Oral and visual presentations and structured discussion of research papers developed in PA 620.
Prerequisites: PA 619 [Min Grade: C] and PA 620 [Min Grade: C]

Health Services Administration

The Department of Health Services Administration includes degree programs at baccalaureate, masters, and doctoral levels, as well as undergraduate minors and a variety of professional education opportunities for health services executives and clinicians. Some programs in the department are the only one of their kind in the state, or first of their kind in the nation. The MSHA Program is ranked #1 in the nation. Degree programs currently available include:

- Administration - Health Services, PhD
  - Health Services Research, MS
  - Applications of Mixed Methods Research, Graduate Certificate
- Health Administration, MSHA
  - Tracks: Residential, Executive, International
  - Healthcare Leadership, Graduate Certificate
- Health Informatics, MSHI
  - Tracks: Data Analytics, User Experience, Artificial Intelligence, Research
  - Clinical Informatics, Graduate Certificate
- Healthcare Leadership, DSc
- Healthcare Quality and Safety, MS and Graduate Certificate
- Healthcare Simulation, MS and Graduate Certificate
- Health Care Management, BS
  - Tracks: Clinical Manager, General Manager
  - Minors: Health Care Management, Health Information Management

Applications of Mixed Methods Research Graduate Certificate

The Graduate Certificate in Applications of Mixed Methods Research is an interdisciplinary certificate program that provides researchers with applied knowledge and skills to plan, design, conduct, evaluate, and report mixed methods research in the context of the research topic of interest.

Credentials Conferred

The Graduate Certificate in Applications of Mixed Methods Research is awarded by the University of Alabama at Birmingham.

Length of Study

The certificate requires 5 courses (15 credit hours), which can be completed in 3 or more semesters.

Program Entrance Date

Fall, Spring, and Summer semesters

Requirements for Admission

Students holding a master's or other post- bachelor's degree and meeting qualifications for admission to the UAB Graduate School.

Certificate

On completion of the required coursework, the student will be awarded a Graduate Certificate in Applications of Mixed Methods Research by the University of Alabama at Birmingham and the student’s name will appear in the commencement bulletin. A transcript of the coursework taken for the certificate will be available.

The curriculum for the certificate is offered online as web-based distance education with select real-time Zoom sessions. The four required mixed methods courses are designed as independent courses and can be taken in any sequence. Each course has a different focus and objectives, and each course covers different aspects and practices of mixed methods research that can be successfully mastered within a separate course. One elective qualitative research course can be selected from the list of recommended courses based on the student's proficiency in qualitative research methods.

APPLICATIONS IN MIXED METHODS RESEARCH CURRICULUM

Requirements		Hours
Required Coursework 12 Hours		
NRM 777	Mixed Methods Research I: Introduction to the Field	3
NRM 778	Mixed Methods Research II: Designing and Conducting a Mixed Methods Study	3
AH 779	Mixed Methods Applications in Action and Community-Based Participatory Research	3
AH 783	Writing Effective Mixed Methods Grant Proposals	3
Elective Coursework 3 hours (Select 1 Course)		3
NRM 783	Foundations of Qualitative Research	
HPO 628	Qualitative and Mixed Methods Research in Public Health	
AH 785	Qualitative Research: Analysis and Interpretation	
Total Hours		**15**

CONTACT INFORMATION

For detailed information, contact the office for the Graduate Certificate in Applications of Mixed Methods Research, UAB School of Health Professions Building, 1716 9th Avenue South, Birmingham, AL 35294-1212.
Telephone 205-934-3113
Fax 205-975-6608
E-mail mmrgradcert@uab.edu
Web Applications of Mixed Methods Research

Clinical Informatics Graduate Certificate

The Graduate Certificate in Clinical Informatics is an online, self-paced certificate program. All courses will apply toward the Master of Science in Health Informatics degree.

Credentials Conferred

The Graduate Certificate in Clinical Informatics is awarded by the University of Alabama at Birmingham.

Length of Study

The certificate requires 4 courses (15 credit hours), which can be completed in 2 semesters.

Program Entrance Date

Fall Semester

Requirements for Admission

Students holding a master's or other post- bachelor's degree and meeting qualifications for admission to the UAB Graduate School.

Certificate

On completion of the required coursework, the student will be awarded a Graduate Certificate in Clinical Informatics by the University of Alabama at Birmingham and the student’s name will appear in the commencement bulletin. A transcript of the coursework taken for the certificate will be available.

The curriculum for the certificate is offered online only as a self-paced curriculum. The four certificate courses can be completed in two semesters and are only offered during the fall and spring semesters.

CLINICAL INFORMATICS CURRICULUM

Requirements		Hours
HI 611	Introduction to Health Informatics and Healthcare Delivery	4
HI 613	Analysis and Design of Health Information Systems	4
HI 614	Clinical and Administrative Systems	3
HI 617	Principles in Health Informatics	4
Total Hours		**15**

CONTACT INFORMATION
For detailed information, contact the office for the Graduate Certificate in Clinical Informatics, UAB School of Health Professions Building, 1716 9th Avenue South, SHPB 590A, Birmingham, AL 35294-1212.
Telephone 205-975-6608
E-mail mshi@uab.edu (mmrgradcert@uab.edu)

Healthcare Leadership Graduate Certificate

The Graduate Certificate in Healthcare Leadership is a certificate program that provides individuals with applied knowledge and skills to improve their leadership abilities within a healthcare setting.

Credentials Conferred

The Graduate Certificate in Healthcare Leadership is awarded by the University of Alabama at Birmingham.

Length of Study

The certificate requires 5 courses, which can be completed in 3 semesters.

Program Entrance Date

Fall, Spring, and Summer semesters

Requirements for Admission

Admission requirements include eligibility for admission to the UAB Graduate School. Applicants must have a bachelor's degree (or higher) from an accredited college or university or from a recognized university abroad, with a minimum GPA of 3.0 in coursework and a minimum of three years of healthcare industry experience or five years of general industry experience. Additional requirements include submission of a personal statement regarding interest in the certificate program and three letters of recommendation.

Certificate

On completion of the required coursework, the student will be awarded a Graduate Certificate in Healthcare Leadership by the University of Alabama at Birmingham and the student’s name will appear in the commencement bulletin. A transcript of the coursework taken for the certificate will be available.

The curriculum for the certificate is offered online as web-based distance education. The five courses are designed as independent courses and can be taken in any sequence. Each course has a different focus and objectives, and each course covers different aspects of leadership and management.

Requirements		Hours
Required Coursework 16 Hours		
HA 606	Operations Management & Process Improvement in Health Care Organizations	4
HA 610	Health Systems and Policy for Leaders	4
HCS 660	Financial Management for Healthcare Quality Leaders	3
HI 624	Leadership Theory and Development	2
HQS 630	Leadership of High Reliability Healthcare Organizations	3
Total Hours		**16**

CONTACT INFORMATION
For detailed information, contact the office for the Graduate Certificate in Healthcare Leadership, UAB School of Health Professions Building, 1716 9th Avenue South, Birmingham, AL 35294-1212.
Telephone 205-996-2215
E-mail nborkows@uab.edu
Web www.hsa.uab.edu

Healthcare Simulation Graduate Certificate

The Graduate Certificate in Healthcare Simulation meets the growing demand of healthcare simulation educators and leaders. Graduates will be able to design and implement simulations aimed at improving teamwork, communication, and clinical skills according to evidence-based practices.

Our program is delivered online with on-campus visit for 3 1/2 days in September. It is comprised of 15 credits, completed over three consecutive semesters.

Credentials Conferred

The Graduate Certificate in Healthcare Simulation is awarded by the University of Alabama at Birmingham.

Length of Study

The certificate requires 15 credits, which can be completed in 3 semesters.

Program Entrance Date

Fall semester -- deadline for all application materials to be in the Graduate School Office: July 1, after July 1 applications will be considered on a space available basis.

TYPICAL HEALTHCARE SIMULATION CURRICULUM

Requirements		Hours
HCS 575	Introduction to Healthcare Simulation for Quality and Safety	3
HCS 625	Simulation Methodology	3
HCS 626	Healthcare Simulation Laboratory	1
HCS 610	Instructional Design in Simulation	2
HCS 630	Research in Simulation	1
HCS 620	Current Trends in Simulation	2
HCS 635	Advanced Debriefing	3
Total Hours		**15**

Healthcare Quality and Safety Graduate Certificate

The Graduate Certificate in Healthcare Quality and Safety provides participants with tangible skills to reduce patient harm and increase organizational quality. Working professionals apply the knowledge they learn in real time to their unit, department, clinic, hospital, long-term care facility, outpatient care center, or physician office. Through a collaborative environment, learners discover improvement science and quality principles. The certificate prepares individuals to implement quality- and safety- based initiatives in their home institutions, utilizing the concepts of high-reliability leadership, data system design, process management, and hazard analysis.

Credentials Conferred

The Graduate Certificate in Healthcare Quality and Safety is awarded by the University of Alabama at Birmingham.

Length of Study

The certificate requires 4 courses (15 credit hours), which is offered in two formats: blended and online.

Program Entrance Date

Fall and Spring Semester (Blended) and Fall Semester (Online)

Requirements for Admission

Students holding a master's or bachelor's degree and meeting qualifications for admission to the UAB Graduate School.

HEALTHCARE QUALITY AND SAFETY CERTIFICATE CURRICULUM

Requirements		Hours
HQS 600	Introduction to Clinical Quality Improvement	4
HQS 610	Quantitative Methods, Measurement, and Tools for Quality Improvement	4
HQS 625	Fundamentals of Patient Safety	4
HQS 630	Leadership of High Reliability Healthcare Organizations	3
Total Hours		**15**

Administration Health Services

Degrees Offered:	MS in Health Services Research and Ph.D in Administration-Health Services
Director:	Ria Hearld, PhD
Phone:	(205) 934-1670
E-mail:	krbaker@uab.edu
Website:	http://www.uab.edu/shp/hsa/doctoral-programs/ph-d

Master of Science in Health Services Research

The Master of Science in Health Services Research (MSHSR) is a graduate degree that provides advanced training in the development, implementation, and management of health services research projects. The MSHSR is only available to students enrolled in the Administration-Health Services, PhD. program. The coursework focuses on the acquisition and development of research skills to study the delivery of health services.

Admission Requirements

An applicant should be accepted to the Administration-Health Services, PhD. program prior to applying to the Master of Science in Health Services Research degree program. Admission to the MSHSR occurs during the Spring semester and all students must apply through the Graduate School.

Program of Study

The program of study consists of 30 semester hours of coursework.

Requirements		Hours
Regired coursework for the MSHSR Degree		
HA 602	Introduction to Health Care Systems	3
HA 605	Health Policy and Politics in the U.S.	3
AH 701	Administrative Theory	3
AH 705	Health Care Finance	3
AH 710	Comparative Health Systems	3
HA 632	Quantitative Methods in Health Services Admin	3
AH 703	Philosophy of Science	3
AH 707	Research Methods	3
AH 722	Regression Analysis	3
NST 780	Statistical Model II - Topics in Multivariate Analysis	3
Total Hours		**30**

Additional Information

Contact Information

For detailed information, contact the Office of Doctoral Programs in Administration–Health
Services, UAB School of Health Professions Building, 1705 University Boulevard, Birmingham, AL 35294-1212.
Telephone 205-934-3113
Fax 205-975-6608
E-mail phdha@uab.edu
Web www.hsa.uab.edu

Prospective students should visit http://www.uab.edu/shp/hsa/doctoral-programs/ph-d to obtain specific admissions requirements on how to apply.

Doctor of Philosophy Program Information

The Ph.D. program in Administration–Health Services is a degree program offered jointly and cooperatively by the Department of Health Services Administration in the School of Health Professions and the Graduate School of Management in the Collat School of Business. Faculty associated with the School of Public Health, School of Medicine, Lister Hill Center for Health Policy, Center for Outcomes and Effectiveness Research and Education, and Center on Aging also contribute to student learning.

The Ph.D. program is for those who wish to pursue the conceptual, philosophical, and applied aspects of administrative processes in health services, health policy, and outcomes research in health care. It provides doctoral-level study and research in administration with specific application to health services. The pedagogical focus is on developing a strong research orientation through course work, research seminars, and mentoring relationships with faculty. Students who are interested in pursuing academic careers are also afforded the opportunity to develop their teaching skills through course work and teaching opportunities. Job placement occurs in regional, national, and international markets. To date, more than 100 graduates have taken positions in academic institutions as well as health service delivery, governmental, and consulting organizations.

Admission Requirements

An applicant should already possess a master's degree in a relevant discipline or have completed an undergraduate program with an outstanding record. Completed applications of well-qualified candidates received by January 1 may be considered for early admission. The application deadline is March 15. Although applications may be considered after March 15, admission and financial aid priority is given to those applicants whose materials are complete by January 1. Applications submitted after January 1 would be considered on a space-available basis only.

Admission recommendations are made by the Admissions and Policy Committee after examination of the candidate's qualifications. All applicants whose first language is not English are also required to submit a score for the Test of English as a Foreign Language (TOEFL). A TOEFL score of 80 is required if the TOEFL taken is based on the Internet version; if computer-based, the minimum score required is 213; and if the paper-based test version is taken, the minimum acceptable score is 550 or above. Consideration will also be given to the quality of the applicant's academic record, previous research experience and productivity, and estimated research potential as indicated by references.

Various forms of financial aid are available to students. Departmental research assistantships are awarded on a competitive basis and carry an obligation of 20 hours of work per week. Assistantships are awarded to incoming students for a period of one year and may be renewable for a second year based on satisfactory work and academic progress, depending on the availability of funds. Some students are able to secure funding for additional years in the program through research assistant positions or other part-time jobs funded by faculty members' grants and contract activities. Other forms of financial assistance include minority fellowships offered through the UAB Graduate School, paid teaching opportunities in selected undergraduate programs, and federal student loans.

Prerequisites

Prerequisite requirements include one graduate-level statistics course with computer usage, one graduate-level course on the U.S. health care system, and an introductory healthcare finance course. Incoming students who have not met these prerequisites during a master's program may take courses prior to entering the program or during their first year of study in the program.

Program of Study

The program of study consists of five components

1. Courses in administration and health systems,
2. Courses in research methodology and statistics,
3. Specialization courses,
4. Comprehensive examinations,
5. The doctoral dissertation.

Specializations are currently available in strategic management, health services research, and health informatics. Students must complete all coursework in the first three areas and pass a comprehensive examination in each area before work can officially begin on the dissertation. The investigation and other special work leading to the dissertation must be performed directly under the guidance and supervision of a five-person committee of the UAB graduate faculty. The normal minimum period in which the doctoral degree can be earned is three to four years of full-time study.

If entering with a baccalaureate degree, a student is required to earn a minimum of 72 credit hours comprised of the following:

1. Completion of 48 credit hours of course work prior to candidacy

- Up to 16 credits of the 48 can be non-dissertation research credits
- Up to 10 credits can be lab rotation, seminar, or directed study credits

2. Completion of 24 credit hours of research-based work which can be designated as either:

- Completion of at least two semesters in candidacy and accumulation of at least 24 semester credit hours in 799 dissertation research **OR**
- Completion of at least two semesters in candidacy and accumulation of at least 12 semester credit hours in 799 dissertation research **AND**, either during or before candidacy, 12 semester credit hours in other appropriate research-based coursework which has been approved by the graduate student's program

If entering with a previously earned master's degree appropriate to the doctoral degree field, a student is required to earn a minimum of 51 credit hours comprised of the following. These requirements also apply to students with previously earned M.S., D.V.M., D.M.D., D.D.S., etc.:

1. Completion of 27 credit hours of course work prior to candidacy

- Up to 6 credits of the 27 can be non-dissertation research credits
- Up to 6 credits can be lab rotation, seminar, or directed study credits

2. Completion of 24 credit hours of research-based work which can be satisfied by either:

- Completion of at least two semesters in candidacy and accumulation of at least 24 semester credit hours in 799 dissertation research **OR**

- Completion of at least two semesters as a student in candidacy and accumulation of at least 12 semester credit hours in 799 dissertation research **AND**, either during or before candidacy, 12 semester credit hours in other appropriate research-based coursework which has been approved by the graduate student's program.

Typical Program of Study

Requirements		Hours
HA 602	Introduction to Health Care Systems	3
HA 605	Health Policy and Politics in the U.S.	3
HA 632	Quantitative Methods in Health Services Admin	3
AH 700	Health Economics	3
AH 701	Administrative Theory	3
AH 703	Philosophy of Science	3
AH 705	Health Care Finance	3
AH 706	Strategic Management Theory and Research	3
AH 707	Research Methods	3
AH 710	Comparative Health Systems	3
AH 712	Research in Organizational Behavior	3
AH 714	Marketing Strategy and Research	3
AH 715	Research in Organizational Theory	3
AH 720	Continuing Seminar	2
AH 722	Regression Analysis	3
AH 755	Dissemination and Implementation Science in Health Care	3
AH 716	Macroenvironmental Analysis	3
AH 775	Strategic Planning and Management Health Care Organizations	3
AH 780	Strategic Information Systems	3
AH 798	Non-Dissertation Research	1-6
AH 799	Dissertation Research	12
NST 777	Multivariate Statistical Methods For Clinical Nursing Research	3
GRD 717	Principles of Scientific Integrity	3
Specialization Electives*		18

*The specialization electives should be 600+ level and chosen from any of the following departments/schools: Public Health, Sociology, Psychology, Engineering, Education, and Business.

Degree Completion

The granting of the Ph.D. degree is based on completion of all required coursework, residency requirements, comprehensive examinations, dissertation requirements, and the recommendation of the Administration–Health Services graduate program director and the dissertation committee.

Mission, Vision, and Values Statements

Because outstanding teaching and research are essential to the future of health care delivery in our nation and abroad, the Ph.D. program in Administration–Health Services provides doctoral-level training to individuals who will be our future health care leaders in academic and nonacademic research organizations.
We seek to recruit a diverse and talented group of national and international students who are attracted to careers in research and teaching. The educational experience in the Ph.D. program is characterized by exposure to the various disciplines relevant to health administration and policy from across the university, as well as one-on-one mentoring relationships with faculty. These experiences are expected to serve as a foundation for future research throughout the graduate careers.

Additional Information

Deadline for Entry Term(s):	January 1st
Deadline for All Application Materials to be in the Graduate School Office:	March 15th
Number of Evaluation Forms Required:	Three
Entrance Tests:	TOEFL is required for international applicants whose native language is not English
Comments:	Stipend support available

Contact Information

For detailed information, contact the Program Office of the Doctoral Programs in Administration–Health
Services, UAB School of Health Professions Building, 1705 University Boulevard, Birmingham, AL 35294-1212.
Telephone 205-934-3113
Fax 205-975-6608
E-mail phdha@uab.edu
Web www.hsa.uab.edu

Courses

AH 701. Administrative Theory. 3 Hours.
History of, recent contributions to, and current issues in administrative theory and management; focus on evolution of management thought and research and on developing areas of research interest that will contribute to field.

AH 703. Philosophy of Science. 3 Hours.
Systems of thought and activities in theory-building process, deriving hypotheses from literature, understanding scientific theory, philosophy of science; applications to health services administration.

AH 705. Health Care Finance. 3 Hours.
Financial management functions, third-party reimbursement, determination of costs and charges, analysis of financial positions, working capital management, budgeting, capital expenditure analysis, and case studies.

AH 706. Strategic Management Theory and Research. 3 Hours.
Current and historically important research in field of strategic management, including major streams of research, role of strategic management in management disciplines, relationships to other disciplines, and pedagogical approaches used in graduate and undergraduate strategy courses.

AH 707. Research Methods. 3 Hours.
Issues of research design and research methods for organizational studies and health services research; integration of knowledge from quantitative courses with areas of research interest in students' chosen fields.

AH 710. Comparative Health Systems. 3 Hours.
This course allows students to compare the U.S. health care delivery system with approaches used in other countries and to identify health system reform efforts occurring in selected global regions. Emphasis will be placed on the role of the health system within selected forms of government and at various levels of economic development.

AH 712. Research in Organizational Behavior. 3 Hours.
Examination of topics and empirical research in organizational behavior; emphasis on important issues in field, including areas of controversy and contemporary interest.
Prerequisites: AH 706 [Min Grade: C]

AH 715. Research in Organizational Theory. 3 Hours.
Topics and research in organization and management theory applied to health services organizations, including organization-environment relations, population ecology, interorganization relations, and strategic alliances.

AH 716. Macroenvironmental Analysis. 3 Hours.
Examination of research literature that addresses external and internal environmental factors affecting strategic management.
Prerequisites: AH 706 [Min Grade: C]

AH 720. Continuing Seminar. 2 Hours.
Presentations by faculty and Ph.D. candidates concerning issues in particular areas of specialization. May be repeated for credit.

AH 722. Regression Analysis. 3 Hours.
Various approaches to regression analysis, including ordinary least squares and probability models, such as logit and probit.

AH 727. Applied Multivariate Statistic. 3 Hours.
This is a survey course on the application of multivariate techniques in health care management research. The course focuses on application of multivariate statistical methods to health administration research questions, with emphasis on interpretation within real healthcare management problems.

AH 755. Dissemination and Implementation Science in Health Care. 3 Hours.
Historical, scientific, and theoretical underpinnings of dissemination and implementation science; conceptual and methodological challenges of conducting dissemination and implementation science research.

AH 760. Foundations for Health Policy Research and Evaluation. 3 Hours.
Provide historical, theoretical, and analytical foundations to conduct research in health policy.

AH 770. Special Topics in Administration - Health Services. 1-4 Hour.
Exploration of current issues in Administration - Health Services.

AH 775. Strategic Planning and Management Health Care Organizations. 3 Hours.
Assessment of strategic management literature applied to health services organizations, exploration of strategy formulation, strategic content, and implementation and evaluation of topics for health care organizations.
Prerequisites: AH 706 [Min Grade: C]

AH 777. Mixed Methods Research I: Introduction. 3 Hours.
Introduction to mixed methods research: essence of mixed methods research, rationale for using it, fundamental principles and key characteristics, major design applications, and means of assessing the quality of mixed methods inferences.

AH 778. Mixed Methods Research II: Designing and Conducting Mix Mthds Study. 3 Hours.
Knowledge and skills of designing and conducting mixed methods studies in social and health sciences: types of research problems addressed, specification of mixed methods purpose statements and research questions, types of mixed methods designs, data collection and analysis strategies within mixed methods designs, procedures for reporting and evaluating mixed methods studies, and visually presenting mixed methods procedures.

AH 779. Mixed Methods Applications in Action and Community-Based Participatory Research. 3 Hours.
Overview of how mixed methods can be applied in designing and conducting community-based action research studies: community-based action research, its purposes and cross-disciplinary utilization; a mixed methods methodological framework for action research; steps in designing and conducting mixed methods action research studies in community settings; specific types of mixed methods action research designs; sampling, data collection, analysis, validation, and evaluation of mixed methods action research projects.

AH 783. Writing Effective Mixed Methods Grant Proposals. 3 Hours.
Logistics of developing competitive mixed methods grant applications for K and R type funding mechanisms; special focus on specific aims, innovation and significance, research plan, human subject protection, project team, resources, and budget; integrating multiple methods and data sources, establishing analytical rigor, and addressing reviewer feedback.

AH 785. Qualitative Research: Analysis and Interpretation. 3 Hours.
Applied knowledge of data analysis and interpretation in qualitative inquiry as related to its five basic approaches (narrative, case study, ethnography, grounded theory, and phenomenology). Students will develop basic skills in using qualitative research software NVivo for data organization, management and analysis.

AH 788. Independent Studies. 3 Hours.

AH 790. Independent Study and Research. 1-12 Hour.
Independent Study and Reserch in Administration Health Services. Can be taken from 1-12 hours graduate credit.

AH 798. Non-Dissertation Research. 1-9 Hour.
Non dissertation research credits. Can be taken for 1 to 9 graduate credits.

AH 799. Dissertation Research. 1-9 Hour.
Dissertation Research. Must be admitted to doctoral candidacy. Must have 2 semesters before graduation.
Prerequisites: GAC Z

Health Administration

Degree Offered:	M.S.H.A.
M.S.H.A. Director (Residential Track):	J'Aime C. Jennings, PhD
M.S.H.A Director (Executive Track):	Steven Howard, PhD
Phone:	(205) 934-1583
E-mail:	Residential jcjennings@uab.edu; Executive showard3@uab.edu
Website:	www.uab.edu/msha

Master of Science in Health Administration Program Information

The Master of Science in Health Administration (MSHA) Program, accredited by the Commission on Accreditation of Healthcare Management Education, trains executives for health services organizations. The program has graduated more than 1,400 persons since 1965.
Students must complete 23 graduate courses and a 12-month administrative residency in a health care organization. A capstone core course is completed during the last on-campus semester. Twenty-one core courses and two elective courses are required as well as a summer internship or international experience for single-degree MSHA students. All students begin in the fall term and complete coursework in 21 months followed by the administrative residency.
Complete applications for fall entry are due no later than the preceding December 1. Since admission to the MSHA program is very competitive, early application is encouraged.

- **Master of Science in Health Administration-Master of Business Administration**
- **Master of Science in Health Administration-Master of Science in Health Informatics**
- **Master of Science in Health Administration-Master of Public Health**

Students wishing to pursue simultaneously the Master of Science in Health Administration (MSHA) and the Master of Business Administration (MBA) degrees must complete 29 graduate courses, including 1 elective. Students seeking to complete the Master of Science in Health Administration (MSHA) and the Master of Science in Health Informatics (MSHI) must complete 30 graduate courses including a summer internship. Students seeking to complete the Master of Science in Health Administration (MSHA) and the Master of Public Health must complete 27 graduate courses, including a summer internship. MSHA-MPH students will complete 13 hours of public health coursework in the summer term prior to MSHA program entry.

A 12-month administrative residency in a health services organization is required for completion of the MSHA degree. A student who enters a coordinated program, but subsequently decides to pursue only one of the degrees, must satisfy all the requirements for the degree sought.

Application Information

Applicants to the MSHA, MSHA-MBA, MSHA-MSHI, or MSHA-MPH programs must have completed or anticipate completion of at least a baccalaureate degree from a regionally accredited college or university or from a recognized university abroad before entry into the program. Application for the MSHA program should be made by visiting the UAB Graduate School website (uab.edu/graduate) and click the ‘Apply Now’ button.

Telephone 205-934-1583
E-mail parmstrong@uab.edu
Web www.uab.edu/msha

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	December 1 for first priority and June 1 if space is still available
Number of Evaluation Forms Required:	Three
Entrance Tests:	TOEFL and TWE are also required for all international applicants whose native language is not English.
Comments:	Additional application for admission is required by program

For detailed information, contact Admissions Coordinator, Department of Health Services Administration, UAB School of Health Professions, SHPB 567, 1716 9th Avenue South, Birmingham, AL 35294.

Telephone 205-934-1583
E-mail parmstrong@uab.edu
Web www.uab.edu/msha

Executive Master of Science in Health Administration Program Information

Qualified students can earn the Master of Science in Health Administration (MSHA) by completing the Executive format. This program is open to individuals with at least 5 years of experience in health care organizations, either as managers or as clinical professionals. Participants in the MSHA program (Executive format) complete both on-campus and distance-learning activities, and a brief field experience, within 2 years of study.

Executive Health Administration and Master of Science in Healthcare Quality and Safety Coordinated Degree

Students wishing to pursue simultaneously the executive format of the Master of Science in Health Administration and the Master of Science in Healthcare Quality and Safety degrees must be accepted into both programs and complete twenty-eight (28) courses, including an interactive capstone experience course. A student who enters a coordinated program, but subsequently decides to pursue only one of the degrees, must satisfy all the requirements of the degree sought.

Healthcare Quality and Safety Certificate for Executive Master of Science in Health Administration

Students enrolled in the Executive Master of Science in Health Administration program, may pursue a graduate certificate in Healthcare Quality and Safety. To obtain the certificate, Executive MSHA students may add an online HQS certificate course in each fall and spring term, increasing their credits hours from 9 to 13. For more information, please contact the HQS or MSHA programs.

Contact Information

For detailed information, contact Admissions Coordinator, Department of Health Services Administration, UAB School of Health Professions, SHPB 564, 1716 9th Avenue South, Birmingham, Alabama 35294.

Telephone 205-996-6593
E-mail hjlee@uab.edu (sarap@uab.edu)
Web www.uab.edu/msha

Graduate Certificate in Healthcare Financial Management

Any student who receives three "C"s or one "F" in any graduate level course while in the MSHA program will be dismissed from the program.

Requirements		Hours
HA 620	Healthcare Financial Management I	3
HA 621	Healthcare Financial Management II	3
HA 623	Application of Health Care Finance Principles	3
HA 624	Revenue Cycle Management	3
or HA 644	Seminar Issues in Ambulatory Care and Medical Group Management	
Select one elective from the list below:		
MBA 621	Topics in Corporate Finance	
MBA 622	Portfolio Theory and Construction	
MBA 624	Global Financial Management	
MBA 629	Treasury Management	
MBA 626	Credit Markets and Instruments	3
Total Hours		**15**

Executive Master of Science in Health Administration

The Executive MSHA Program requires a minimum of 57 semester hours for the MSHA degree. Any student who receives three "C"s or one "F" in any graduate level course while in the MSHA Program will be dismissed from the program.

Requirements		Hours
HA 602	Introduction to Health Care Systems	3
HA 605	Health Policy and Politics in the U.S.	3
HA 612	Essentials of Health and Human Disease	3
HA 607	Operation Management for Health Services	3
HA 613	Health Law	3
HA 614	Process Improvement	3
HA 620	Healthcare Financial Management I	3
HA 621	Healthcare Financial Management II	3
HA 625	Strategic Planning and Management	3
HA 631	Organization Theory and Behavior	3
HA 632	Quantitative Methods in Health Services Admin	3
HA 635	Human Resources Management in Health Services Administration	3
HA 637	Leadership	3
HA 640	Information Systems and Management Science in Health Services Administration	3
HA 645	Health Economics	3
HA 655	Seminar: Synthesis of Health Services Administration	3
HA 671	Health Care Marketing	3
HA 674	Health Care Innovation	3
HA 695	Independent Study	3
Total Hours		**57**

Residential Master of Science in Health Administration

Any student who receives three C's or one F in any graduate level program will be dismissed from the program.

Requirements		Hours
HA 602	Introduction to Health Care Systems	4
HA 605	Health Policy and Politics in the U.S.	3
HA 606	Operations Management & Process Improvement in Health Care Organizations	3-4
HA 612	Essentials of Health and Human Disease	3
HA 613	Health Law	3
HA 620	Healthcare Financial Management I	3
HA 621	Healthcare Financial Management II	3
HA 625	Strategic Planning and Management	3
HA 628	Leadership Development	3
HA 631	Organization Theory and Behavior	3
HA 632	Quantitative Methods in Health Services Admin	3
HA 635	Human Resources Management in Health Services Administration	3
HA 640	Information Systems and Management Science in Health Services Administration	3
HA 671	Health Care Marketing	3
HA 675	Health Administration Internship	3
HA 680	Health Administration Capstone	2
Administrative Residency (take twice)		10
HA 690	Administrative Residency	
HA 645	Health Economics	3
MBA 601	Accounting and Finance for Managers	3
Two Electives [1]		**6**
Total Hours		**70-71**

Dual Master of Science in Health Administration and Master of Science in Health Informatics

Any student who receives three C's or one F in any graduate level course while enrolled in the MSHA program will be dismissed from the program.

Requirements		Hours
HA 602	Introduction to Health Care Systems	4
HA 605	Health Policy and Politics in the U.S.	3
HA 606	Operations Management & Process Improvement in Health Care Organizations	3-4
HA 612	Essentials of Health and Human Disease	3
HA 613	Health Law	3
HA 620	Healthcare Financial Management I	3
HA 621	Healthcare Financial Management II	3
HA 625	Strategic Planning and Management	3
HA 628	Leadership Development	3
HA 631	Organization Theory and Behavior	3
HA 632	Quantitative Methods in Health Services Admin	3
HA 635	Human Resources Management in Health Services Administration	3
HA 671	Health Care Marketing	3
HA 680	Health Administration Capstone	2
Administrative Residency (take twice)		**10**

HA 690	Administrative Residency	
HA 645	Health Economics	3
One Elective [1]		3
Total Hours		**58-59**

Dual Master of Science in Health Administration and Master of Business Administration

Any student who receives three C's or one F in any graduate level course while enrolled in the MSHA program will be dismissed from the program.

Requirements		Hours
HA 602	Introduction to Health Care Systems	4
HA 605	Health Policy and Politics in the U.S.	3
HA 606	Operations Management & Process Improvement in Health Care Organizations	3-4
HA 612	Essentials of Health and Human Disease	3
HA 613	Health Law	3
HA 620	Healthcare Financial Management I	3
HA 621	Healthcare Financial Management II	3
HA 625	Strategic Planning and Management	3
HA 628	Leadership Development	3
HA 631	Organization Theory and Behavior	3
HA 632	Quantitative Methods in Health Services Admin	3
HA 635	Human Resources Management in Health Services Administration	3
HA 671	Health Care Marketing	3
HA 680	Health Administration Capstone	2
Administrative Residency (take twice)		**10**
HA 690	Administrative Residency	
HA 645	Health Economics	3
HA 640	Information Systems and Management Science in Health Services Administration	3
Total Hours		**58-59**

[1] Pre-approved Electives: HA 623, HA 644 , HA 624, HA 675, HCO 620, HI 600, HI 640, HI 650, HI 651, HQS 600, HQS 625, HQS 635, MBA 690

Courses

HA 599. Professional Development. 0 Hours.
Professional development experiences associated with the MSHA degree program.

HA 602. Introduction to Health Care Systems. 3-5 Hours.
U.S. health care system. Historical context; systems theory; analysis of organizational components; health services personnel; national, state, and local government roles; financing mechanisms; demography; mortality and morbidity; quality assurance; political issues; and trends in progress. Individual and group projects and field trips.

HA 605. Health Policy and Politics in the U.S.. 3 Hours.
Policy-making process in U.S. Review of forces influencing policy-making, legislative process, and evolution of U.S. health policy.

HA 606. Operations Management & Process Improvement in Health Care Organizations. 3-4 Hours.
Presents an overview of operational management and processes from the administrative perspective. Provides students with knowledge, skills, and tools including lean/six sigma, to implement, facilitate, and coordinate continuous quality improvement activities in health care environments.

HA 607. Operation Management for Health Services. 3 Hours.
Day-to-day operational aspects of health services administration through use of required readings, case studies, class discussions, and class assignments.
Prerequisites: HA 602 [Min Grade: C]

HA 610. Health Systems and Policy for Leaders. 1-4 Hour.
Overview of the United States health care system in terms of historical, current, political, organizational, human resources, financial, access-related, and quality dimensions; comparisons of the US health system to other health systems; overview of the US health policy, policy-making, and analysis.

HA 612. Essentials of Health and Human Disease. 3 Hours.
Reviews medical terminology, diseases, and diagnostic and therapeutic procedures for key body systems and the fundamentals of epidemiology.

HA 613. Health Law. 3 Hours.
Selected legal principles and their application to health field. Legal aspects of corporate liability, medical malpractice, admission and discharge processes, medical staff bylaws, informed consent, nursing, patients' rights, medical records, and governmental regulation of personnel and health facilities.

HA 614. Process Improvement. 3 Hours.
Customer driven process involving team and process thinking and application of statistical tools to way in which work is accomplished. Provides students with knowledge, skills, and tools necessary to implement, facilitate, and coordinate continuous quality improvement activities in health care environments.

HA 616. Biomedical Ethics. 3 Hours.
Focuses on the examination of various faith traditions, theories, principles and methods that influence reasoning, analysis and argument in contemporary health care ethics. Investigation of notable cases, the application of Modern Moral Theory, and in depth discourse on current issues in health care ethics (including media) is the cornerstone of the course.

HA 620. Healthcare Financial Management I. 3 Hours.
Application of financial management techniques to decision making for health care providers. Financial management functions and organizations, financial statement analysis, working capital management, present value analysis, capital budgeting, cost of capital, variance analysis, financing techniques, and financial analysis case studies.

HA 621. Healthcare Financial Management II. 3 Hours.
Analytical and synthetic aspects of financial management tools. Project method and case studies used to supplement theory.

HA 622. Financial Management for Health Professionals. 3 Hours.
Financial statements, cost allocation, capital budgeting, time value analysis, reimbursement, financial risk and return, long-term debt financing, capital structure, cost of capital, and analysis of financial performance.

HA 623. Application of Health Care Finance Principles. 3 Hours.
This course gives students opportunities to work on finance related projects in a health care setting. It is intended for Master of Science in Health Administration students who are pursuing the Health Care Financial Management Certificate. The students will apply knowledge they have acquired in previous courses in Health Care Financial Management.

HA 624. Revenue Cycle Management. 3 Hours.
The purpose of this course is to expose generalist administrators to information directly related to a modern healthcare revenue cycle and the impact that this process has on the financial viability for all healthcare organizations.

HA 625. Strategic Planning and Management. 3 Hours.
Methods for strategic planning and management of health services organizations. Techniques for determining strategies for unique services, integration of strategy, structure, and administrative systems.

HA 628. Leadership Development. 3 Hours.
Provide tools for the students' professional development and leadership; assist students' research for an administrative residency.

HA 631. Organization Theory and Behavior. 3 Hours.
Introduction to organization theory and behavior with applications to health services organizations. Topics include organizational structure, organization/ environment relationships, organizational performance, power and leadership, perception, attitudes, motivation, communication, and group dynamics.

HA 632. Quantitative Methods in Health Services Admin. 3 Hours.
Selected mathematical, statistical, and computer applications and statistical techniques applied to decision making in hospitals and health care organizations.

HA 635. Human Resources Management in Health Services Administration. 3 Hours.
Human resources management issues, including strategic role of employee selection, appraisal, rewards, and development, applications to health care sector, labor relations, and unique aspects of labor law relevant to health care organizations.

HA 636. High Performing Healthcare Organizations. 3 Hours.
This course is designed for future managers and leaders of hospitals and health systems and those who expect to have extensive involvement in them from the perspective of buyers, insurers, or policy makers. The course provides students with knowledge about how the best hospitals and health systems respond to their environment, and how they reach and implement decisions about future activities.

HA 637. Leadership. 3 Hours.
Individual leadership talents in handling various organizational challenges, such as leading organization change, building strong culture, developing effective teams, resolving conflicts, implementing effective motivational systems, and nurturing a learning organization.

HA 640. Information Systems and Management Science in Health Services Administration. 3 Hours.
Introductory course that provides basic vocabulary and principles of modern information architectures. Computer networking and communication technologies needed to support modern information infrastructures. Emphasis on management and use of information to support management decision making.

HA 643. Long-Term Care Administration. 3 Hours.
Seminar analysis of effect of chronic conditions and aging on delivery of health services, nursing homes and alternatives, mental health facilities and agencies, and rehabilitation facilities and services. Field trips and individual research projects.

HA 644. Seminar Issues in Ambulatory Care and Medical Group Management. 3 Hours.
This course provides an overview to the field of ambulatory care and physician practice management. With the emphasis on outpatient care, these areasoffer tremendous career potential for graduate students. Man aspects are similar between the acute care setting and the ambulatory care environment; however, this course will highlight areas that differ and how those differences impact doing business. This course builds on many of the Masters-level introductory courses.

HA 645. Health Economics. 3 Hours.
Economic analysis applied to health services sector; concept of efficiency applied to production and distribution of health services, health insurance, government programs, health care personnel, and health services organizations; current public policy issues; emphasis on student application of economic principles to health care issues.

HA 650. Management and Leadership Skills for Clinical Professionals. 1-3 Hour.
Leadership concepts and management principles as employed by clinical professionals in health care organizations. Focus on effective approaches to communication, change and conflict management, performance and financial management, and cultural competence.

HA 655. Seminar: Synthesis of Health Services Administration. 3-4 Hours.
Case method and problem-solving applications. Integration of materials presented during previous academic coursework. Course offered via Internet for Executive HA students. 2-3 hours each term of residency.

HA 671. Health Care Marketing. 3 Hours.
Introductory survey of marketing concepts as applied to health services organizations. Consumer behavior, market segmentation, target marketing, marketing research, management, and control of marketing mix variables.

HA 672. Health Care Entrepreneurship. 3 Hours.
This course provides a overview of the principle components of health care entrepreneurship, including business planning, raising funds, and the entrepreneurial activity and promoting innovation in existing healthcare organizations (intrapreneurial ventures).

HA 674. Health Care Innovation. 3 Hours.
Introduction to innovation management concepts, theories of idea generation, methods to select strategically innovative services, service delivery models, and project management concepts.

HA 675. Health Administration Internship. 3 Hours.
Provides an experience for MSHA students to become more familiar with a health care organization or the deliver/administration of health care in a different country; provides an opportunity for students to apply and integrate knowledge and skills; interactions with health care managers and executives in a "real world" health care setting; enables students to explore and clarify their own career goals and to begin the process of professional development.

HA 678. Special Topics in Health Administration. 1-4 Hour.
Exploration of current issues in Health Administration.

HA 680. Health Administration Capstone. 2 Hours.
Helps facilitate the students' transition from the academic learning environment to the "real world".

HA 690. Administrative Residency. 2-6 Hours.
Structured field experience providing mentoring relationship with preceptor, observation of management processes within health services organization, and application of administrative theory and techniques. 2-6 hours each term of residency.

HA 695. Independent Study. 1-6 Hour.

HA 697. Independent Study. 3 Hours.

Health Informatics

Degree Offered:	M.S.H.I.
Program Director:	Sue S. Feldman, RN, MEd, PhD, FACMI
Phone:	(205) 975-0809
E-mail:	mshi@uab.edu
Website:	www.uab.edu/hi

Master of Science in Health Informatics

Program Admission

Admission to the program is in the fall semester only. Application to the program may be made September through May 31, preceding the expected date of enrollment for the next fall term. Applications received after May 31 are considered on a space-available basis. Applications are evaluated against the Graduate School criteria and those criteria developed specifically for the HI program. The ideal size of each entering class is 30 to 35 students.

Admission Requirements

Admission to the program requires acceptance to the Graduate School of The University of Alabama at Birmingham. Applicants must have completed or anticipate completion of at least a baccalaureate degree from a regionally accredited college or university or from a recognized university abroad before entering the program. As a criterion for unconditional admission, applicants must have no less than a B GPA (3.0 on a 4.0 scale) for the last 60 semester hours of earned undergraduate credit or overall undergraduate credit hours. Official transcripts of all previous academic work beyond the secondary level should be submitted. Before matriculation, entering students must have received a final transcript for each degree received.

The applicant should include a carefully drafted statement about his or her personal interests, career goals, and relevant background experience and a professional resume. Three **confidential** letters of recommendation from individuals qualified to write concerning the applicant's potential for success in both a graduate program and in the Health Informatics field must be submitted.

Prior to entering the program, applicants should have completed three credit hours of undergraduate or graduate course work in statistics (taken within the last five years with a grade of B or better) and an SQL programming or a relevant continuing education course.

Admission to the MSHI program is determined by an interview process and the consensus of the Admissions Committee. The decision is based on previous academic record, professional recommendations as evidence of ability to perform graduate-level work, and an interview with two faculty members. The program director reserves the prerogative for final recommendation on admission status to the Graduate School.

Applicants accepted to the program may be asked to complete a criminal background check and drug screen at program admission and again prior to clinical placement as required by school policy.

To be considered for early admission, all application materials must be in the Graduate School Office by March 1.

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	May 31
Number of Evaluation Forms Required:	Three Professional Letters of Recommendation
Entrance Tests:	(TOEFL and TWE also required for international applicants whose native language is not English.)
Length of Study:	45 Credit Hours

Program Overview

Health Informatics is about optimizing technology to effectively capture and manage health information. Health Informatics is a rapidly evolving discipline that connects people, technology, and data to better improve healthcare outcomes. Health Informatics professionals work with the processes and tools used to implement, maintain, and evaluate health informatics systems and applications. The Health Informatics professional is a cross-cutting leader who drives analytics and usability.

Our students graduate with a solid understanding of how clinicians and administrators use data, information, and technology in making decisions. With courses in the effective design and use of information systems, databases and software, students also learn how to successfully manage the flow of information throughout a healthcare organization and the value of building a solid business case for the purchase, implementation, and use of technology in a healthcare setting. Graduates are prepared to become senior and executive level leaders in the healthcare IT industry. Students are exposed to a variety of academic disciplines and gain a broad education that serves as a foundation for them throughout their careers as information and health informatics executives.

The program includes a core curriculum plus one track of the student's choosing. The first year of the MSHI core curriculum includes HI 611 Introduction to Health Informatics and Healthcare Delivery, HI 613 Analysis and Design of Health Information Systems, HI 614 Clinical and Administrative Systems, HI 617 Principles in Health Informatics, HI 618 Research Methods in Health Informatics, HI 619 Databases and Data Modeling, HI 620 Security and Privacy in Health Care, and HI 621 Strategic Planning Project Management and Contracting. During the second year, students complete the MSHI core by taking HI 624 Leadership Theory and Development and completing a capstone project.

Data Analytics Track

The proliferation of information technology to support workers in the healthcare industry has resulted in a massive amount of healthcare data being generated. While the data are seen as an organizational asset that can both help determine trends and patterns in patient care delivery and increase organizational efficiency, there are very few individuals trained to extract, combine, organize, interpret, and display these data in meaningful ways. This track produces graduates who help healthcare organizations institute data-driven decision-making processes through

data science approaches. Beyond that, graduates of this track in the MSHI program are trained to assist organizations with developing data governance strategies, which help them define the way they think about quality, security, access to data, and policies surrounding data.

Courses in the Data Analytics Track include HI 599 Professional Development, HI 641 Healthcare Data Analytics Challenges, Methods, and Tools, HI 642 Advanced Data Management and Analytics for Healthcare, HI 643 Business Intelligence for Healthcare, HI 646 Advanced Quantitative Methods for Health Informatics, HI 671 Data Analytics Capstone Project I, HI 673 Data Analytics Capstone Project II, and HI 675 Data Analytics Capstone Project III.

Entry into this track requires admission to the MSHI program and completion of the first year MSHI core curriculum. Declaration for this track occurs in the summer semester of the student's first year in the program.

User Experience Track

Information technology has facilitated many significant improvements to the way we deliver patient care. However, most IT solutions currently in use by healthcare organizations were not designed to enable new models of healthcare delivery and will require development of more intuitive interfaces that model the behaviors and needs of patients and clinical end users. New products and software cannot be perceived as too difficult to use, nor can they compromise clinicians' ability to interact meaningfully with their patients. Graduates of the Healthcare User Experience Track bring an in-depth understanding of human factors engineering to a complex healthcare delivery system, the technologies that are required to support patient care delivery, and the understanding of best practices in designing safe, effective, and user-friendly products and software in a healthcare setting.

Courses in the User Experience Track include HI 599 Professional Development, HI 656 Human Factors in Healthcare IT Systems, HI 657 Human-centered Research Design Methods for Healthcare, HI 658 Development of User Centered Health Information Systems, HI 659 Qualitative Synthesis for Healthcare Insights, HI 672 User Experience Capstone Project I, HI 674 User Experience Capstone Project II, and HI 676 User Experience Capstone Project III.

Entry into this track requires admission to the MSHI program and completion of the first year MSHI Core. Declaration for this track occurs in the summer semester of the student's first year in the program.

Artificial Intelligence Track

Artificial Intelligence (AI) technology is critical to future-proofing the healthcare system such that approaches are used for anticipating the future and developing methods of minimizing the negative effects while taking advantage of the positive effects. AI is currently being used to improve patient care, provide accurate diagnoses, optimize treatment plans, inform the decisions of health policymakers, and allocate resources within health systems. As AI permeates the spectrum of healthcare, clinicians and healthcare professionals must be equipped to handle the advancements and challenges brought on by AI and machine learning solutions. The AI track produces graduates who have a working knowledge of Artificial Intelligence as applied to a clinical environment and will serve as translators and accelerators of using healthcare AI technologies.

Courses in the Artificial Intelligence Track include HI 599 Professional Development, HCI 611 Foundations of Artificial Intelligence in Medicine, HCI 612 Applications of Artificial Intelligence in Medicine, HCI 614 Integration of Artificial Intelligence into Clinical Workflow, one elective, HI 680 Artificial Intelligence Capstone Project I, HI 681 Artificial Intelligence Capstone Project II, and HI 682 Artificial Intelligence Capstone Project III.

Entry into the track requires admission to the MSHI program and completion of the first year MSHI core curriculum. Declaration for this track occurs in the summer semester of the student's first year in the program.

Research Track

Health informaticians are being called on to participate in and contribute to scientific studies and translate bioinformatics into practice. Additionally, for those who are post-docs, we offer the Research Track in collaboration with the Informatics Institute in the Heersink School of Medicine. This track includes two elective courses.

Courses in the Research Track include: HI 599 Professional Development, INFO 696 Introduction to Biomedical Informatics Research, INFO 697 Biomedical Informatics Methods, two Electives, HI 677 Research Capstone Project I, HI 678 Research Capstone Project II, and HI 679 Research Capstone Project III.

Entry into the track requires admission to the MSHI program and completion of the first year MSHI Core. Declaration for this track occurs in the summer semester of the student's first year in the program. Students must discuss electives with the program director prior to course registration.

Clinical Informatics Graduate Certificate

The Clinical Informatics Graduate Certificate is designed as a high-quality, rigorous educational forum for practicing clinicians interested in advancing their informatics skills. Students will develop a broad understanding of the strategic application of clinical and administrative information systems, the data contained in these systems, and the people and processes required for effective information systems deployment. Expanding the number of clinical professionals who can act as health informatics champions in healthcare organizations is needed to enable high quality health care, improved population health, and efficient use of healthcare resources.

The curriculum is delivered completely online and consists of 15 credit hours (4 courses) that may be completed in two academic terms. Applicants must be admitted to the UAB Graduate School and to the Clinical Informatics Graduate Certificate program. Upon application and admission to the MSHI program, these 15 credits can be applied toward degree requirements for the MSHI degree.

Additional Information

Requirement	Fulfilled By:
Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	May 31
Length of Study:	15 Credit Hours

Contact Information

For detailed information, contact the Program Manager, Graduate Programs in Health Informatics, UAB School of Health Professions,

SHPB 590F. Physical address: 1716 9th Avenue South, Birmingham, AL 35294. Mailing address: 1720 2nd Avenue South, Birmingham, AL 35294
Telephone 205-996-2215
Fax 205-975-6608
E-mail mshi@uab.edu

Graduate Certificate in Clinical Informatics

Requirements		Hours
HI 611	Introduction to Health Informatics and Healthcare Delivery	4
HI 613	Analysis and Design of Health Information Systems	4
HI 614	Clinical and Administrative Systems	3
HI 617	Principles in Health Informatics	4
Total Hours		**15**

Master of Science in Health Informatics

The MSHI Program follows a Core/Track model which consists of a total of 45 semester hours. 28 semester hours are taken in the core Informatics courses. The remaining 17 semester hours are taken in one of three specialty tracks (Healthcare Data Analytics, Healthcare User Experience, or Research).

The MSHI Program allows students to earn only two grades of "C" during their time in the program. Upon earning a third grade of "C," the student may be dismissed from the program, depending on the final GPA. In all cases, if the program GPA is lower than 3.0, the student is placed on academic probation or dismissed from the program. Any final grade of "F" or below in any course will result in dismissal from the program.

Requirements		Hours
HI 599	Professional Development	0
HI 611	Introduction to Health Informatics and Healthcare Delivery	4
HI 613	Analysis and Design of Health Information Systems	4
HI 614	Clinical and Administrative Systems	3
HI 617	Principles in Health Informatics	3
HI 618	Research Methods in Health Informatics	3
HI 619	Databases and Data Modeling	3
HI 620	Security and Privacy in Health Care	3
HI 621	Strategic Planning Project Management and Contracting	3
HI 624	Leadership Theory and Development	2
Total Hours		**28**

Healthcare Data Analytics Track

Requirements		Hours
HI 599	Professional Development	0
HI 641	Healthcare Data Analytics Challenges, Methods, and Tools	3
HI 642	Advanced Data Management and Analytics for Healthcare	3
HI 643	Business Intelligence for Healthcare	3
HI 646	Advanced Quantitative Methods for Health Informatics	3
HI 671	Data Analytics Capstone Project I	1
HI 673	Data Analytics Capstone Project II	1
HI 675	Data Analytics Capstone Project III	3
Total Hours		**17**

Healthcare User Experience Track

Requirements		Hours
HI 599	Professional Development	0
HI 656	Human Factors in Healthcare IT Systems	3
HI 657	Human-centered Research Design Methods for Healthcare	3
HI 658	Development of User Centered Health Information Systems	3
HI 659	Qualitative Synthesis for Healthcare Insights	3
HI 672	User Experience Capstone Project I	1
HI 674	User Experience Capstone Project II	1
HI 676	User Experience Capstone Project III	3
Total Hours		**17**

Healthcare Artificial Intelligence Track

Requirements		Hours
HI 599	Professional Development	0
HCI 611	Foundations of Artificial Intelligence in Medicine	3
HCI 612	Applications of Artificial Intelligence in Medicine	3
HI 680	Artificial Intelligence Capstone Project I	1
HCI 614	Integration of Artificial Intelligence into Clinical Workflow	3
Elective - Informatics or research focus		3
HI 681	Artificial Intelligence Capstone Project II	1
HI 682	Artificial Intelligence Capstone Project III	3
Total Hours		**17**

Research Track

Requirements		Hours
HI 599	Professional Development	0
INFO 696	Introduction to Biomedical Informatics Research	3
INFO 697	Biomedical Informatics Methods	3
HI 677	Research Capstone Project I	1
HI 678	Research Capstone Project II	1
HI 679	Research Capstone Project III	3
Elective 1		3
Elective 2		3
Total Hours		**17**

Courses

HI 598. Professional Activity. 0 Hours.
Professional Development experiences associated with the MSHI degree program.

HI 599. Professional Development. 0 Hours.
Professional development experiences associated with the MSHI degree program.

HI 611. Introduction to Health Informatics and Healthcare Delivery. 3-4 Hours.
Overview of history and current status of health information technology (health IT) and health informatics within the US health care system, including approaches for planning, implementing and evaluating health IT and the legal and ethical issues involved in the use of health IT.

HI 613. Analysis and Design of Health Information Systems. 4 Hours.
Concepts, methods, approaches, standards, and tools in analyzing, modeling, designing, and implementing user centered health information systems.

HI 614. Clinical and Administrative Systems. 3 Hours.
Clinical and administrative systems with an emphasis on clinical decision support methods, tools, and systems. Types of methods, tools, and systems used in inpatient and outpatient settings, information flow across systems within healthcare settings, strategies for user centered design, implementation and evaluation of systems.

HI 617. Principles in Health Informatics. 3-4 Hours.
Underpinnings in Health Informatics policies, practices, and principles; Inter-and intra-organizational application of socio-technical information systems and data to enhance research and practice in healthcare.

HI 618. Research Methods in Health Informatics. 3 Hours.
Fundamental concepts, methods, and approaches of qualitative and quantitative data analysis, including statistical analysis and measurement techniques, for clinical and health informatics.

HI 619. Databases and Data Modeling. 3 Hours.
Concepts of data modeling, database design and administration, data architectures, and data querying for transactional and analytical data systems. Study of various data models with application to health information projects using SQL in current database management systems.

HI 620. Security and Privacy in Health Care. 3 Hours.
Security and privacy issues, legislation, regulations, and accreditation standards unique to the health care domain and relative to various group layers (individual, social, and society). Concepts, theories, methods, models, and tools related to technical security of data across networks, systems, databases and storage, audit mechanisms and controls.

HI 621. Strategic Planning Project Management and Contracting. 3 Hours.
Theory, practice, and processes needed for strategic planning of integrated health information systems. Assessing benefits of enterprise-wide information integration and tactics needed to realize these benefits. Steps needed for developing strategic plans and understanding drivers of information systems - corporate business alignment. Understanding key concepts of project management. Exposure to skills needed to negotiate contracts with vendors.

HI 624. Leadership Theory and Development. 2 Hours.
Exploration of leadership theory and development, and the role of leadership in internal and external advocacy. The emphasis is on the application of leadership theories to individuals and groups in healthcare settings.

HI 641. Healthcare Data Analytics Challenges, Methods, and Tools. 3 Hours.
Current factors, methods, and tools affecting data collection, management, analytics, integration, and reporting in healthcare, including use of various ontologies and standards, and healthcare challenges affecting data analytics.

HI 642. Advanced Data Management and Analytics for Healthcare. 3 Hours.
Automation of database management and basic Extract-Transform-Load (ETL) and data analytics tasks using advanced SQL. Creation and optimization of relational databases. Current data modeling and database architecture approaches and their uses in healthcare. Integration of data mining and analytics into database management platforms.
Prerequisites: HI 619 [Min Grade: C]

HI 643. Business Intelligence for Healthcare. 3 Hours.
Current concepts, methods and tools in Business Intelligence for healthcare. Approaches for data modeling for data warehouses, Extract-Transform-Load (ETL) processes, data marts, data integration, and data visualization.
Prerequisites: HI 619 [Min Grade: C] and HI 642 [Min Grade: C]

HI 646. Advanced Quantitative Methods for Health Informatics. 3 Hours.
Concepts, methods, and tools used in advanced quantitative data analytics to address a range of problems in health informatics, including prediction, classification, and pattern recognition across a variety of levels (individual, social group, and society).
Prerequisites: HI 618 [Min Grade: C]

HI 656. Human Factors in Healthcare IT Systems. 3 Hours.
Overview of the importance of human factors engineering in the function of healthcare IT systems and specialized challenges to user experience (UX) research in the context of the healthcare system. Application of user-centered theory, principles, data, and methods to the design of healthcare IT systems. Implementation of UX research methods to evaluate and understand the interactions between healthcare IT systems and their users.

HI 657. Human-centered Research Design Methods for Healthcare. 3 Hours.
Design Thinking methodology intensive. Discussion of the importance of qualitative user research. Understanding of discovery to enable Identification of proper user research approaches and establishing research goals. Overview tools and processes for deep research discovery. Students will select a healthcare context for the application of research methods.

HI 658. Development of User Centered Health Information Systems. 3 Hours.
Development approaches involving principles of human-centered design, leading to high fidelity health information system prototypes.

HI 659. Qualitative Synthesis for Healthcare Insights. 3 Hours.
Overview and execution of qualitative research methods and data gathering within the healthcare context to enable the delivery of solutions. Focus on the application of research theories, methods, and tools to deliver insights and qualitative and quantitative outputs. Understanding socio-technical factors relative to fundamental interface design elements and interface layouts across modalities. Journey mapping, concepting, user flows, and wireframing will be generated.

HI 660. Healthcare Requirements Analysis. 3 Hours.
Approach to, identification, documentation and presentation of common health informatics problems. A focus on identifying root problems and unambiguous metrics for post-evaluation to ensure final deliverable meets intended need. Exposure to project management methodologies and six sigma processes to facilitate the logic needed for troubleshooting data problems in healthcare.

HI 661. Advanced Database Design and SQL for Healthcare. 3 Hours.
Study of common healthcare data structures and environments. Creation of database components; in-depth SQL coding; data warehouse designs; tools such as TOAD, SQL Explorer, Management Studio.

HI 662. Healthcare Business Intelligence. 3 Hours.
Exposure to typical business intelligence (BI) tool sets and identification of business objects. Building of the metalayer involved in a business intelligence system and exposure to Business Objects, Crystal Reports, SSRS.

HI 664. Data Analytics Capstone Project. 1-5 Hour.
Rigorous project that provides opportunity for focused investigation of healthcare data problems in real-world settings and for application of problem-solving methodologies for development and execution of solutions. Investigation and application of theory through practical implementation project.

HI 671. Data Analytics Capstone Project I. 1 Hour.
Initiation of first steps in identifying and developing the HI Capstone Project; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problem solving methodologies for development and execution of solutions.

HI 672. User Experience Capstone Project I. 1 Hour.
Initiation of first steps in identifying and developing the HI Capstone Project; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problem solving methodologies for development and execution of solutions.

HI 673. Data Analytics Capstone Project II. 1 Hour.
Continuation course of the HI Capstone Project involving project execution, management, and dissemination; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 674. User Experience Capstone Project II. 1 Hour.
Continuation course for the HI Capstone Project involving project proposal development; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 675. Data Analytics Capstone Project III. 3 Hours.
Final course for the HI Capstone Project involving project execution, management, and dissemination; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 676. User Experience Capstone Project III. 3 Hours.
Final course for the HI Capstone Project involving project execution, management, and dissemination; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 677. Research Capstone Project I. 1 Hour.
Initiation of first steps in identifying and developing the HI Capstone Project: the capstone project is a focused investigation of health informatics problem in a real-world setting and application of problem solving methodologies for development and execution of solutions.

HI 678. Research Capstone Project II. 1 Hour.
Continuation course of the HI Capstone Project involving project execution, management, and dissemination; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 679. Research Capstone Project III. 3 Hours.
Final course for the HI Capstone Project involving project execution, management, and dissemination; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 680. Artificial Intelligence Capstone Project I. 1 Hour.
Initiation of first steps in identifying and developing the HI Capstone Project; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problem-solving methodologies for development and execution.

HI 681. Artificial Intelligence Capstone Project II. 1 Hour.
Rigorous project that provides opportunity for focused investigation of a Health Informatics issue in a real-world setting and for application of problem-solving methodologies for development and execution of solutions. Investigation and application of theory through a practical implementation project.

HI 682. Artificial Intelligence Capstone Project III. 3 Hours.
Final course for the HI Capstone Project involving project execution, management, and dissemination; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 685. Principles in Health Informatics. 3-4 Hours.
Underpinnings in health informatics policies, practices, and principles. Inter-and intra-organizational application of information systems and data to enhance research and practice in healthcare.

HI 690. Administrative Internship. 4-8 Hours.
Structured field experiences in health care or other enterprises associated with health care industry. Includes a mentoring relationship with a preceptor and an opportunity for application of information resource management theory and strategies. Foundation for professional development and assists in refining skills and behaviors necessary for successful practice in a complex professional, social, political, and technological environment.

HI 694. Special Topics in Health Informatics. 1-4 Hour.
Study of selected topics in health informatics. May be repeated for credit.

HI 695. Independent Study in Health Informatics. 1-4 Hour.
Opportunity to investigate, perform activities and/or conduct a project related to a narrow topic in Health Informatics that corresponds with the current research of HI faculty, including medical informatics, nursing informatics, computer and communication sciences, library science, etc. May be repeated for credit.

HI 698. Simulation Capstone/Non-thesis Research. 1-8 Hour.
Rigorous culminating project that provides the opportunity for focused investigation of simulation applications in a real-world setting. Investigation and application of theory through a practical project.

HI 699. Master's Level Thesis Research. 4-8 Hours.
Original research in health informatics and interpretation of results. Demonstrates student's acquaintance with literature of field and competency in proper selection and execution of research methodology. Recommended for students planning to pursue a doctoral degree. May be repeated for credit (8 hours maximum credit allowed).
Prerequisites: GAC M

HI 725. Information Systems Theory and Practice. 3 Hours.
Investigation of appropriate research methods to assess theoretical models involving interdependencies and relationships between Information technology, human behavior, and organizational and socio-technical contexts; review of qualitative and quantitative research methods using IS journal article exemplars.

HI 777. Mixed Methods Research I. 3 Hours.
Provide introduction to the field of mixed methods research: essence of mixed methods research, rationale for using it, its fundamental principles and key characteristics, major design applications, and means of assessing the quality of mixed methods inferences. Learn how the mixed methods research process is shaped by personal, interpersonal, and social contexts and how mixed methods intersects with other quantitative and qualitative research approaches and designs.

Healthcare Leadership

Degrees Offered:	D.Sc.
Director:	Dr. Robert Hernandez
Phone:	(205) 934-1665
E-mail:	hernande@uab.edu
Website:	http://www.uab.edu/execdoc

Healthcare Leadership

Prospective students should refer to the Admissions tab on the program webpage (www.uab/execdoc) to obtain specific admissions requirements on how to apply to the program. Information about how to apply to the Graduate School is available at https://www.uab.edu/graduate/admissions/.

Doctor of Science Program Information

The Doctor of Science (D.Sc.) in Healthcare Leadership program is designed for healthcare executives who are seeking to engage in a rigorous course of study that will also permit them to retain their demanding work and life responsibilities. D.Sc. students are interested in continuing a practice-focused career, as opposed to the academic career sought by most residential Ph.D. students.

The program is offered by the Department of Health Services Administration. Faculty associated with the School of Public Health, Lister Hill Center for Health Policy, Center for Outcomes and Effectiveness Research and Education, and other national experts also contribute to student learning.

Admission Requirements

Qualified applicants will preferably have a master's degree in health administration; health informatics; business administration; or a related field. Degree(s) must be from an accredited institution. In addition, qualified applicants will have a minimum of five years of mid– to senior-level managerial experience in health management.

Students whose first language is not English must submit recent scores for the Test of English as a Foreign Language (TOEFL) exam or IELTS. Applicants who have received a degree from an accredited U.S. institution or from institutions in countries where English is the primary language of instruction are not required to submit the TOEFL or IELTS score.

The UAB Graduate School has approved a waiver of the GRE/GMAT requirement for all applicants to the Executive Doctoral Program in Healthcare Leadership.

The application procedure for the D.Sc. in Healthcare Leadership Program requires both an application to the UAB Graduate School as well as supplemental materials that must be submitted directly to the D.Sc. Program Office. A full checklist of required items can be found on the “Application Process” page of the program website www.uab.edu/execdoc.

Applications are reviewed by the Admissions and Policy Committee of the Executive D.Sc. in Healthcare Leadership Program. The committee forwards a recommendation to the Dean of the UAB Graduate School who then communicates official admission decisions via written letter.

As it is based on a cohort model, the Executive D.Sc. Program only admits for the fall of each year. Applicants who complete applications prior to February 1 will be given priority in the admission process. Applications received after February 1 will be considered on a space-available basis.

Program of Study

The program of study consists of four components

1. Courses in administration and health systems,
2. Courses in research methodology and statistics,
3. Comprehensive examinations,
4. The doctoral dissertation.

Students must complete all coursework and pass a comprehensive examination before work can officially begin on the dissertation. The investigation and other special work leading to the dissertation must be performed directly under the guidance and supervision of a four-person committee of the UAB graduate faculty. The normal minimum period in which the doctoral degree can be earned is three years of full-time study.

Degree Completion

The granting of the D.Sc. degree is based on completion of all required coursework, residency requirements, a comprehensive examination, dissertation requirements, and the recommendation of the Healthcare Leadership graduate program director and the dissertation committee.

Mission, Vision, and Values Statements

The mission of the Executive Doctoral Program is to develop highly qualified strategic management practitioners and scholars. We accomplish this mission through: our strategic management courses, faculty/student interaction, publishing and presenting our work, and teaching others.

Additional Information

Deadline for Priority Application:	February 1st. After February 1st, applications will be considered on a space-available basis.
Number of Evaluation Forms Required:	Three
Entrance Tests:	TOEFL required for international applicants whose native language is not English.

Contact Information

For detailed information, contact the Program Office of the Doctoral Programs in Healthcare Leadership, UAB School of Health Professions Building, 1716 9th Avenue South, Birmingham, AL 35294-1212.
Telephone 205-934-3588
Fax 205-975-6608

E-mail execdoc@uab.edu (phdha@uab.edu)
Web www.uab/execdoc

Courses

AHD 632. Quantitative Methods. 3 Hours.
Selected statistical methods and analytical tools for hypothesis testing and to inform evidence-based decision-making in hospitals and health care organizations, use of computer applications such as Excel and Stata for conducting analyses.

AHD 705. Health Care Finance. 3 Hours.
Financial management functions, third-party reimbursement, determination of costs and charges, analysis of financial positions, working capital management, budgeting, capital expenditure analysis, and case studies.

AHD 706. Strategic Management Theory and Research. 3 Hours.
This course enables students to become well-versed in the healthcare strategic management scholarly literature; and ultimately contribute to it. Mastering the healthcare strategy literature requires different skills than those needed to manage an organization strategically. Thus, this course focuses on the relevant literature and not on the process of strategic planning or management.

AHD 707. Research Methods. 3 Hours.
This course introduces methods and issues relevant to research in the business disciplines and in health services. The various business disciplines and the broad field of health services draw heavily from the social and behavioral sciences as the basis for much of their theoretical and empirical work. This course will focus on issues that are relevant generally to social science research, with the goal of applying that information to research in health services.

AHD 710. Comparative Health Systems. 3 Hours.
This course allows students to compare the U.S. health care delivery system with approaches used in other countries and to identify health system reform efforts occuring in selected global regions. Empahsis will be placed on the role of the health system within slected forms of government and at various levels of economic development.

AHD 711. Health Systems Leadership. 3 Hours.
Evidence based materials used to teach skills to develop an understanding of leadership theories and application through the use of fundamental leadership principles proven to be successful in the healthcare industry.

AHD 714. Marketing Strategy and Research. 3 Hours.
This course will introduce the doctoral student to the study of marketing strategy through an examination of the literature in the field. The course is intended to provide a broad background for understanding and conducting research in this area. As such, it will require students to draw on their knowledge of other functional and organizational topics as well as other social sciences (e.g., psychology, sociology, and economics) to better understand the subject of marketing strategy from an academic and organizational perspective.

AHD 715. Research in Organization Theory. 3 Hours.
Course designed to develop the student's ability to use theory based research in health-care organizations. This course will cover the major theoretical perspectives on organizations and will link these to contemporary empirical studies. Special perspectives on organizations and will link these to contemporary empirical studies. Special focus in placed on exploring the link between theory and research exhibited in this empirical work to enable students to develop the capability of using theory to guide their own research.

AHD 716. Macro-Environmental Analysis. 3 Hours.
Macro-environmental analysis is strategic in nature and will focus on specific macro-environmental conditions or policies that may impact the delivery and financing of health care services and product. Macro-environmental analysis is traditionally the first step in the development of a strategic plan; sometiems referred to as external market analysis or political, economic, social, and technological (PEST) analysis.

AHD 718. Strategic Implementation and Evaluation. 3 Hours.
Examination of types of evaluations and evaluation designs, emphasis on application of evaluations in organizations; development of indicators; impact measurement.

AHD 722. Regression Analysis. 3 Hours.
Various approaches to regression analysis, including ordinary least squares and probability models, such as logit and probit.

AHD 727. Applied Multivariate Statistics for Health Administration Research. 3 Hours.
This is a survey course on the application of multivariate techniques in health care management research. The course focuses on application of multivariate statistical methods to health administration research questions, with emphasis on interpretation within real health care management problems.

AHD 730. Health Econ & Insurance. 3 Hours.
Development of economic principles and describes system of health care financing and delivery in the United States, providing a basis for analyzing health management and policy options.

AHD 731. Health Policy. 3 Hours.
Exploration of the health policy-making process in the U.S., the impact of policy decisions (or lack of decisions) on key stakeholders, and needed research and policy approaches to these issues.

AHD 735. Healthcare Quality Improvement. 3 Hours.
Policy issues and managerial methods related to quality and safety in healthcare organizations. Role of senior executives, board members, physician leaders in quality improvement and in creating a quality-focused organizational culture. Public and private sector approaches to quality measurement and improvement.

AHD 775. Strategic Planning and Mgt. 3 Hours.
Assessment of strategic management literature applied to health services organizations, exploration of strategy formulation, strategic content, and implementation and evaluation of topics for health care organizations.

AHD 778. Special Topics in Administration - Health Services. 1-4 Hour.
Exploration of current issues in Health Services Administration.

AHD 780. Strategic Information Systems. 3 Hours.
Examination of current research on role of information systems in strategic management and sources available to health care organizations for strategic decision support.

AHD 798. Non-Dissertation Research. 1-6 Hour.
Mentored research to design a study addressing a significant healthcare delivery problem.

AHD 799. Dissertation Research. 1-6 Hour.
Mentored research to conduct a study addressing a significant healthcare delivery problem.
Prerequisites: GAC Z

Healthcare Quality and Safety

Degree Offered:	M.S.
Program Director:	Allyson Hall, PhD
Phone:	(205) 934-3509
E-Mail:	askhqs@uab.edu
Website:	www.uab.edu/hqs

Master of Science in Healthcare Quality and Safety

The Master of Science in Healthcare Quality and Safety will prepare individuals to provide leadership in the design, implementation, and evaluation of clinical and non-clinical process improvement and patient safety activities in complex healthcare environments. The program will comprise a didactic and experiential curriculum including:

- Quantitative and analytical methods and statistical process control techniques
- Quality management models such as PDSA, Lean, and Six Sigma
- Risk and patient safety assessment and management techniques
- Implementing and managing cultural and organizational change
- Team leadership and communication
- Leadership of high reliability organizations
- Integrative capstone project

The program is housed in the Department of Health Services Administration (HSA) in the School of Health Professions. The HSA Department offers graduate degrees in health administration and health informatics, both of which include courses with leadership, quality improvement, and data analytics content, as well as a graduate degree in healthcare simulation, and a graduate certificate in Healthcare Quality and Safety (HQS).

Admission Requirements

Admission requirements include eligibility for admission to the UAB Graduate School, at least three years of relevant work experience, and currently working full-time in the healthcare industry. Applicants must have completed a bachelor's degree (or higher) from an accredited college or university or from a recognized university abroad, with a minimum GPA of 3.0 on the last 60 hours of course work.

Additional requirements will include completion of a program-specific application showing quality or safety-related employment and previous relevant training, personal statement regarding interest in the program, three professional letters of recommendation.

An admissions committee comprised of, faculty, program administrators and HQS course directors will review applications and make final admission decisions based on desired cohort size. Application to the program may be made September through May 31, preceding the expected date of enrollment for the next fall term. Applications received after May 31 are considered on a space-available basis.

Entry Term:	Fall Semester
Deadline for All Application Materials to be in the Graduate School Office:	July 1, after July 1 applications will be considered on a space available basis
Length of Study:	36 Credit Hours
Number of Evaluation Forms Required:	Three Professional Letters of Recommendation

Master of Science in Healthcare Quality and Safety and Executive Health Administration Coordinated Degree

Students wishing to pursue simultaneously the Master of Science in Healthcare Quality and Safety and the executive format of the Master of Science in Health Administration degrees must be accepted into both programs and complete twenty-eight (28) courses, including an interactive capstone experience course. A student who enters a coordinated program, but subsequently decides to pursue only one of the degrees, must satisfy all the requirements of the degree sought.

Graduate Certificate in Healthcare Quality and Safety

Prospective students should use this checklist to obtain specific admissions requirements on how to apply to Graduate School.

Degree Offered:	Graduate Certificate
Program Director:	Allyson Hall, PhD
Medical Director:	Scott Buchalter, MD
Phone:	(205) 934-3509
E-Mail:	askhqs@uab.edu
Website:	www.uab.edu/hqs

Certificate Information

The Graduate Certificate in Healthcare Quality and Safety is a unique, multidisciplinary approach to the analysis and solution of complex problems. The program, which is offered totally online, prepares clinical and administrative professionals to deploy quality- and safety-focused strategies for their organizations. HQS is a high quality, academically rigorous forum for developing the individual knowledge and skills needed to conduct clinical practice and non-clinical process improvement projects in a complex medical environment.

The certificate program, housed in the Department of Health Services Administration in the School of Health Professions, requires a combined approach using data and models from the natural, social, technological, behavioral and life sciences, and other specialized fields. The curriculum is delivered by an interdisciplinary team of faculty from the University of Alabama at Birmingham Schools of Health Professions, Nursing, Public Health and Medicine.

Certificate Options

This certificate is offered as a blended or online option.

Blended

- Students complete the 4-course certificate in an accelerated cohort: 4 months/1 semester

- Students complete 50 % of the curriculum online and 50 % face-to-face over four long weekends

Online

- Students complete the 4-course certificate over 2 semesters
- Students will take 2 courses during the fall semester and 2 courses during the spring semester.

Admission Requirements

- Undergraduate, graduate or professional degree in a health-related field and at least three years of experience in health care
- Currently working full-time in health care.
- Personal statement regarding interest in the program and the identification of a quality related project topic
- Minimum G.P.A of 3.00 or above for the past 60 hours of course work
- Non-refundable application fee of $50, payable online
- Official transcripts of all previous academic work beyond the secondary level
- Current Resumé or CV which outlines your professional work experience

Entry Term:	Blended Option: Fall and Spring Semesters; Online Option: Fall Semester
Deadline for All Application Materials to be in the Graduate School Office:	Blended Option: July 1st or Nov 1st; Online Option: July 1st -- applications submitted after the deadlines will be considered on a space available basis
Length of Study:	15 Credit Hours

Required Coursework

Requirements		Hours
HQS 600	Introduction to Clinical Quality Improvement	4
HQS 610	Quantitative Methods, Measurement, and Tools for Quality Improvement	4
HQS 625	Fundamentals of Patient Safety	4
HQS 630	Leadership of High Reliability Healthcare Organizations	3
Total Hours		**15**

Healthcare Quality and Safety Certificate for Executive Master of Science in Health Administration

Students enrolled in the Executive Master of Science in Health Administration program, may pursue a graduate certificate in Healthcare Quality and Safety. To obtain the certificate, Executive MSHA students may add an online HQS certificate course in each fall and spring term, increasing their credit hours from 9 to 13. For more information, please contact the HQS or MSHA programs.

Contact Information

For detailed information, contact the Department of Health Services Administration, Healthcare Quality and Safety Program, UAB School of Health Professions, SHPB 580A, 1716 9th Avenue, Birmingham, Alabama 35294-1212.
Telephone 205-934-3509.

E-mail HQS (SHRP-GCHQS@uab.edu) askhqs@uab.edu

Website: http://www.uab.edu/hqs

Graduate Certificate in Healthcare Quality and Safety

A student who receives two grades of "C", or any grade of "F" on any course taken in pursuit of the HQS Graduate Certificate will be dismissed from the program.

Requirements		Hours
HQS 600	Introduction to Clinical Quality Improvement	4
HQS 610	Quantitative Methods, Measurement, and Tools for Quality Improvement	4
HQS 625	Fundamentals of Patient Safety	4
HQS 630	Leadership of High Reliability Healthcare Organizations	3
Total Hours		**15**

Master of Science in Healthcare Quality and Safety

A student who receives two grades of "C", or any grade of "F" on any course taken in pursuit of the MS degree in Healthcare Quality and Safety will be dismissed from the program.

Requirements		Hours
HQS 600	Introduction to Clinical Quality Improvement	4
HQS 610	Quantitative Methods, Measurement, and Tools for Quality Improvement	4
HQS 613	Advanced Data Use in Quality Improvement and Patient Safety	3
HQS 625	Fundamentals of Patient Safety	4
HQS 630	Leadership of High Reliability Healthcare Organizations	3
HCS 640	Project Management: Leading Successful Healthcare Initiatives	3
HQS 635	Healthcare Policy and Regulation	3
HQS 655	Population Health for Healthcare Quality Leaders	3
HCS 660	Financial Management for Healthcare Quality Leaders	3
HQS 675	Evaluating and Designing Quality Improvement Models	3
HQS 698	Integrative Capstone Experience/Non-Thesis Project	3
Total Hours		**36**

Courses

HQS 600. Introduction to Clinical Quality Improvement. 4 Hours.
Clinical quality improvement theory; classes of outcomes; process management; management tools and modeling techniques for improvement of clinical processes and decision-making.

HQS 610. Quantitative Methods, Measurement, and Tools for Quality Improvement. 4 Hours.
Statistical process control techniques applied to clinical and patient service processes, including Lean and Six Sigma methodologies; data system design concepts applied to clinical and financial data for managing health care business processes.

HQS 612. Health Data Management and Analytics for Enterprise Performance Improvement. 4 Hours.
Managing health data across the information lifecycle; assuring data quality and integrity; data visualization and analytics techniques; health information governance.
Prerequisites: HQS 600 [Min Grade: C] and HQS 610 [Min Grade: C] and HQS 625 [Min Grade: C] and HQS 630 [Min Grade: C]

HQS 613. Advanced Data Use in Quality Improvement and Patient Safety. 3 Hours.
Applying quantitative techniques to clinical and administrative data to inform and improve healthcare quality and patient safety outcomes.
Prerequisites: HQS 610 [Min Grade: C]

HQS 615. Collaborative Analytics for Quality and Safety Improvement. 3 Hours.
Survey of analytics used by HCO improvement project teams; emphasis on conceptual understanding of analytics approaches to investigate and resolve organizational quality and safety issues.
Prerequisites: HQS 610 [Min Grade: C] and HQS 612 [Min Grade: C]

HQS 625. Fundamentals of Patient Safety. 4 Hours.
Nature and science of medical error; strategies for design of safety-critical systems; hazard analysis and risk assessment in health care organizations; design elements of safety programs and high reliability systems.

HQS 630. Leadership of High Reliability Healthcare Organizations. 3 Hours.
Applying concepts of high reliability organizations to create an organizational culture that supports strong, functional, and safe patient care environments resulting in quality clinical care and patient satisfaction.

HQS 635. Healthcare Policy and Regulation. 3 Hours.
External drivers for quality and safety improvement in healthcare organizations, particularly policies and regulations affecting reimbursement. Discussion and analysis of key federal legislation and regulations promulgated by the Centers for Medicare and Medicaid Services (CMS) and The Joint Commission.
Prerequisites: HQS 600 [Min Grade: C] and HQS 630 [Min Grade: C] and HQS 610 [Min Grade: C] and HQS 625 [Min Grade: C]

HQS 655. Population Health for Healthcare Quality Leaders. 3 Hours.
Foundational skills needed to work in teams to effectively collaborate in the development and implementation of population health programs aimed at improving health outcomes. Special emphasis will be on evidence-based care and patient and community engagement.

HQS 675. Evaluating and Designing Quality Improvement Models. 3 Hours.
Application of analytical and decision tools to determine appropriate enterprise models for quality improvement, including problem identification, selection of metrics, analytical approaches, prioritization criteria, and post-implementation evaluation.
Prerequisites: HQS 612 [Min Grade: C] and HQS 635 [Min Grade: C]

HQS 678. Special Topics in Healthcare Quality and Safety. 1-4 Hour.
Exploration of current issues in Healthcare Quality and Safety.

HQS 698. Integrative Capstone Experience/Non-Thesis Project. 3-6 Hours.
Investigation of a process or safety improvement opportunity in a healthcare organization to propose a solution; application of the concepts and tools presented in the program courses. A written project report is required.
Prerequisites: HQS 615 [Min Grade: C] and HQS 635 [Min Grade: C] and HQS 675 [Min Grade: C] and HA 650 [Min Grade: C]

Healthcare Simulation

Master of Science in Healthcare Simulation

Degree Offered:	M.S.
Program Director:	Michelle Brown, PhD
Phone:	(205) 934-9617
Email:	michellebrown@uab.edu
Website:	www.uab.edu/sim

Program Overview

The Master of Science in Healthcare Simulation is designed to prepare you with leadership and quality improvement skills in healthcare simulation in order to improve patient safety, increase communication effectiveness, refine teamwork, and enhance care delivery. By developing expertise in healthcare simulation, you will be equipped with a unique skill set to impact patient outcomes in your organization through the innovation of simulation. We believe that interprofessional collaboration is fundamental in being a successful healthcare simulationist.

The curriculum is taught by faculty with a variety of clinical and administrative experiences. Fellow classmates will be from diverse backgrounds who are interested in working collaboratively to improve patient care with simulation. Throughout the program, you will be challenged to think creatively and have opportunities to integrate simulation into your current practice.

Admission Requirements

Admission requirements include eligibility for admission to the UAB Graduate School. Experience in the healthcare industry or a related field is preferred. Applicants must have a bachelor's degree (or higher) from an accredited college or university or from a recognized university abroad, with a minimum GPA of 3.0 in coursework.

Additional requirements include submission of a personal statement regarding interest in the program, two letters of recommendation.

Requirement	Fulfilled By:
Deadline for Entry Term(s):	Fall, Spring, Summer
Deadline for All Application Materials to be in the Graduate School Office:	August 1st, December 1st, May 1st
Entrance Tests:	The Test of English as a Foreign Language (TOEFL) and the Test of Written English (TWE) for international applicants from non-English speaking countries
Number of Recommendation Letters Required:	Two

Comments:	Transcript evaluation by WES is required for applicants with foreign university degrees

Contact Information

For detailed information, contact the Department of Health Services Administration, Master of Science in Healthcare Simulation Program, UAB School of Health Professions, SHPB 590A. Physical address: 1716 9th Avenue South. Mailing address: 1716 9th Avenue South, Birmingham, AL 35294
Telephone 205-934-3509
Fax 205-975-6608
E-mail SimMasters@uab.edu

Master of Science in Healthcare Simulation

The MS in Healthcare Simulation program consists of a total of 33 semester hours. Thirty semester hours are considered required core courses. The remaining 3 semester hours are elective courses chosen based on student interest and program director approval. One on-campus visit is required in the first semester of the program.

Requirements		Hours
HCS 575	Introduction to Healthcare Simulation for Quality and Safety	3
HCS 620	Current Trends in Simulation	2
HCS 625	Simulation Methodology	3
HCS 626	Healthcare Simulation Laboratory	1
HCS 635	Advanced Debriefing	3
HCS 640	Project Management: Leading Successful Healthcare Initiatives	3
HCS 698	Simulation Capstone/Non-thesis Research	3
HQS 600	Introduction to Clinical Quality Improvement	4
HCS 660	Financial Management for Healthcare Quality Leaders	3
HQS 630	Leadership of High Reliability Healthcare Organizations	3
HCS 610	Instructional Design in Simulation	2
Select 3 hours of elective coursework approved by the program director. [1]		3
Total Hours		**33**

[1] Students must take a minimum of 3 semester hours of elective courses. Program director approval is required for all elective courses

Healthcare Simulation Graduate Certificate

The Graduate Certificate in Healthcare Simulation meets the growing demand of healthcare simulation educators and leaders. Graduates will be able to design and implement simulations aimed at improving teamwork, communication, and clinical skills according to evidence-based practices.

Our program is delivered online with on-campus visit for 3 1/2 days in September. It is comprised of 15 credits, completed over three consecutive semesters.

Credentials Conferred

The Graduate Certificate in Healthcare Simulation is awarded by the University of Alabama at Birmingham.

Length of Study

The certificate requires 15 credits, which can be completed in 3 semesters.

Program Entrance Date

Fall semester -- deadline for all application materials to be in the Graduate School Office: August 1.

TYPICAL HEALTHCARE SIMULATION CURRICULUM

Requirements		Hours
HCS 575	Introduction to Healthcare Simulation for Quality and Safety	3
HCS 610	Instructional Design in Simulation	2
HCS 625	Simulation Methodology	3
HCS 626	Healthcare Simulation Laboratory	1
HCS 620	Current Trends in Simulation	2
HCS 630	Research in Simulation	1
HCS 635	Advanced Debriefing	3
Total Hours		**15**

Courses

HCS 575. Introduction to Healthcare Simulation for Quality and Safety. 3 Hours.
Introductory course on origins and current applications for healthcare simulation; overview of simulation methodologies and application in education, training, quality improvement, and patient safety.

HCS 610. Instructional Design in Simulation. 2 Hours.
Instructional Design in Simulation applies the foundational concepts in the field of instructional design to the growing field of healthcare simulation. This course focuses on the processes of analysis, design, development, implementation, and evaluation as they relate to developing quality simulation learning experiences.

HCS 620. Current Trends in Simulation. 2 Hours.
Survey of emerging technologies as well as new applications and best practices in the delivery of simulation.

HCS 625. Simulation Methodology. 3 Hours.
Intensive focus on the development of simulation sequences to meet institutional priorities; emphasis on simulation case development, including debriefing and assessment strategies; teamwork and interprofessional competencies.

HCS 626. Healthcare Simulation Laboratory. 1 Hour.
Participation in simulations; application of research-based strategies for designing and implementing simulation scenarios; debriefing and developing solutions to common issues in simulation.

HCS 630. Research in Simulation. 1 Hour.
Introduction to simulation-focused research and present an overview of the current simulation evidence base.

HCS 635. Advanced Debriefing. 3 Hours.
In-depth review and application of current debriefing models in the field of simulation. Emphasis on choosing effective debriefing models for various modalities of simulation.
Prerequisites: HCS 625 [Min Grade: C]

HCS 640. Project Management: Leading Successful Healthcare Initiatives. 3 Hours.
Techniques for planning, scheduling, controlling, resource allocation, and performance measurement activities required for successfully completing a project.

HCS 645. Simulation Modeling. 3 Hours.
Introduction to basic concepts, approaches, and processes relevant to computer modeling in healthcare simulation environments; use of computer modeling to shorten design cycles, innovate new processes, evaluate designs, and simulate the impacts of alternative approaches relevant to healthcare environments; includes structure system analysis, model construction, data collection, and computer simulation languages.

HCS 655. Population Health for Healthcare Quality Leaders. 3 Hours.
Focuses on the foundational skills needed to work in teams to effectively collaborate in the development and implementation of population health programs aimed at improving health outcomes. Special emphasis will be on evidence-based care and patient and community engagement.

HCS 660. Financial Management for Healthcare Quality Leaders. 3 Hours.
Basic concepts in financial management; introduction to financial accounting and management accounting; emphasis on evaluating the financial impact of new programs.

HCS 675. Special Topics in Healthcare Simulation. 1-4 Hour.
Exploration of current issues in Healthcare Simulation.

HCS 698. Simulation Capstone/Non-thesis Research. 1-4 Hour.
Rigorous culminating project that provides the opportunity for focused investigation of simulation applications in a real-world setting. Investigation and application of theory through a practical project.

Nuclear Medicine and Molecular Imaging Sciences

Degree Offered	M.S.
Program Director	Amy Brady, M.A.Ed, CNMT
Phone	(205) 934-1785
E-Mail	amybrady@uab.edu
Website	https://www.uab.edu/shp/cds/nmmis

Program Information

Program Mission

The mission of the Master of Science in Nuclear Medicine and Molecular Imaging Sciences (NMMIS) program in the School of Health Professions at the University of Alabama at Birmingham (UAB) is to provide comprehensive didactic and clinical educational experiences reflecting 21st century workforce demands that prepare graduates to be competent practitioners and innovative leaders within the nuclear medicine profession.

Admission Requirements

In addition to the general Graduate School admission requirements, applicants to the M.S. program must:

- Hold a baccalaureate degree from an accredited college or university, along with pre-requisite course requirements,
- Have a minimum undergraduate GPA of 3.0 (A= 4.0), computed from all undergraduate credits or from the last 60 semester hours of undergraduate course credit,
- Apply for admission to the UAB NMMIS Program,
- Complete a clinical observation and write a reflection on the observation,
- International students from non-English speaking countries are required to submit English proficiency scores (TOEFL/IELTS/PTEA/Duolingo) that meet the Graduate School's minimum score requirements: TOEFL - 80; IELTS - 6.5; PTEA:- 53; IELA - 176 - Duolingo - 120. See other international admission requirements at https://www.uab.edu/graduate/admissions/international-applicants.

The completed application and observation form must be on file with the program office. All eligible applicants will be interviewed. Eligible late applicants will be considered on a space-available basis up to August 1st.

If accepted, students must complete the UAB medical history questionnaire and physical, provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service before enrollment. A background check and drug screen will be required at program admission and prior to clinical placement. Persons with a baccalaureate degree may be eligible to register for courses as non-degree seeking graduate students before acceptance into the M.S. program. If a non-degree seeking graduate student meets the M.S. program admission requirements, up to 12 semester hours of approved non-degree graduate coursework may be accepted for the M.S. degree. Admission of a student to any course as a non-degree student does not constitute admission to the M.S. degree program.

Early Acceptance

Early Acceptance Programs are designed for academically superior high-school students. Early Acceptance Programs allow high achieving students to be admitted to the Master of Science in Nuclear Medicine and Molecular Imaging Sciences program at the same time they are admitted to an undergraduate program.

Eligible students are required to maintain a 3.5 undergraduate GPA and complete the following pre-requisite courses: MA 106, CH 105-CH 108 or CH 115-CH 118, BY 216 or NMT 320, BY 115, BY 116, MA 180, PH 201, PH 202, HCM 350, HCM 330, CDS 425

Essential Functions

Essential functions are physical abilities, mental abilities, skills, attitudes, and behaviors the students must show evidence of to be able perform at each stage of their didactic and clinical education. A list of essential functions is on file in the NMMIS Program Office and in the NMMIS Student Handbook.

If you have a disability, but have not contacted Disability Support Services (DSS), please call (205) 934-4205 (voice) or (205) 934-4248 (TDD), or visit the DSS offices at 1701 9th Avenue South. Additional information is available at http://www.uab.edu/students/disability/.

Accreditation and Certification

Nuclear Medicine and Molecular Imaging Sciences academic programs are accredited by the Joint Review Committee on Nuclear Medicine Technology Programs (JRCNMT). Program graduates are eligible to apply for the certification examination offered by both the Nuclear

Medicine Technology Certification Board (NMTCB) or the American Registry of Radiological Technologists (ARRT).

JRCNMT

2000 W. Danforth Road

Suite 130, #203

Edmond, OK 73003

Phone: 405.285.0546

Fax: 405.285.0579

jrcnmt@coxinet.net

http://www.jrcnmt.org/

NMTCB 3558 Habersham at Northlake Building I Tucker, GA 30084 Phone: 404.315.1739 Fax: 404.315.6502 board@nmtcb.org https://www.nmtcb.org/

ARRT 1255 Northland Drive St. Paul, MN 55120 Phone: 651.687.0048 Fax: 651.687.3299 https://www.arrt.org/

Additional Information

Entry Term	Fall Semester
Deadline for All Application Materials to be in the Graduate School Office	First Consideration: December 1; Space available basis after first consideration, up to August 1
Entrance Tests	For international applicants from non-English speaking countries, minimum score requirements: TOEFL - 80; IELTS - 6.5; PTEA:-53; IELA - 176 - Duolingo - 120.
Comments	Scholarship money is available, but is very limited; transcript evaluation by WES is required for applicants with foreign university degrees

Contact Information

For detailed information, contact the Department of Clinical and Diagnostic Sciences, Nuclear Medicine and Molecular Imaging Sciences Program, UAB School of Health Professions, SHPB 446, 1716 9th Avenue South, Birmingham, Alabama 35294-1212.
Telephone 205-934-3209.
E-mail AskCDS@uab.edu

Master of Science in Nuclear Medicine and Molecular Imaging Sciences

The Master of Science in Nuclear Medicine and Molecular Imaging Sciences follows a Core/Track model which consists of a total of 64 semester hours. 39 semester hours are taken in the core Nuclear Medicine and Molecular Imaging Sciences courses. The remaining 25 semester hours are taken on one of three specialty tracks (Imagining Specialists, Radiation Safety, or Research).

Requirements		Hours
CDS 505	Professional Skills Development	1
NMT 604	Introduction to Nuclear Medicine, Management, Patient Care & Lab	2
NMT 605	Cross-Sectional Anatomy	2
NMT 620	Nuclear Medicine Physics, Instrumentation, and Lab	4
NMT 625	CT Physics and Instrumentation	2
NMT 631	Nuclear Medicine Anatomy & Physiology - Procedures I	4
NMT 632	Nuclear Medicine Anatomy & Physiology - Procedures II	2
NMT 641	Regulations, Radiation Protection/Biology and Lab	4
NMT 653	Research Methodology and Publication Analysis	2
NMT 660	Radiopharmacy, Pharmacology & Lab	4
NMT 691	NMT Clinical Practice	5
NMT 692	NMT and CT Clinical Practice	7
NMT 696	Seminar and Registry Review	2
Total Hours		**41**

Imaging Specialist Track

Requirements		Hours
NMT 624	Physics/Instrumentation of Nuclear Magnetic Resonance	2
NMT 633	Computed Tomography Procedures	2
NMT 634	MRI Scanning and Sequence	2
NMT 692	NMT and CT Clinical Practice	7
NMT 694	Computed Tomography Clinical Practice	7
NMT 698	Non-Thesis Research	4
Total Hours		**24**

Radiation Safety Track

Requirements		Hours
MHP 651	Advanced Radiation Biology	3
MHP 691	Supervised Practice	8
MHP 611	Physics of Diagnostic Imaging	3
NMT 691	NMT Clinical Practice	6
NMT 698	Non-Thesis Research	4
Total Hours		**24**

Research Track

Requirements		Hours
NMT 697 Journal Club in Nuclear Medicine and Molecular Imaging Sciences will be taken two semesters		2
NMT 697	Journal Club in Nuclear Medicine and Molecular Imaging Sciences	
MHP 651	Advanced Radiation Biology	3
NMT 698	Non-Thesis Research	6
NMT 699	Thesis Research	10
BST 603	Introductory Biostatistics for Graduate Biomedical Sciences	3
Total Hours		**24**

Courses

NMT 540. Physics in Biomedical Sciences. 3 Hours.
Physical concepts used in biology, human anatomy, physiology, as well as in medical diagnosis and treatment. Topics include mechanics, fluids, waves, heat, sound, optics, electricity & magnetism. Advanced topics include radiation, X-rays, MRI, and nuclear medicine.

NMT 601. Introduction to MRI Clinic. 2 Hours.
Overview of patient management, MRI screening and safety procedures, quality assurance procedures and FDA guidelines.

NMT 604. Introduction to Nuclear Medicine, Management, Patient Care & Lab. 2 Hours.
Overview of professional organizations and nuclear medicine; hospital organization; medical terminology; medical records; introduction to other aspects of nuclear medicine technology including management, communication skills, health law and medical ethics; basic patient care theory and techniques including standard precautions, infection control, vital signs, venipuncture, patient transfer techniques, immobilization techniques, aseptic and non-aseptic techniques, oxygen administration, and medical emergencies which are required for nuclear medicine students prior to entering clinical training.

NMT 605. Cross-Sectional Anatomy. 2 Hours.
Integration of the knowledge of gross anatomy with the identification and location of structures in cross-sectional images. Computed Tomography (CT) and Magnetic Resonance (MR).

NMT 611. Physics of Diagnostic Imaging for Radiation Safety Officer. 3 Hours.
Overview of the various imaging modalities used in a clinical setting. Topics include the basics of X-rays, ultrasound, CT, MRI, SPECT & PET imaging.
Prerequisites: MHP 602 [Min Grade: C] or MHP 610 [Min Grade: C] or NMT 620 [Min Grade: C]

NMT 620. Nuclear Medicine Physics, Instrumentation, and Lab. 4 Hours.
Principles and applications of nuclear medicine physics and instrumentation.
Prerequisites: MA 180 [Min Grade: C] and PH 201 [Min Grade: C] and PH 202 [Min Grade: C]

NMT 625. CT Physics and Instrumentation. 2 Hours.
Provide theoretical principles of Computed Tomography (CT); CT instrumentation, physics, data, acquisition, data processing and image quality.

NMT 631. Nuclear Medicine Anatomy & Physiology - Procedures I. 4 Hours.
Study of the utilization of nuclear medicine procedures including skeletal, respiratory, endocrine, gastrointestinal and genitourinary systems. Anatomy and relevant concepts in physiology are reviewed and applied to each procedure.
Prerequisites: NMT 601 [Min Grade: C]

NMT 632. Nuclear Medicine Anatomy & Physiology - Procedures II. 2 Hours.
Study of the utilization of nuclear medicine procedures including nuclear cardiology, oncology, central nervous and hematopoietic systems and applications of position emission tomography. Anatomy and relevant concepts in physiology are reviewed and applied to each procedure.
Prerequisites: NMT 631 [Min Grade: C]

NMT 633. Computed Tomography Procedures. 2 Hours.
Overview of CT positioning criteria, specific selections, and options in protocols. Understanding concepts in advanced CT including interventional imaging, positron emission tomography and special procedures.

NMT 634. MRI Scanning and Sequence. 2 Hours.
Overview of basic MRI theory; imaging sequences, parameter optimizations, and imaging procedures, flow imaging, and MR spectroscopy.
Prerequisites: NMT 624 [Min Grade: C]

NMT 641. Regulations, Radiation Protection/Biology and Lab. 4 Hours.
Overview of principles and methods of radiation protection, radiation biology and ionizing radiation regulations.

NMT 651. Radiation Safety Officer Advanced Radiation Biology. 3 Hours.
Effects of radiation at the molecular, cellular and whole-tissue level. Topics include cell survival curves, repair of radiation damage, radiation carcinogenesis, risk assessment models, cancer biology, model tumor systems, and dose fractionation in radiotherapy.
Prerequisites: NMT 641 [Min Grade: C]

NMT 653. Research Methodology and Publication Analysis. 2 Hours.
Perform scientific research, critically evaluate scientific literature, and write an abstract and scientific poster on a topic relevant to nuclear medicine.
Prerequisites: CDS 610 [Min Grade: C]

NMT 660. Radiopharmacy, Pharmacology & Lab. 4 Hours.
Overview of fundamentals of radiopharmacy and experiments including radionuclide generator design, elution and operation, labeling and quality control of Tc-99m labeled compounds, unit dose preparation; radiopharmaceutical design, IND process, MIRD, contrast media and pharmacology.

NMT 675. Special Topics in Nuclear Medicine Technology. 1-4 Hour.
Faculty-led exploration of current topics and issues in nuclear medicine technology.

NMT 691. NMT Clinical Practice. 3-9 Hours.
Directed clinical practice: in vivo procedures; instrumentation quality control; radiopharmacy; applied radiation safety procedures.

NMT 692. NMT and CT Clinical Practice. 7 Hours.
Clinical experience providing the opportunity to observe, work, and train to become a Nuclear Medicine Technologist in a clinical setting.
Prerequisites: NMT 691 [Min Grade: C]

NMT 693. Radiation Safety Officer Supervised Practice. 1-8 Hour.
Practical experience in Radiation Safety Practices. Practical experiences that students can engage in at UAB include research labs where radioisotopes are used, radiation oncology, nuclear medicine (imaging, therapy, and radiopharmacy), the molecular imaging center, the cyclotron facility, and occupational health & safety.
Prerequisites: NMT 620 [Min Grade: C]

NMT 694. Computed Tomography Clinical Practice. 1-10 Hour.
Directed clinical practice: CT instrumentation quality control; applied application of CT procedures.
Prerequisites: NMT 605 [Min Grade: C] and NMT 623 [Min Grade: C] and NMT 633 [Min Grade: C]

NMT 695. MRI Clinical Practice. 10 Hours.
Directed clinical practice: MRI instrumentation quality control; applied application of MRI procedures.
Prerequisites: NMT 602 [Min Grade: C] and NMT 605 [Min Grade: C] and NMT 624 [Min Grade: C] and NMT 634 [Min Grade: C]

NMT 696. Seminar and Registry Review. 2 Hours.
Ethics, healthcare disparities and costs associated with selected disease conditions; board exam review.

NMT 697. Journal Club in Nuclear Medicine and Molecular Imaging Sciences. 1 Hour.
Analysis of primary scientific literature in the field of nuclear medicine and molecular imaging sciences.

NMT 698. Non-Thesis Research. 1-10 Hour.
Directed research for a non-thesis master of science degree project.

NMT 699. Thesis Research. 1-10 Hour.
Original research in nuclear medicine technology and interpretation of results. Demonstrates student's acquaintance with literature of field and competency in proper selection and execution of research methodology.
Prerequisites: GAC M

Nutrition Sciences

The School of Health Professions Department of Nutrition Sciences offers the most comprehensive nutrition education experience you will find on one campus. Everything you need to learn to save lives, prevent disease, and improve quality of life can be found at UAB.

You can study the clinical side of nutrition in the heart of Alabama's top medical center, a dynamic academic campus environment surrounded by highly regarded medical facilities such as UAB Hospital, Birmingham VA Medical Center, and Children's of Alabama. The Department of Nutrition Sciences offers an undergraduate minor in Nutrition Sciences, a Bachelor of Science in Behavioral Nutrition and Wellness, a Master of Science in Nutrition Sciences (multiple tracks available), and a Doctor of Philosophy in Nutrition Sciences.

Master of Science Program in Nutrition Sciences (NS)

Degree Offered:	M.S.
Director:	Dr. Brenda Bertrand
Phone:	(205) 934-8770
E-mail:	brendamb@uab.edu
Web site:	https://www.uab.edu/shp/nutrition/

The MS in Nutrition Sciences provides experiences that foster understanding about nutrition research, health promotion, and disease prevention. Students choose from various track options as described below.

Admission to the Master of Science Program in Nutrition Sciences

The Nutrition Sciences graduate program recommends fall-term entry. Interested students must first obtain admission to the UAB Graduate School. Admission standards include:

1. Evidence of a bachelor's degree from a regionally accredited university or college in the United States or other majors with specified prerequisite courses;
2. Complete a criminal background check and drug screen at program admission and again prior to clinical placement as required by school policy for select tracks. Please check with the program for specific track requirements.

Additional requirement for the Clinical Track/Dietetic Internship Option only:

1. Evidence of a bachelor's degree from a Didactic Program approved by the Accreditation Council for Education in Nutrition and Dietetics (ACEND).

Additional requirement for the Clinical Track/Prior Learning Option only:

1. Verification statement from the Accreditation Council for Education in Nutrition and Dietetics (ACEND) demonstrating successful completion of a Dietetic Internship.

Degree Requirements

The MS in Nutrition Sciences requires successful completion of 14 semester hours in core courses, and additional specific courses for each of the tracks.

Core Requirements

Requirements		Hours
NTR 618	Nutritional Biochemistry	6
NTR 621	Applied Statistics to Nutrition Sciences I	3
NTR 637	Applied Research in Nutrition Sciences	3
NTR 690	Seminar	2
Total Hours		**14**

Additional Information

Deadline for Entry Term(s):	Fall (June 1), Spring (Oct 1), and Summer (March 1) admission available for Lifestyle Management Disease Prevention Track and Clinical Track/Prior Learning Option)
	Fall - DEP-C Track Jan 3; DEP Track May 15, Research Track Feb 1; Clinical/Dietetic Internship Track June 1
Number of Evaluation Forms Required:	Three
Entrance Tests:	TOEFL, IELTS, PTEA, Duolingo, or IELA is required for all international applicants whose native language is not English for applicable tracks

For detailed information, contact:

Dr. Brenda Bertrand, Professor and MS in Nutrition Sciences Program Director

UAB School of Health Professions

Webb Building, Room 534, 1675 University Boulevard, Birmingham, AL 35294-3360

Telephone: 205-934-8770

E-mail: brendamb@uab.edu (miller1@uab.edu)

Website: https://www.uab.edu/shp/nutrition/

Master of Science in Nutrition Sciences-Clinical Track/Dietetic Internship

Students in the MS in Nutrition Sciences Clinical Track/Dietetic Internship must complete 48 semester hours of graduate-level coursework (14 semester hours in core courses and 34 semester hours of required track courses). Students are required to complete 1,000 contact hours of supervised professional practice in nutrition and dietetics (NTR 589).
This is a non-thesis track. All non-practicum course work is offered online. Fall term admission only. Only students who have completed a bachelor's degree from a didactic program approved by ACEND are eligible to apply.

Requirements		Hours
NTR 500	Communications in Nutrition	1
NTR 501	RDN Certification Review	0
NTR 601	Advanced Medical Nutrition	3
NTR 604	Principles and Practice of Nutrition Support	3
NTR 611	Advanced Food System and Resource Management	3
Internship/Practicum		**24**
NTR 589	Internship Practicum	
Total Hours		**34**

Clinical Track/Dietetic Internship Accreditation

The Clinical Track / Dietetic Internship is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) and is designed to prepare entry-level dietitians for careers in a variety of health care, wellness, and community settings. Admission to this track is awarded on a competitive basis through the Dietetic Internship Centralized Application Service (DICAS) portal. Upon acceptance into the Dietetic Internship, you must then apply to be admitted to the UAB Graduate School.

An onsite internship is offered in Birmingham, and offsite in Huntsville, Mobile, and Montgomery. Upon completion of the program, graduates are eligible to take the national examination to become a Registered Dietitian Nutritionist (RDN).

Additional Information

Requirement	Fulfilled By:
Entry Term(s)	Fall
Deadline for DICAS and D&D Digital:	February 15
Deadline for ALL Application Materials to be in the Graduate School Office:	June 1

For detailed information, contact:

Dr. Keith Pearson, Assistant Professor and Director, Clinical Track/Dietetic Internship

Department of Nutrition Sciences, UAB School of Health Professions

Webb Building, Room 603, 1675 University Boulevard, Birmingham, AL 35294-3360

E-mail: pearson2@uab.edu

Website: www.uab.edu/shp/nutrition/education/masters/clinical-track-dietetic-internship

Master of Science in Nutrition Sciences-Clinical Track/Dietetic Internship/MPH Dual Degree

Students in the Dietetic Internship/MPH Dual Degree option must complete 30 semester hours of graduate-level coursework, comprising 27 hours of public health courses and 3 semester hours of NTR 589 to be applied to the MPH degree, in addition to the requirements of the MS in Nutrition Sciences Clinical Track/Dietetic Internship program described above. All required public health coursework is offered online.

Only students who are enrolled in the MS in Nutrition Sciences Clinical Track /Dietetic Internship are eligible to apply for the dual degree option.

Requirements		Hours
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
PUH 610	Population Health	3
ENH 690	Environmental Health Perspectives	1
Select one of the following courses		2
ENH 689	Environmental Health Sciences Integrative Learning Experience	
EPI 689	Epidemiology Integrative Learning Experience	
HB 689	Health Behavior Integrative Learning Experience	
NTR 589	Internship Practicum	3
MPH Elective Courses		7
Total Hours		**30**

For further information about the MPH component of the dual degrees, contact:

Meghan Walker Program Manager, Population Health & Coordinated Degree Programs

University of Alabama at Birmingham School of Public Health

1720 2 nd Avenue South, 130 Ryals Public Health Building, Birmingham AL 35294-0022

Telephone: 205-934-2684

E-mail: mewalker (mewalker@uab.edu)@uab.edu

Website: https://www.uab.edu/soph/home/graduate/programs/mph-ms

Master of Science in Nutrition Sciences-Lifestyle Management and Disease Prevention Track

Students in the MS in Nutrition Sciences Lifestyle Management and Disease Prevention Track must complete 36 semester hours of graduate-level coursework (14 semester hours in core courses, 19 semester hours of required courses, and 3 semester hours of graduate-level elective coursework). This is a non-thesis track and all coursework is offered online. Prerequisite requirements include successful completion (with a grade of C or higher) in undergraduate courses, in the following subject areas (3 semester hours each): Introductory Nutrition, Biology, Organic Chemistry, Physiology, and Microbiology.

Requirements		Hours
NTR 609	Applied Nutrition for Physical Activity and Disease Prevention	3
NTR 631	Community Interventions for Healthy Lifestyles	3
NTR 632	Nutrition Counseling and Education	4
KIN 644	Application of Exercise Physiology to Fitness and Performance	3
CDS 605	Survival Spanish for Health Professionals	1
GC 545	Genetics and Genomics Applications in Health Care	2
PA 550	Introduction to Medical History Taking and Physical Examination	3

Elective	3
Total Hours	**22**

Master of Science in Nutrition Sciences-Dietitian Education Program Track

The Dietitian Education Program (DEP) is a Coordinated Program in Dietetics as defined by the Accreditation Council for Education in Nutrition and Dietetics of the Academy of Nutrition and Dietetics. Upon completion of the program, graduates are eligible to take the national examination to become a Registered Dietitian Nutritionist (RDN). There are two program options for the DEP, which include the **DEP Track** and the **DEP Graduate Certificate** of the Lifestyle Management and Disease Prevention Track. Enrollment in each of the tracks is dependent on pre-requisite requirements.

Prerequisite requirements for the **DEP Track** include successful completion (with a grade of C or higher) in undergraduate courses in the following subject areas (three semester hours each): Introductory Nutrition, Biology, Organic Chemistry, Physiology, and Microbiology and completion of the following undergraduate nutrition courses: NTR 222 Nutrition and Health, NTR 232 Lifecycle Nutrition, NTR 320 Nutrition and the Consumer, NTR 330 Nutrition and Metabolism, NTR 420 Nutritional Genetics, and NTR 421 Nutrition Assessment and the Nutrition Care Process.

Only students who are enrolled in the Lifestyle Management and Disease Prevention Track are eligible for the **DEP Graduate Certificate** program.

Students in the Dietitian Education Program must complete 58 hours of graduate-level coursework (14 semester hours in core courses and 44 semester hours of required track courses). Students are required to compete 1,000 contact hours of supervised professional practice in nutrition and dietetics (NTR 670 – 676). This is a non-thesis track and all non-practicum coursework is offered online. Fall term admission only. Students can elect to complete practicum experiences in the Birmingham area, or remotely in their preferred location.

Dietitian Education Program Accreditation

The Dietitian Education Program is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND).

Requirements		Hours
NTR 500	Communications in Nutrition	1
NTR 501	RDN Certification Review	0
NTR 600	Principles of Food Science Operations and Menu Planning	3
NTR 601	Advanced Medical Nutrition	3
NTR 604	Principles and Practice of Nutrition Support	3
NTR 611	Advanced Food System and Resource Management	3
NTR 631	Community Interventions for Healthy Lifestyles	3
NTR 632	Nutrition Counseling and Education	4
NTR 670	Practicum in Wellness	3
NTR 671	Practicum in Community Nutrition	3
NTR 672	Practicum in Food Systems Management	3
NTR 673	Practicum in Medical Nutrition Therapy I	3
NTR 674	Practicum in Medical Nutrition Therapy II	4
NTR 675	Practicum in Dietetic Administration	4
NTR 676	Advanced Practicum in Dietetics	4
Total Hours		**44**

For detailed information, contact

Dr. Lizzy Davis, Assistant Professor and Director, DEP Track

Department of Nutrition Sciences, UAB School of Health Professions,

Webb Building, Room 550, 1675 University Blvd., Birmingham, AL 35294

Telephone 205-935-6514

E-Mail kroeger@uab.edu
Web https://www.uab.edu/shp/nutrition/education/masters/dietitian-education-track

Master of Science in Nutrition Sciences-Clinical Track/Prior Learning Option

Students in the MS in Nutrition Sciences Clinical Track/Prior Learning Option must complete 30 semester hours of graduate-level coursework (14 semester hours in core courses, 10 semester hours of required track courses, and 6 semester hours of elective credits). Only students who have a Verification Statement demonstrating successful completion of a Dietetic Internship (DI) or a Coordinated Program (CP) accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) are eligible to apply. This is a non-thesis track and all required coursework is offered online.

Requirements		Hours
NTR 500	Communications in Nutrition	1
NTR 601	Advanced Medical Nutrition	3
NTR 604	Principles and Practice of Nutrition Support	3
NTR 611	Advanced Food System and Resource Management	3
Electives		6
Total Hours		**16**

Master of Science in Nutrition Sciences-Research Track

Students in the MS in Nutrition Sciences Research Track must complete 37 semester hours of graduate-level coursework (14 semester hours in core courses, 20 semester hours of required track courses, and 3 semester hours of elective credits). Students in the Research Track are required to complete and orally defend thesis research that contributes to the growing body of knowledge of nutrition sciences (NTR 698 and NTR 699). Most non-research coursework is offered online.

Requirements		Hours
NTR 623	Applied Statistics to Nutrition Sciences II	3
NTR 636	Scientific Methods	3
NTR 698	Master s Level Non-Thesis Research	2
NTR 699	Master's Level Thesis Research	6
NTR 733	Laboratory Instruments and Methods in Nutrition Research	1
GRD 717	Principles of Scientific Integrity	3
Elective		3
Seminar		**2**
NTR 788	Advanced Nutrition Seminar	
Total Hours		**23**

Ph.D. Program in Nutrition Sciences (NS)

Degree Offered:	Ph.D.
Director:	Dr. Paula Chandler-Laney
Phone:	(205) 934-0809
E-mail:	pchandle@uab.edu
Web site:	www.uab.edu/nutrition

The program leading to the Ph.D. in Nutrition Sciences at UAB is designed to provide coursework and research experience that emphasizes the science of nutrition in maintaining the health of individuals and populations and preventing a variety of diseases. The doctoral program combines required and elective didactic coursework in basic sciences and nutrition with research incorporating basic science, clinical applications, and translational research conducted in superb facilities in an outstanding research environment.

Admission for PhD in Nutrition Sciences

To meet Graduate School and departmental standards for admission into the PhD in Nutrition Sciences, a student must have an undergraduate degree with a science background, three letters of recommendation based on thorough knowledge of the applicant's background and abilities, and, of great importance, a statement of goals and purpose that delineates the student's motivation and purpose in seeking this degree. Application deadline is December 1.

Coursework and Other Requirements

Successful completion of the Ph.D. will require completion of a minimum of 14 semester hours in core courses (encompassing the disciplines of biochemistry, nutritional biochemistry, statistics, and experimental design) and at least 46 additional graduate semester hours of required and 12 semester hours of elective coursework from nutrition and other disciplines; passing a comprehensive written and oral qualifying examination; and defense of a dissertation reporting the results of original scientific research that makes a genuine contribution to the knowledge of nutrition sciences. In fulfilling the latter requirement, with rare exceptions, the student must include papers that are publishable in peer-reviewed journals, with one paper for which the student is the first author. In addition, the student must have published two manuscripts in peer-reviewed journals, one for which the student is the first author, prior to defending their dissertation.

Additional Information

For detailed information, contact Dr. Paula Chandler-Laney, Director of the Ph.D. Program in Nutrition Sciences, Department of Nutrition Sciences, UAB School of Health Professions, Susan Mott Webb Nutrition Sciences Building, Room 413, 1675 University Boulevard, Birmingham, AL 35294-3360.

Telephone 205-975-3006
E-mail nutrition@uab.edu (phdntr@uab.edu)
Web www.uab.edu/nutrition

Core Classes must include:

Requirements		Hours
Core Courses:		
NTR 621	Applied Statistics to Nutrition Sciences I	3
NTR 637	Applied Research in Nutrition Sciences	3
NTR 690	Seminar	2
NTR 618	Nutritional Biochemistry	6
Required Courses:		
GRD 717	Principles of Scientific Integrity	3
NTR 733	Laboratory Instruments and Methods in Nutrition Research	2
NTR 736	Scientific Methods	3
NTR 747	Molecular Biology and Nutrition Sciences	3
NTR 779	Obesity in the 21st Century	3
NTR 788	Advanced Nutrition Seminar (Required each Fall and Spring semester for a total of 5 credits)	1
Total Hours		**29**

Elective classes:

Requirements		Hours
Select 12 credit hours of elective coursework		
NTR 601	Advanced Medical Nutrition	3
NTR 604	Principles and Practice of Nutrition Support	3
NTR 609	Applied Nutrition for Physical Activity and Disease Prevention	3
NTR 631	Community Interventions for Healthy Lifestyles	3
NTR 632	Nutrition Counseling and Education	4
NTR 750	Body Composition and Energy Metabolism	3
NTR 755	Teaching Practicum in Nutrition Sciences	3
NTR 761	Enhancing Research Productivity Through Intensive Writing	3
NTR 769	Race, Nutrition and Health	3

Graduate Certificate in Nutrition for Community Health

Requirements		Hours
NTR 632	Nutrition Counseling and Education	4
NTR 631	Community Interventions for Healthy Lifestyles	3
NTR 618	Nutritional Biochemistry	6
NTR 609	Applied Nutrition for Physical Activity and Disease Prevention	3
Total Hours		**16**

Courses

NTR 500. Communications in Nutrition. 1 Hour.
This course is designed to enable students to communicate effectively with the public via blogs, media interviews, traditional written education materials, social media, and websites. Emphasis in all of these areas of communication will be on translating scientific evidence into accurate and engaging communications for consumers and the press.

NTR 501. RDN Certification Review. 0 Hours.
Sponsored workshop to prepare students for the Registered Dietitian Nutritionist examination.

NTR 521. Nutrition Assessment and the Nutrition Care Process. 3 Hours.
Introduction to the Nutrition Care Process (NCP), a systematic approach to providing high-quality nutrition care. The NCP provides a framework for critical thinking and decision making. Gain factual knowledge, learn to apply course material through case study application, and explore fundamental principles in medical nutrition related content areas.
Prerequisites: NTR 222 [Min Grade: C]

NTR 589. Internship Practicum. 1-12 Hour.
Clinical experience in food service management and nutritional care in facilities throughout community; specific objectives vary depending on rotation.

NTR 600. Principles of Food Science Operations and Menu Planning. 3 Hours.
Practice Management and Use of Resources: strategic application of principles of management and systems in the provision of food services to individuals and organizations.

NTR 601. Advanced Medical Nutrition. 3 Hours.
Roles of nutrition in relationship to health; prevention of disease and correction of disorders due to nutritional imbalance throughout life cycle; disease states and their nutritional management; biochemical, clinical, and dietary assessment of nutritional status; drug-nutrient interactions; inborn errors of metabolism.

NTR 604. Principles and Practice of Nutrition Support. 3 Hours.
Critical review of current methods of providing nutrition support for critically ill patients; theory integrated with clinical practice.

NTR 609. Applied Nutrition for Physical Activity and Disease Prevention. 3 Hours.
Theoretical and applied aspects of nutrition for sport performance and health promotion. Provides practical application of evidence-based analysis of topics to promote consumer health.

NTR 611. Advanced Food System and Resource Management. 3 Hours.
Management systems and their application to hospital food service; legal aspects of dietetic practice; quality assurance, departmental planning, and organization.

NTR 617. Herbs and Spices in Nutrition Sciences. 3 Hours.
Herbs and spices have been components of human diets via culinary traditions for thousands of years. This course will focus on approximately two dozen popular herbs and spices, considering bioactive ingredients and proposed mechanisms of action for nutrition- and health-focused outcomes. Evidence-based evaluations of health and wellness claims will be considered from the published literature, alongside the purported dietary and culinary benefits of herb and spice use.

NTR 618. Nutritional Biochemistry. 6 Hours.
Metabolism and function of nutrients; biosynthesis of vitamins and their cofactors; human requirements for energy, amino acids, minerals, and vitamins; current human nutritional problems.

NTR 621. Applied Statistics to Nutrition Sciences I. 3 Hours.
This course has been designed to introduce students to statistical methods and approaches used to test hypotheses in the field of nutrition. Students will learn statistical tools that will equip them to analyze data, and will apply their knowledge to data sets addressing scientific questions related to nutrition and the application of nutrition to health.

NTR 623. Applied Statistics to Nutrition Sciences II. 3 Hours.
This course has been designed to expose students to advanced statistical methods and approaches used to test hypotheses in the field of nutrition. Students will learn statistical tools that will include longitudinal data, clustering methods, and treatment of covariates in statistical analyses. The course will equip students to analyze data, and will apply their knowledge to data sets addressing scientific questions related to nutrition and the application of nutrition to health.
Prerequisites: NTR 621 [Min Grade: C]

NTR 625. Human Nutr Through the Life Cy. 3 Hours.
This course will examine the role of nutrition and dietary factors on the growth, development, and maintenance of health throughout the human life cycle. Nutritional guidelines/recommendations, special nutritional needs, physiology, and nutritional health concerns for each stage of the human lifecycle beginning with preconception and continuing throughout adulthood and aging will be addressed.

NTR 626. Consumer Issues in Nutrition. 3 Hours.
This course examines contemporary nutritional issues that affect consumers. Focus will be on the translation of science to public policy, consumer communications, and food choices.

NTR 630. Maternal Child Hlth Ped Nutrit. 4 Hours.
Public health and interdisciplinary approach to pediatric and maternal and child nutrition; translation of evidence based approaches to pediatric nutrition, including prevention and intervention.

NTR 631. Community Interventions for Healthy Lifestyles. 3 Hours.
Community-based strategies for promoting healthy lifestyles through improved eating and physical activity behaviors; emphasis on childhood obesity prevention and intervention; integration of the Life Course model.

NTR 632. Nutrition Counseling and Education. 4 Hours.
Theoretical and applied aspects of nutrition counseling and education. Practical application of counseling strategies to promote consumer health.

NTR 636. Scientific Methods. 3 Hours.
Approaches for nutrition investigation; design of experiments and research proposals.

NTR 637. Applied Research in Nutrition Sciences. 3 Hours.
Introduction to research methodologies and application of research related to nutrition and dietetics using practical application of qualitative and quantitative research and evaluation methods in community and health-related settings.
Prerequisites: NTR 621 [Min Grade: C]

NTR 650. Body Composition and Energy Metabolism. 3 Hours.
Methods of measurement of body composition and energy expenditure and their relationship to health and disease.

NTR 666. Nutrition, Mindfulness, and Wellness. 3 Hours.
Exploration of relationship between dietary practices and health; guide to design of individualized health lifestyle practices, including meditation and mindfulness.

NTR 670. Practicum in Wellness. 3 Hours.
This course is designed to give students practical experiences to meet nutrition and wellness needs in a variety of populations. Students will complete wellness activities in campus dining, corporate, healthcare, and school sites. These activities will include developing wellness messages for social media, investigating new wellness and nutrition trends, and practicing counseling/ health coaching skills leading to health behavior change.

NTR 671. Practicum in Community Nutrition. 3 Hours.
Students will apply strategies to meet nutrition needs outside of the acute-care setting with emphasis on cultural competency, effective communication, nutrition education, public policy, program planning and food assistance programs.

NTR 672. Practicum in Food Systems Management. 3 Hours.
This practicum provides supervised experiences that will help students explore issues and topics to develop the skills necessary to manage foodservice systems, including production, inventory control, sanitation and quality management. Emphasis on applications to healthcare facilities.

NTR 673. Practicum in Medical Nutrition Therapy I. 3 Hours.
Students will round with the dietitian to gain competence in the Nutrition Care Process in long-term, in-patient, and out-patient hospital or clinic setting. Students also prepare and present case study reports to become skillful in investigating and discussing these disease states and conditions in professional settings. Students use a clinical log to track the populations they are serving and the disease states and conditions they are treating during this practicum.

NTR 674. Practicum in Medical Nutrition Therapy II. 4 Hours.
Students will work, under the supervision of registered dietitians, in local hospitals (acute care, out-patient) and long-term medical care facilities to assess, diagnose, chart and plan Medical Nutrition Therapy. Students will practice the skills developed in Practicum in Medical Nutrition Therapy I.

NTR 675. Practicum in Dietetic Administration. 4 Hours.
This practicum focuses on the application of management and leadership principles and techniques specific to the provision of nutrition services in foodservice. Students practice the care and operation of equipment, sanitation audits, HACCP Guidelines, budget planning and customer service.

NTR 676. Advanced Practicum in Dietetics. 4 Hours.
This course provides the opportunity for the student to work independently under the supervision of a registered dietitian. The student will demonstrate competence at an entry-level before beginning this experience.

NTR 680. Journal Club in Clinical Nutrition. 1 Hour.
Review, discussion, and critique of current literature in clinical nutrition.

NTR 690. Seminar. 2 Hours.
Review of current literature and research in nutrition.

NTR 691. Clinical Practicum: Nutritional Aspects of Children with Intellectual Disabilities. 1-6 Hour.
Evaluation of nutritional status, feeding behavior, and food habits of children with intellectual disabilities; nutritional care; functioning in interdisciplinary team; field trips to agencies serving children with intellectual disabilities.

NTR 692. Clinical Practicum: Community Nutrition. 1-6 Hour.
Clinical experiences in health care delivery systems with nutrition components; methods of determining nutritional status of most vulnerable groups; nutrition education of community; current community nutrition issues; food fads, weight control, food misinformation, and nutrition legislation.

NTR 693. Clinical Practicum: Pediatric Nutrition. 1-6 Hour.
Clinical experiences in normal growth patterns in children; nutritional needs in health and disease; medical problems of pediatric patients; diet therapy.

NTR 694. Clinical Practicum: General Clinical Research. 1-6 Hour.
Clinical experiences in a multi-disciplinary research facility involving human subjects.

NTR 695. Special Topics in Nutrition. 1-4 Hour.
Exploration of current issues in Nutrition Sciences.

NTR 696. Clinical Practicum: Nutr Support of Pediatric Clin. 1-6 Hour.
Observation of and participation in interdisciplinary team delivery of health care to pediatric patients with pulmonary disease; variety of settings utilized, including neonatal intensive care, medical/surgical pediatric acute care, and pediatric pulmonary clinics; emphasis on optimizing nutritional support to pediatric patients with pulmonary dysfunction.

NTR 697. Clinical Practicum: Nutrition Support Service. 3-6 Hours.
Observation of and participation in interdisciplinary team delivery of nutrition support to critically ill hospitalized patients and ambulatory patients.

NTR 698. Master s Level Non-Thesis Research. 1-6 Hour.
Project designed to meet student's particular interest in nutrition and dietetic field; review of current literature; limited research and paper required.

NTR 699. Master's Level Thesis Research. 1-9 Hour.
Projects designed individually to meet student's particular interest within nutrition and dietetic field; emphasis on research approach to problem solving, including review of current literature in topic area.
Prerequisites: GAC M

NTR 701. Advanced Medical Nutrition. 3 Hours.
Role of nutrition and its relationship to health, prevention of disease, and correction of disorders due to nutritional imbalance throughout the life cycle. Emphasis on nutrition assessment and current research, including biochemical clinical, dietary, and anthropometric measurements.

NTR 718. Nutritional Biochemistry. 6 Hours.
Metabolism and function of nutrients; biosynthesis of vitamins and their cofactors; human requirements for energy, amino acids, minerals, and vitamins; current human nutritional problems.

NTR 723. Assessment of Nutritional Status in Populations. 3 Hours.
Theoretical and hands-on instruction in methods of assessment of dietary intakes, body composition, and biochemical levels of macro- and micronutrients. Proper techniques for collecting measurements and review of computer software packages that specialize in analysis of specific measurements.

NTR 728. Cancer Prevention and Control Seminar. 1-3 Hour.
Presentations related to cancer prevention and control and participation on cancer research review boards. Required for pre- and post-doctoral fellows in the NCI-supported R25 Cancer Prevention and Control Training Program.

NTR 733. Laboratory Instruments and Methods in Nutrition Research. 1-5 Hour.
Instruction in theory and use of selected laboratory instruments (selected according to student's need related to research project).

NTR 736. Scientific Methods. 3 Hours.
This course is designed to provide the students with the knowledge necessary to plan, design, and undertake research on topics related to nutrition science.

NTR 747. Molecular Biology and Nutrition Sciences. 3 Hours.
Overview of molecular biology applications in nutrition science research. Examination of basic molecular biology techniques, current usage of molecular biology to solve nutrition problems, and application of biotechnology to study disorders with nutritional component.

NTR 750. Body Composition and Energy Metabolism. 3 Hours.
Methods of measurement of body composition and energy expenditure and their relationship to health and disease.

NTR 755. Teaching Practicum in Nutrition Sciences. 3 Hours.
Students will apply the concepts that they learned from the graduate teaching certificate program of UAB Center for the Integration of Research, Teaching and Learning (CIRTL) to formal teaching instruction. Students will serve as co-teachers, working with a Nutrition Science faculty course-master to participate in teaching activities of a specified course.

NTR 760. Foundations of Nutrition Research. 1 Hour.

NTR 761. Enhancing Research Productivity Through Intensive Writing. 3 Hours.
Instruction and practice in techniques for developing publishable manuscripts, including establishing consistent and sustainable writing habits, improving the quality of writing, seeking and incorporating feedback from mentors and co-authors, identifying appropriate statistical approaches for research questions, and responding to reviewers/editors comments for revision or rejection.

NTR 769. Race, Nutrition and Health. 3 Hours.
Introduction to the identification, measurement and exploration of etiological factors that underlie racial/ethnical disparities in health outcomes.

NTR 778. Special Topics in Nutrition Sciences. 1-5 Hour.
Special topics in Nutrition Sciences.

NTR 779. Obesity in the 21st Century. 3 Hours.
General overview of the facts and research findings underlying the understanding of obesity, its co morbidities, and its consequences in the population.

NTR 788. Advanced Nutrition Seminar. 1 Hour.

NTR 798. Doctoral Level Non-Dissertation Research. 1-15 Hour.

NTR 799. Doctoral Level Dissertation Research. 1-15 Hour.
Prerequisites: GAC Z

Occupational Therapy

The Department of Occupational Therapy currently offers an Occupational Therapy Clinical Doctorate (OTD - entry-level and post-professional tracks), and a graduate certificate in Low Vision Rehabilitation (LVR). The LVR graduate certificate may be completed independently by practicing occupational therapists, or in conjunction with the OTD degree.

Degree Offered:	Occupational Therapy Clinical Doctorate (OTD)
Directors:	Dr. Jewell Dickson (Entry-level) and Dr. Sarah Tucker (Post-professional)
Phone:	(205) 934-7326
Website:	http://www.uab.edu/shp/otd

Degree Offered:	Low Vision Rehabilitation Graduate Certificate
Director:	Dr. Beth Barstow
Phone:	(205) 934-7321
Website:	http://www.uab.edu/shp/ot/low-vision-rehabilitation

Degree Offered:	Multi-Tiered Approach to Trauma Graduate Certificate
Director:	Mrs. Rachel Ashcraft
Phone:	(205) 934-1044
Website:	https://www.uab.edu/shp/ot/post-professional/multitiered-approach-to-trauma

Low Vision Rehabilitation Graduate Certificate

The Graduate Certificate in Low Vision Rehabilitation is a practice oriented certificate program that prepares occupational therapists to provide comprehensive, competent intervention to adults with visual impairment from age-related eye diseases or brain injury. The program is designed for occupational therapists already working in low vision rehabilitation; those interested in starting low vision rehabilitation programs; and those interested in expanding their practice skills in this area. The program's flexible web-based distance format allows occupational therapists across the United States and other English speaking countries to obtain these skills while working full time.

Credentials Conferred

The Graduate Certificate in Low Vision Rehabilitation is awarded by the University of Alabama at Birmingham.

Length of Study

The certificate requires 5 semesters to complete; students take 1 course per semester.

Program Entrance Date

Fall semester (begins in August)

Requirements for Admission

Degree in occupational therapy from an accredited university program.

Essential Requirements

After acceptance and prior to enrollment into online programs, students must certify their ability to complete the essential tasks, with or without reasonable accommodation, associated with performing as an occupational therapy student. Reasonable accommodation refers to ways in which the University can assist students with disabilities to accomplish these tasks (for example, providing extra time to complete an examination). Reasonable accommodation does not mean that students with disabilities will be exempt from certain tasks; it does mean that the Department of Occupational Therapy will work with students with disabilities to determine whether there are ways to assist the student with completion of the required tasks.

After enrollment, a student with a disability who wishes reasonable accommodation contacts Disability Support Services (205) 934-4205 or (205) 934-4248 (TDD), provides appropriate and current documentation substantiating the claimed disability, meets the requirements of a disability as described in the ADA, and identifies the needed accommodation. Reasonable accommodation in classroom and in practice settings cannot be provided without the formal request and the required documentation of the ADA defined disability. (Visit http://www.uab.edu/students/disability).

Essential Tasks

- Students must meet class standards for course completion throughout the curriculum.
- Students must be able to read, write, speak, and understand English at a level consistent with successful course completion and development of positive client-therapist relationships.
- Students must complete readings, assignments, and other activities.
- Students must gather decision-making pieces of information during client assessment activities.
- Students must perform evaluation and intervention activities by direct performance keys.
- Students must apply critical thinking processes to their work in the courses.
- Students must have interpersonal skills as needed for productive discussion, respectful interaction with classmates and faculty.
- Students must demonstrate appropriate health status prior to enrollment with annual updates on some items. Requirements are found at www.uab.edu/studenthealth.
- Students must follow standards and policies specified in the Department of Occupational Therapy Student Handbook, and the University of Alabama at Birmingham *Directions* Handbook.
- Students must adhere to all policies outlined in the Department of Occupational Therapy Student Handbook which is posted online at www.uab.edu/shp/ot/contact-us/student-resources.

Application Deadline and Procedure

See Occupational Therapy Low Vision Rehabilitation Admissions Checklist on the Overview page.

International Students:

See Occupational Therapy Low Vision Rehabilitation Admissions Checklist, in addition to the following items:

- A transcript evaluation from World Education Services (www.wes.org) or Educational Credential Evaluators (www.ece.org) may be required.
- Students from countries where English is not the official and primary language may be required to take and receive an acceptable score on the TOEFL, or the IELTS.
- Submit official TOEFL test score (Institution code: 1856) or official IELTS score (provide the Graduate School's mailing address to the testing company/center).

Typical Program (Course requirements are listed in semester credit hours)

The curriculum is designed with the working occupational therapist in mind. Coursework emphasizes practical application to the clinic. Projects are designed to reinforce learning of application to practice. Materials for completion of the courses can be obtained through the internet and required texts. The student must have consistent access to the internet. A high-speed connection (DSL, cable, satellite) is strongly recommended.

Certificate

On completion of the required coursework the student will be awarded a Graduate Certificate in Low Vision Rehabilitation by the University of Alabama at Birmingham and the student's name will appear in the commencement bulletin. A transcript of the coursework taken for the certificate will be available.

The curriculum for the certificate is offered online as web-based distance education for practitioners. Students accepted into the program begin the curriculum in August and complete one course per semester. Because one course builds on another, students must take the courses in sequence. The final course requires that the student come to the UAB campus for a 2-day on campus intensive where they will work in small groups with instructors to demonstrate assessment and intervention skills. This is the only time the student is required to come to the UAB campus during the entire curriculum. Travel to UAB for the intensive weekend may be waived under special circumstances. Examples include limitations in travel due to disability, illness, or travel from outside the U.S. A series of online meetings will be substituted. Travel exceptions are at the discretion of the Low Vision Rehabilitation Program Director. Based on these requirements, course work for completion of the certificate will require 5 semesters.

LOW VISION REHABILITATION CURRICULUM

The courses must be completed sequentially in the order listed below.

Typical OT Curriculum Course Sequence

Requirements		Hours
Fall Cohort		
OT 677	Foundations in Low Vision Rehabilitation I (1st Fall semester)	3
OT 679	Foundations in Low Vision Rehabilitation II (1st Spring semester)	3
1st Summer semester Open		
OT 690	Foundations in Low Vision Rehabilitation III (2nd Fall semester)	3
OT 689	Foundations in Treatment of Visual Impairment from Brain Injury (2nd Spring semester)	3
OT 691	Foundations in Low Vision Rehabilitation IV (2nd Summer semester)	3
Total Credits 15 credits		

For further information contact:

Program Coordinator
Occupational Therapy Low Vision Rehabilitation Certificate Program
UAB School of Health Professions
SHPB 352
1716 9th Avenue South
Birmingham, AL 35294-1212
Telephone 205-934-3569
E-mail **lvrcert@uab.edu**
Web http://www.uab.edu/shp/ot/low-vision-rehabilitation

Multi-Tiered Approach to Trauma Graduate Certificate

The Graduate Certificate in Multi-Tiered Approach to Trauma is a certificate program that prepares professional to implement trauma-informed practices and policies within the professional practice.

Credentials Conferred

The Graduate Certificate in Multi-Tiered Approach to Trauma is awarded by the University of Alabama at Birmingham.

Length of Study

The certificate is an online, five-course program.

Program Entrance Date

Fall semester (August start)

Requirements for Admission

Applicants must have a baccalaureate degree.

Multi-Tiered Approach to Trauma

Requirements		Hours
OTC 601	Individual Impact of Trauma Across the Lifespan (Fall) [1]	3
OTC 603	Trauma and Context Specific Considerations (Spring) [2]	3
OTC 605	Historical Trauma (Summer) [3]	3
OTC 610	Systems Assessment using Trauma Lens (Fall) [1]	3
OTC 615	Trauma Responsive Program Design (Spring) [2]	3
Total Hours		**15**

[1] Offered fall terms
[2] Offered spring terms
[3] Offered summer terms

For further information contact:

Program Coordinator
Multi-Tiered Approach to Trauma Certificate Program
UAB School of Health Professions
SHPB 353
1716 9th Avenue South
Birmingham, AL 35294-1212
Telephone 205-934-1044
E-mail **rar82@uab.edu**
Web Multi-Tiered Approach to Trauma

Clinical Doctorate in Occupational Therapy

The Clinical Doctorate in Occupational Therapy (OTD) prepares graduates with in-depth knowledge in a specific area such as professional practice, advocacy, policy, education, research and program development. Doctoral students actively engage in educational and clinical experiences to develop the capacity to drive change across professional and community based practice. Students develop advanced knowledge and practice skills to assess occupational needs; identify barriers to occupational engagement and devise strategies that support full occupational participation to improve the health and well-being of people, populations, and communities. The degree is offered as either:

1. Entry-Level OTD – The entry level, or professional track, is a full-time program designed for those interested in obtaining an occupational therapy degree. The graduates of this track are eligible to sit for the national occupational therapist certification examination administered by the National Board for Certification in Occupational Therapy (NBCOT®): website: www.nbcot.org.
2. Post-professional OTD – The post-professional track is a flexible web-based format that allows occupational therapists across the United States, and in other countries, to obtain this advanced practice degree while working full time. The post-professional track is for experienced occupational therapy professionals.

Entry-Level OTD Program Accreditation

The entry-level occupational therapy doctoral degree program is accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA), located at 6116 Executive Boulevard, Suite 200, North Bethesda, MD 20852-4929. ACOTE's telephone number c/o AOTA is (301) 652-AOTA and its web address is www.acoteonline.org. Graduates of the program will be eligible to sit for the national certification examination for the occupational therapist administered by the National Board for Certification in Occupational Therapy (NBCOT). After successful completion of this exam, the individual will be an Occupational Therapist, Registered (OTR). In addition, all states require licensure in order to practice; however, state licenses are usually based on the results of the NBCOT Certification Examination. Note that a felony conviction may affect a graduate's ability to sit for the NBCOT certification examination or attain state licensure.

Students must complete 24 weeks of Level II fieldwork as well as an individual 14-week capstone experience within 12 months following the completion of the didactic portion of the program. The doctoral capstone experience must be started after completion of all coursework and Level II fieldwork as well as completion of preparatory activities defined in 2018 ACOTE OTD Standard D.1.3.

Credentials Conferred

The Clinical Doctorate in Occupational Therapy (OTD) degree is awarded by the University of Alabama at Birmingham.

Professional Certification

Graduates of the entry level OTD program will be eligible to sit for the national occupational therapist certification examination administered by the National Board for Certification in Occupational Therapy (NBCOT)®; website: www.nbcot.org. After successful completion of the examination, the individual will be an Occupational Therapist, Registered (OTR). Most states require licensure in order to practice; however, state licenses are usually based on the results of the NBCOT Certification Examination.

Applicants should be aware that fieldwork/capstone placement sites, professional licensing agencies and prospective employers frequently require criminal history disclosures and background checks, although convictions do not necessarily disqualify someone for licensure or employment. Applicants with criminal convictions should recognize that such convictions may impede licensure or employment and that the University of Alabama at Birmingham cannot predict the future decisions of fieldwork/capstone sites, licensing agencies, or employers. An individual who is considering, or who has entered, an occupational therapy education program can have his/her background reviewed by requesting an Early Determination Review from NBCOT at https://www.nbcot.org/en/Students/Services

Length of Study

Minimum of eight (8) semesters as a full-time student.

Entrance Date

Summer semester

Application Deadline

This program participates in the Occupational Therapy Centralized Application Service (OTCAS). Please consult www.otcas.org for more information regarding specific OTCAS application requirements, procedures, and fees. The OTCAS application needs to be completed by the OTCAS deadline. Applicants should send all application materials directly to OTCAS. OTCAS will verify the application information and send completed applications to the department. Contact Information for OTCAS: Web: https://portal.otcas.org/.

Requirements for Admission

The applicant must hold a baccalaureate degree from an accredited college or university in a field other than occupational therapy. Acceptance will be based on the student's academic ability, aptitude for a career as an occupational therapist, and an interview. The candidate is expected to satisfy the following requirements:

- Complete the OTCAS application based on the OTCAS deadline.
- Hold a baccalaureate degree in a discipline other than occupational therapy from an accredited college or university; or receive a baccalaureate degree prior to admission.
- Completion of prerequisite coursework prior to admission.
- Complete either:
  - At least 20 hours of observation of occupational therapy. Various settings are recommended. Or:
  - The “Introduction to Occupational Therapy” course (offered 100% online)
- Have an overall minimum GPA of 3.0 as calculated by OTCAS or a minimum GPA of 3.0 in the last 60 hours of coursework;
- Have an overall minimum GPA of 3.0 or better for all prerequisite courses. For prerequisite courses, no grade lower that a B will be accepted.
- If invited, complete an interview with faculty of the Department of Occupational Therapy.

Students who are **accepted** into the UAB Clinical Doctorate in Occupational Therapy (OTD): entry level program must:

- Complete the UAB Graduate School application to include the Graduate School fee.
- Complete the UAB medical history questionnaire and physical.
- Provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service.
- Send all official transcripts to the UAB Graduate School.
- Submit a $300 non-refundable deposit to reserve a seat in the program (deposit will be applied to tuition for students who start the program).
- Complete a criminal background check and drug screen before program matriculation and as specified by the Department of Occupational Therapy.

Prerequisites-UAB Equivalents

All prerequisites must be completed in the last 8 years with a grade of "B" or better, or must be scheduled for completion prior to **admission.** (Transfer equivalents for UAB can be found by clicking here.)

Course requirements are listed in semester credit hours.

Requirements		Hours
Arts and Humanities		**3**
EH 302	Intermediate Writing	
Social and Behavioral Sciences		**6**
PY 218	Psychopathology	
PY 212	Developmental Psychology ((course must cover human development from prenatal to old age)	
Natural Sciences and Mathematics		**22**
Statistics (must be taken in Math, Psychology or Sociology)		
MA 180	Introduction to Statistics	
or PY 216	Elementary Statistical Methods	
or SOC 4[	Social Statistics	
or HCM 3(	Statistics for Managers	
Biology with Lab		
BY 123 & 123L	Introductory Biology I and Introductory Biology I Laboratory	
Human Anatomy with Lab		
BY 115 & 115L	Human Anatomy and Human Anatomy Laboratory	
Human Physiology with Lab		
BY 116 & 116L	Introductory Human Physiology and Introductory Human Physiology Laboratory	
Kinesiology		
KIN 307	Applied Kinesiology	
Introductory Sociology or Cultural Anthropology		
SOC 100	Introduction to Sociology	
or ANTH 1	Introducing Cultural Anthropology	
Medical Terminology is strongly recommended		
HCM 350	Medical Terminology for Health Professionals	

Essential Requirements

Prior to enrollment, students must certify their ability to complete the essential tasks, with or without reasonable accommodation, associated with performing as an occupational therapy student. Reasonable accommodation refers to ways in which the University can assist students with disabilities to accomplish these tasks (for example, providing extra time to complete an examination or enhancing the sound system in a classroom). Reasonable accommodation does not mean that students with disabilities will be exempt from certain tasks; it does mean that the Department of Occupational Therapy will work with students with disabilities to determine whether there are ways to assist the student with completion of the required tasks.

After enrollment, a student with a disability who wishes reasonable accommodation contacts Disability Support Services (205) 934-4205 or (205) 934-4248 (TDD) or visit 9th Avenue Office Bldg. 1701 9th Ave., provides appropriate and current documentation substantiating the claimed disability, meets the requirements of a disability as described in the ADA, and identifies the needed accommodation. Reasonable accommodation in classroom and in practice settings cannot be provided without the formal request and the required documentation of the ADA defined disability. (Visit http://www.uab.edu/dss)

Essential Tasks

The student possess sufficient cognitive skills to:

- Acquire, process, retain and apply knowledge through a variety of instructional methods such as: written materials (i.e. texts, journals, documentation and other written sources), oral delivery, visual demonstrations, laboratory experiences, clinical experiences and independent learning.
- Complete reading assignments, search and analyze professional literature, and apply information gained to guide practice.
- Process (measure, calculate, analyze, synthesize and evaluate) large amounts of complex information; apply theoretical concepts to practice activities and perform clinical problem-solving in a logical and timely manner.
- Perceive and understand three-dimensional relationships and spatial relationships necessary for education and practice related tasks such a moving in a variety of environments, designing treatment equipment, and fabricating splints.
- Maintain attention for 2-4 hours; tolerate days when classes or fieldwork may last 8-10 hours.
- Take and pass test/quizzes in a variety of formats.
- Complete written assignments and produce written documentation in standard and organized English.
- Apply knowledge and judgment required to demonstrate ethical reasoning and behavior.
- Apply safety knowledge and judgment to a variety of situations.
- Comply with University, Program, and fieldwork site rules and regulations.
- Demonstrate problem-solving skills and judgment necessary to modify evaluation or intervention methods when necessary to address the specific needs of individuals (behavioral, cultural, etc.), in order to maximize client performance.
- Apply clinical reasoning and judgment necessary for interpretation of evaluation data and development of treatment plans.
- Identify and select occupations that are goal directed and motivate and challenge clients.
- Demonstrate judgment necessary to establish priorities and develop and use strategies.

The student must possess sufficient interpersonal skills, communication skills, and affective learning skills to:

- Demonstrate positive sufficient interpersonal skills including, but not limited to, cooperation, flexibility, tact, empathy, and confidence.
- Collaborate with classmates, clients, family members, significant others, and team members.
- Function successfully in supervisory, and instructor-student relationships; change and adjust behavior and performance in the classroom, laboratory, or clinic on the basis of instructor feedback.
- Participate equitably in cooperative group learning activities; actively participate in class discussions and as a member of a team.
- Sustain the mental and emotional rigors of a demanding educational program in occupational therapy that includes academic and clinical components that occur within set time constraints and often concurrently.
- Orally present information to groups of people.
- Communicate in the English language effectively and clearly in oral and written forms, using proper spelling, punctuation, and grammar to explain procedures and teach skills.
- Use language appropriate to the recipient, with faculty, peers, clients, and other health professionals from different social and cultural backgrounds; use communication skills needed to practice safely.
- Obtain information from clients, peers, faculty, supervisors, and other professionals.
- Use therapeutic communication skills such as attending and active listening during therapeutic interactions; and motivating and facilitating client behaviors in order to maximize client performance.
- Communicate effectively both verbally and non-verbally; elicit and describe factual information and perceive information derived from verbal and non-verbal communication and social cues.
- Be appropriately assertive as required to speak in class, initiate and guide the therapy process, establish limits as needed for the safety of self and clients and establish professional identity within complex systems.
- Utilize the computer for communication and class assignments.
- Observe persons and scenarios and elicit relevant information for use in assessment and intervention.
- Plan, guide and implement both individual and group interventions.

The student must possess sufficient professional behavior to:

- Demonstrate respect for diversity, including but not limited to, socio-cultural, socioeconomic, spiritual, and lifestyle choices.
- Function successfully in supervisory and instructor-student relationships; change and adjust behavior and performance in the classroom, laboratory, or clinic on the basis of instructor feedback.
- Exhibit professional demeanor including appropriate language and dress, acceptance of responsibility for conduct.
- Demonstrate organizational and time management skills and ability to prioritize activities effectively as needed to attend class and fulfill class requirements.
- Exhibit flexibility and adapt to changing environments and expectations.
- Cope with stresses encountered in the intensive educational process as well as clinical practice environments.
- Demonstrate consistent work behaviors including initiative, preparedness, dependability, punctual attendance and work site maintenance.
- Tolerate working in environments where there is exposure to disability, illness, pain, and death.
- Maintain general good health and self-care in order not to jeopardize the health and safety of self and others in the academic and clinical settings.
- Maintain ethical standards including honesty, integrity, and confidentiality, at all times.
- Produce the required volume of work in the expected time frame.

The student must possess sufficient physical and sensory skills to:

- Tolerate sitting up to 2 hours at a time, over an 8-10 hour period.
- Tolerate periods of physical activity up to 8-10 hours per day.
- Demonstrate coordination, equilibrium, and sensory functioning required to manipulate parts of, or whole bodies of, simulated and real clients for purposes of evaluation and treatment.

- Demonstrate mobility and ability to move within environments adequately to access and maneuver within locations and destinations including classroom, lab, and clinical settings.
- Demonstrate lifting ability sufficient to maneuver an individual's body parts effectively to perform evaluation and treatment techniques including, but not limited to, transferring another person into and out of a wheelchair, to and from the commode or bed, etc.
- Demonstrate sufficient postural control, neuromuscular control, eye/hand coordination, and integrated function of the senses of vision, hearing, tactile sense, vestibular (movement sense) and proprioception (sense of muscles and joints) to manipulate and use common occupational therapy equipment, devices, materials, and supplies, and demonstrate competency in the use of these objects within assessment and treatment procedures commonly used in occupational therapy practice.
- Demonstrate motor skill capacities with sufficient levels of strength, endurance and fine and gross motor coordination to safely, accurately, and effectively engage in a wide variety of therapeutic techniques, activities and occupations used in the occupational therapy assessment and intervention process; these capacities would include ability to lift and move objects, adequate manual dexterity, arm and hand function needed to use tools and perform other manipulative activities, use of limbs and trunk in bending, twisting, squatting, kneeling, reaching, pushing, pulling, holding, extending, and rotation.
- Manipulate or guide another person's body in transfers, ambulation, positioning and assisted or facilitated trunk, head, and limb movements.
- Manipulate bolsters, pillows, plinths, mats, assistive/adaptive devices, and other supports or chairs to aid in positioning, moving, or treating a patient/client effectively.
- Legibly record/document evaluations, patient care notes, and referrals, etc., in standard medical charts in clinical settings in a timely manner and consistent with the acceptable norms of clinical settings.
- Demonstrate or complete activities or tests with adequate degree of fine motor dexterity.
- Tolerate physical contact with others; tolerate manipulation of his/her own body by peers or instructors for instructional purposes.
- Demonstrate a sufficiently high degree of coordination of motor skills and vigilance to respond to emergency situations quickly and appropriately, including performance of CPR.
- Travel to various community and fieldwork sites for experiential learning, clinical opportunities, and fieldwork.

Typical Program

Total curriculum hours for the Entry-Level OTD: 107

Requirements		Hours
First Year (Summer)		15
OT 701	Theoretical Foundations for Occupational Therapy Practice	
OT 704	Research Design for Occupational Therapy Practice	
OT 715	Introduction of the OT Process, Analysis and Adaptation of Occupation	
OT 716	Social, Economic and Political Factors that Influence Occupational Therapy	
OT 717	Creative Occupations	
OT 730	Performance Skills for Occupation: Introduction	
First Year (Fall)		13
OT 720	Contexts of Professional Practice: Infancy to Early Childhood	
OT 726	Low Vision and Participation	
OT 731	Performance Skills for Occupation: Infancy to Adolescence	
OT 764	Fieldwork Experience	
OT 776	Capstone Project	
Second Year (Spring)		15
OT 705	Evidenced-based Occupational Therapy Practice Design and Application	
OT 721	Contexts of Professional Practice: Childhood to Adolescence	
OT 732	Performance Skills for Occupation: Adulthood	
OT 750	Scholarly Inquiry I	
OT 764	Fieldwork Experience	
OT 776	Capstone Project	
Second Year (Summer)		16
OT 703	Advocacy and Healthcare Policy in Population Health	
OT 706	Management for Occupational Therapy Practice	
OT 722	Contexts of Professional Practice: Early Adulthood to Middle Adulthood	
OT 751	Scholarly Inquiry II	
OT 764	Fieldwork Experience	
OT 776	Capstone Project	
Second Year (Fall)		14
OT 634	Seminar in Professional Readiness	
OT 723	Contexts of Professional Practice: Later Adulthood	
OT 727	Health and Wellness Promotion	
OT 774	Contemporary and Emerging Issues in Occupational Therapy	
OT 776	Capstone Project	
Third Year (Spring)		10
OT 765	Advanced Fieldwork I	
Third Year (Summer)		10
OT 766	Advanced Fieldwork II	
Third Year (Fall)		14
OT 777	Capstone Experience: Emerging as an Occupational Therapist	
Total Hours		**107**

For further information contact:
UAB Department of Occupational Therapy
Recruitment and Admissions Coordinator
SHPB 353, 1716 9th Avenue South
Birmingham, AL 35294-1212
Telephone 205-934-3568
E-mail **OTD@uab.edu**
Web http://www.uab.edu/shp/ot

Post-professional OTD Track

Length of Study

The program requires variable semesters to complete; students taking two courses per semester should finish in 2 1/2 years. Students taking only one course per semester or a mix of credit hours across semesters will take longer. One course a semester will take four (4) years. The UAB Graduate School mandates degree completion in five (5) years.

Requirements for Admission

Admission is open to therapists with current master's or bachelor's degrees in occupational therapy conferred from an accredited occupational therapy program who are currently employed or have a minimum of one year experience as an occupational therapist.

Requirement	Fulfilled By:
Entry Term:	Fall
Deadline for ALL Application Materials to be in the Graduate School Office:	August 1
Entrance Tests:	For international applicants from non-English speaking countries, scores for the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS)

All Post-Professional OTD applicants must complete the following requirements:

*No GRE (Graduate Record Examination) is required.

**Students planning to take the Low Vision Graduate Certificate concentration must also submit a copy of their US license. This does not apply to international students.

- Current master's or bachelor's degree in occupational therapy from an accredited program (this includes applicants who have an OTA degree and a BS degree in a related field).
- Applicants must be currently or have been previously employed as an occupational therapist or OTA with at least one year of clinical experience.
- The ability to complete essential tasks, with or without reasonable accommodation, associated with performing as an occupational therapy student.
- Curriculum vitae (CV)/ Resume.
- GPA of 3.0 from most recent degree.
- A Letter of Intent (minimum of two double-spaced pages and maximum of four pages in length to be submitted before interview) providing a description of how the program aligns with the applicant's intended career goals.
- Three letters of reference from professionals you have worked with.
- Interview (online or in-person).
- Computer skills.

International Students:

See Clinical Doctorate in Occupational Therapy Admissions Checklist, in addition to the following items:

- A transcript evaluation from World Education Services (www.wes.org) or Educational Credential Evaluators (www.ece.org) may be required.
- Students from countries where English is not the official and primary language may be required to take the TOEFL, or the IELTS.A minimum score of 550 on the paper text, 213 on the computer version, or 80 on the internet-based test of the TOEFL or a minimum score of 6.0 – 6.5 on the IELTS test is recommended.

Essential Requirements

After acceptance, and prior to enrollment into online programs, students must certify their ability to complete the essential tasks, with or without reasonable accommodation, associated with performing as an occupational therapy student. Reasonable accommodation refers to ways in which the University can assist students with disabilities to accomplish these tasks (for example, providing extra time to complete an examination). Reasonable accommodation does not mean that students with disabilities will be exempt from certain tasks; it does mean that the Department of Occupational Therapy will work with students with disabilities to determine whether there are ways to assist the student with completion of the required tasks.

After enrollment, a student with a disability who wishes reasonable accommodation must contact Disability Support Services at (205) 934-4205 or (205) 934-4248 (TDD), provide appropriate and current documentation substantiating the claimed disability, meet the requirements of a disability as described in the ADA, and identify the needed accommodation. Reasonable accommodation in classroom and in practice settings cannot be provided without the formal request and the required documentation of the ADA defined disability. (Visit http://www.uab.edu/dss).

Essential Tasks

- Students must be competent in computer skills to include use of the Microsoft Office Suite (Word, PowerPoint, Excel, etc.), email correspondence, web search skills. The student must have adequate and reliable access to the internet. Recommended technology resources are described at https://www.uab.edu/elearning/academic-technologies/canvas.
- Students must meet class standards for course completion throughout the curriculum.
- Students must be able to read, write, speak, and understand English at a level consistent with successful course completion and development of positive client therapist relationships.
- Students must complete readings, assignments, and other activities.
- Students must gather decision-making pieces of information during client assessment activities.
- Students must perform evaluation and intervention activities by direct performance keys.
- Students must apply critical thinking processes to their work in the courses.
- Students must have interpersonal skills as needed for productive discussion, and respectful interaction with classmates and faculty.
- Students must demonstrate appropriate health status prior to enrollment with annual updates on some items. Requirements at www.uab.edu/studenthealth.

- Students must follow standards and policies specified in the Department of Occupational Therapy Student Handbook posted online on our website at http://www.uab.edu/shp/ot/admissions.

Degree

On completion of the required coursework the student will be awarded an OTD by the University of Alabama at Birmingham and the student's name will appear in the commencement bulletin. A transcript of the coursework taken for the degree will be available through the University Registrar's Office.

The curriculum for the degree is offered online via a web-based learning management system for students in the program. Students accepted into the program begin the curriculum in August and complete one or more courses per semester. The clinical doctorate requires variable semesters to complete; students taking 2 courses per semester should finish in 2 1/2 years. Students taking only 1 course per semester or a mix of credit hours across semesters will take longer.

Typical Program

The curriculum is designed with the working occupational therapist in mind. Coursework emphasizes practical application to the OT clinic environment. Projects are designed to reinforce classroom learning for application to practice. Materials for completion of the courses can be obtained through the Internet, materials provided, and required texts.

The Post-Professional OTD follows a core/concentration model which consists of a total of 40 semester hours. 25 semester hours are taken in the core. The remaining 15 semester hours are taken in specialty areas (Low Vision Rehabilitation, Healthcare Quality and Safety, or General).

Required Core Courses

Requirements		Hours
Core Course Requirements		
OT 701	Theoretical Foundations for Occupational Therapy Practice	3
OT 702	Leadership for OT Practice Excellence	2
OT 703	Advocacy and Healthcare Policy in Population Health	3
OT 704	Research Design for Occupational Therapy Practice	3
OT 705	Evidenced-based Occupational Therapy Practice Design and Application	3
OT 706	Management for Occupational Therapy Practice	3
OT 707	Occupational Therapists as Educators	2
OT 798	Occupational Therapy Capstone Experience/Non-Thesis Project Minimum of 6 credit hours completed over multiple semesters upon completion of OT704 and OT 705	6
Total Hours		**25**

Low Vision Rehabilitation Concentration

Requirements		Hours
Elective Course Requirements for students completing the Low Vision Rehabilitation concentration		
OT 677	Foundations in Low Vision Rehabilitation I	3
OT 679	Foundations in Low Vision Rehabilitation II	3
OT 689	Foundations in Treatment of Visual Impairment from Brain Injury	3
OT 690	Foundations in Low Vision Rehabilitation III	3
OT 691	Foundations in Low Vision Rehabilitation IV	3
Total Hours		**15**

Healthcare Quality and Safety Concentration

Requirements		Hours
Elective Course Requirements for students completing the Healthcare Quality and Safety concentration		
HQS 600	Introduction to Clinical Quality Improvement	4
HQS 610	Quantitative Methods, Measurement, and Tools for Quality Improvement	4
HQS 625	Fundamentals of Patient Safety	4
HQS 630	Leadership of High Reliability Healthcare Organizations	3
Total Hours		**15**

General Concentration

Requirements		Hours
Elective Course Requirements for students completing the General concentration (select 15 hours)		15
OT 710	Introduction to Occupational Science	3
OT 711	Adaptation and Disability in Occupational Therapy Practice	3
OT 714	Program Evaluation in Occupational Therapy	3
OT 775	Independent Study in Occupational Therapy	1-3
OT 792	Special Topics in Occupational Therapy	1-4
GRD 727	Writing & Reviewing Research	3

https://www.uab.edu/graduate/admissionsrequirements

International Students:

See Clinical Doctorate in Occupational Therapy Admissions Checklist, in addition to the following items:

- A transcript evaluation from World Education Services (www.wes.org) or Educational Credential Evaluators (www.ece.org) may be required.
- Students from countries where English is not the official and primary language may be required to take the TOEFL, or the IELTS.A minimum score of 550 on the paper text, 213 on the computer version, or 80 on the internet-based test of the TOEFL or a minimum score of 6.0 – 6.5 on the IELTS test is recommended.

Typical Program

Total Curriculum Hours for the Post-Professional OTD: 40

For further information contact:
UAB, Department of Occupational Therapy
Program Director, Occupational Therapy Post-Professional Doctorate Program
SHPB 338, 1716 9th Avenue South
Birmingham, AL 35294-1212
Telephone 205-934-8623
E-mail **OTD@uab.edu**
Web http://www.uab.edu/shp/otd

Courses

OT 615. Occupational Therapy Study Abroad. 1 Hour.
A five-week program that offers a unique combination of online and classroom learning, an in-country community engagement and cultural immersion. Selected location and on-site activities provided in the current course syllabus.

OT 634. Seminar in Professional Readiness. 2 Hours.
Forum for exchange of ideas and experiences; student, faculty, and alumni presentations on variety of topics.

OT 677. Foundations in Low Vision Rehabilitation I. 3 Hours.
Information on the topics of low vision rehabilitation including demographics and characteristics, settings and provider systems, anatomy and physiology of the eye and visual system, medical conditions causing low vision and common co-occurring secondary health conditions, low vision evaluation and screening, contribution of low vision on occupational performance and environmental interaction, and intervention strategies used by the occupational therapy generalist working in low vision.

OT 679. Foundations in Low Vision Rehabilitation II. 3 Hours.
Techniques for selecting, developing, and applying interventions to enhance occupational performance. Topics covered include optical devices, assistive technology and computer modifications, reading, and writing.
Prerequisites: OT 677 [Min Grade: C]

OT 680. Foundations of Blind Rehabilitation. 3 Hours.
Knowledge needed to understand and implement non-visual intervention strategies.

OT 689. Foundations in Treatment of Visual Impairment from Brain Injury. 3 Hours.
Evaluation and intervention for adults experiencing occupational limitations due to visual processing impairment from acquired brain injury. Topics include neuroanatomy of the visual processing system, evaluation and intervention for deficits in visual acuity, visual field oculomotor function, and visual attention and cognitive processing.
Prerequisites: OT 679 [Min Grade: C]

OT 690. Foundations in Low Vision Rehabilitation III. 3 Hours.
Techniques for selecting, developing, and applying interventions to enhance occupational performance. Topics covered include activities of daily living with and without vision, functional mobility, diabetes self-management, and driving and transportation.
Prerequisites: OT 679 [Min Grade: C]

OT 691. Foundations in Low Vision Rehabilitation IV. 3 Hours.
Students demonstrate ability to apply knowledge gained in the previous foundation courses to select and interpret evaluations and design interventions for adults with vision impairment. Format includes: a three-day on-campus intensive to provide review and synthesis of key evaluation and intervention principles for working with persons with age-related vision impairment and brain injury; practicum in diabetes self-management, prescribed optical devices and assistive technology; influence of policy and regulation on practice; ethical reasoning and advocacy; professional development and continuing professional competence.
Prerequisites: OT 677 [Min Grade: C] and OT 679 [Min Grade: C] and OT 689 [Min Grade: C] and OT 690 [Min Grade: C]

OT 692. Special Topics in OT. 1-4 Hour.
Readings for in depth study of specialized topics.

OT 701. Theoretical Foundations for Occupational Therapy Practice. 3 Hours.
Occupational therapy frameworks, theory, philosophy, conceptual models, and practice models as guides to clinical reasoning; integration into clinical practice.

OT 702. Leadership for OT Practice Excellence. 2 Hours.
Leadership competencies for the occupational therapist; leadership and management theories to guide and enhance professional practice.

OT 703. Advocacy and Healthcare Policy in Population Health. 3 Hours.
Broad overview and challenges of the current U.S. healthcare system; impact of regulation on health care access, delivery, cost, and quality for disability populations; advocacy role for OTs working with these populations.

OT 704. Research Design for Occupational Therapy Practice. 3 Hours.
Research designs and advanced statistical concepts; internal and external validity; confounding variables; extrapolation of research findings; critique of the professional literature.

OT 705. Evidenced-based Occupational Therapy Practice Design and Application. 3 Hours.
Strategies for evidence-based service delivery; critical analysis of the literature to support clinical practice. Includes applied project.

OT 706. Management for Occupational Therapy Practice. 3 Hours.
Managing people and resources in a practice environment changing due to political, regulatory, economic, and social drivers.

OT 707. Occupational Therapists as Educators. 2 Hours.
Role of the occupational therapist as educator; teaching and learning styles; effective organization of educational experiences.

OT 710. Introduction to Occupational Science. 3 Hours.
Conceptual foundations and methodological orientations for occupational science; human drive to remain occupied; creation of identity through meaningful activity; enhancing health and wellness through occupation.

OT 711. Adaptation and Disability in Occupational Therapy Practice. 3 Hours.
Process of social and cultural adaptation to disabilities and stigmatized medical conditions using examples from different cultures and disabilities.

OT 712. Environment and Context in Occupational Therapy Practice. 3 Hours.
Relationship between environments and context from the micro (home) to the macro level (country view); impact of these constructs on disability over the lifespan.

OT 713. Professional Writing. 3 Hours.
Advanced writing course designed to teach professional writing styles commonly used in academia and professional practice.

OT 714. Program Evaluation in Occupational Therapy. 3 Hours.
Designs and methods in formative and summative program evaluation; quantitative and qualitative strategies; communicating information to stakeholders.

OT 715. Introduction of the OT Process, Analysis and Adaptation of Occupation. 3 Hours.
Examines the complex nature of occupation and how it contributes to the experience of being human; Employing logical thinking, critical analysis, problem-solving and creativity, students will learn how to analyze and adapt occupations. Students will study the domain and process of occupational therapy through case based learning.

OT 716. Social, Economic and Political Factors that Influence Occupational Therapy. 2 Hours.
Examines the individual, community and systems level influencers of occupational participation; Discussion of health viewed through social, cultural and systemic factors. Focus on developing critical thinking skills related to occupational justice, occupational disruption, deprivation, apartheid, transitions and imbalance in culturally responsive practice.

OT 717. Creative Occupations. 2 Hours.
Exploration of arts and crafts in both historical and contemporary contexts; involvement in creative projects and reflections on experience to support understanding of creativity in the arts, sciences, professions, evaluation, daily life, and culture.

OT 720. Contexts of Professional Practice: Infancy to Early Childhood. 6 Hours.
Evaluation, planning, implementing, and documenting client-centered, occupation and evidence-based occupational therapy assessment and intervention of infancy to early childhood.

OT 721. Contexts of Professional Practice: Childhood to Adolescence. 6 Hours.
Evaluation, planning, implementing, and documenting client-centered, occupation and evidence-based occupational therapy assessment and intervention of childhood to adolescence.

OT 722. Contexts of Professional Practice: Early Adulthood to Middle Adulthood. 6 Hours.
Evaluation, planning, implementing, and documenting client-centered, occupation and evidence-based occupational therapy assessment and intervention of early adulthood to middle adulthood.

OT 723. Contexts of Professional Practice: Later Adulthood. 6 Hours.
Evaluation, planning, implementing, and documenting client-centered, occupation and evidence-based occupational therapy assessment and intervention of later adulthood.

OT 726. Low Vision and Participation. 3 Hours.
Evaluation, planning, implementing, and documenting client-centered, occupation and evidence-based occupational therapy assessment and intervention to address issues related to vision loss across the lifespan referred for OT treatment in all practice settings. Case-based learning.

OT 727. Health and Wellness Promotion. 3 Hours.
Occupational Therapy's role in developing theory-driven and evidence-based health promotion and wellness programs. Theoretical perspectives and intervention models guiding health promotion and wellness programs for individuals or groups of people, with and without disabilities, and in a variety of settings. Case-based learning.

OT 730. Performance Skills for Occupation: Introduction. 2 Hours.
Introduction to the examination of anatomical, physiological, neurological, cognitive, biomechanical and functional movement principles and the relation of these, and changes to occupational participation.

OT 731. Performance Skills for Occupation: Infancy to Adolescence. 2 Hours.
Anatomical, physiological, neurological, cognitive, biomechanical and functional movement principles and the relation of these, and changes, from infancy through adolescence, to occupational participation.

OT 732. Performance Skills for Occupation: Adulthood. 2 Hours.
Examines anatomical, physiological, neurological, cognitive, biomechanical and functional movement principles and the relation of these, and changes, across adulthood, to occupational participation.

OT 750. Scholarly Inquiry I. 2 Hours.
Introduction to key elements of quantitative and qualitative research design and implementation relevant to occupational therapy practice. Integration of theory, research design, and methods to design and implement a scholarly study.

OT 751. Scholarly Inquiry II. 2 Hours.
Continued study of key elements of quantitative and qualitative research design and implementation relevant to occupational therapy practice. Integration of theory, research design, and methods to design and implement a scholarly study.

OT 764. Fieldwork Experience. 1 Hour.
Series of experiential courses that emphasize the application of occupational therapy skills when working with clients and the influence that physical, psychological and/or social factors have on participation in occupation.

OT 765. Advanced Fieldwork I. 10 Hours.
Supervised practice experience designed to develop advanced entry-level, generalist professional skills.

OT 766. Advanced Fieldwork II. 10 Hours.
Supervised practice experience designed to develop advanced entry-level, generalist professional skills.

OT 774. Contemporary and Emerging Issues in Occupational Therapy. 2 Hours.
Exposure to contemporary and emerging issues and trends in occupational therapy practice; value and contribution of occupational therapy in complex and emerging settings; key competencies and unique professional attributes of occupational therapists; factors influencing health and social contexts.

OT 775. Independent Study in Occupational Therapy. 1-4 Hour.
Faculty-led exploration of a specific topic/issue related to occupational therapy.

OT 776. Capstone Project. 1 Hour.
In-depth exposure to one or more of the following: clinical practice skills, research skills, administration, leadership, program and policy development, advocacy, education, and theory development. Synthesis project includes literature review, needs assessment, goals/objectives, and evaluation plan.

OT 777. Capstone Experience: Emerging as an Occupational Therapist. 14 Hours.
Supervised experience for dissemination and application of the capstone synthesis project to demonstrate in-depth knowledge in a focused area of study.

OT 792. Special Topics in Occupational Therapy. 1-4 Hour.
Exploration of current issues in occupational therapy.

OT 798. Occupational Therapy Capstone Experience/Non-Thesis Project. 1-6 Hour.
Focused investigation of an occupational therapy problem in a professional practice setting; application of concepts and tools presented in the program courses. Written project report required.

Physical Therapy

Degree Offered:	D.P.T.
Director (D.P.T.):	Jennifer Christy, PT, PhD, FAPTA
Phone:	(205) 934-3566
Website:	www.uab.edu/shp/pt

Program Information

The Doctor of Physical Therapy program is a course of study for students who hold baccalaureate degrees in fields of study other than Physical Therapy. Completion of the program after nine semesters

leads to a Doctor of Physical Therapy (DPT) degree and serves as initial preparation for practice as a physical therapist.

Doctor of Physical Therapy (D.P.T.)

Physical therapists provide services to patient/clients who have body structure and function impairments, activity limitations, participation restrictions, or changes in physical function and health status resulting from injury, disease, and other causes. Physical therapists also address risk and provide prevention services and promote health, wellness, and fitness. Physical therapists interact and practice in collaboration with a variety of professionals. Physical therapists also function in consultative, education, administrative and supervisory roles in many different types of practice, research, and education settings.

Accreditation: The program is accredited by the Commission on Accreditation in Physical Therapy Education. (www.capteonline.org/home.aspx)

Credentials Conferred: The Doctor of Physical Therapy degree is awarded by the University of Alabama at Birmingham.

License: Graduates are eligible for the physical therapist licensure examination. Note that state law regulates the practice of Physical Therapy; contact a specific state's Board of Licensure for Physical Therapy to obtain information on that state's eligibility requirements. https://www.fsbpt.org/Free-Resources/Licensing-Authorities-Contact-Information

Length of Study: Nine semesters.

Program Entrance Date: Spring semester.

Application Procedure: This program participates in the Physical Therapist Centralized Application Service (PTCAS). Please consult **www.ptcas.org** for more information regarding specific PTCAS application requirements, procedures and fees. The PTCAS application needs to be completed by the PTCAS deadline. Applicants should send all application materials directly to PTCAS. PTCAS will verify the application information and send completed applications to the program.

Requirements for Admission: The applicant must hold a baccalaureate degree from an accredited college or university within the United States in a field other than physical therapy. Acceptance will be based on the student's academic ability and aptitude for a career as a physical therapist. The candidate is expected to satisfy the following requirements:

- Complete the PTCAS application based on the PTCAS deadline.
- 75% of prerequisite courses must be completed by the end of the fall semester of the year of application.
- Complete at least 40 hours of documented observation of physical therapy. Various settings are recommended. Documentation should be submitted to PTCAS.
- Submit three letters of recommendation to PTCAS.
  - Letters 1 and 2: Written by a physical therapist who has interacted with the applicant for at least 20 hours in a clinical setting.
  - Letter 3: Written by a professor with whom the applicant had significant interaction in an academic setting.
- Have a minimum 3.0 (A=4.0) overall, prerequisites, and last 60 semester hours grade point averages. For prerequisite courses, no grade lower than a C will be accepted.
- If invited, complete a personal interview with the Department of Physical Therapy.

Students who are **accepted** into the UAB Doctor of Physical Therapy program must:

- Complete the UAB Graduate School application to include the Graduate School fee.
- Complete the UAB medical history questionnaire and physical.
- Provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service.
- Send all official transcripts to the UAB Graduate School.
- Complete a criminal background check and drug screen before program matriculation and as specified by the Department of Physical Therapy.

State law regulates the practice of Physical Therapy. Therefore, applicants are encouraged to review the nonacademic eligibility requirements for licensure to practice physical therapy prior to application to the program. These may be obtained from each individual state's Board of Licensure for Physical Therapy. https://www.fsbpt.org/Free-Resources/Licensing-Authorities-Contact-Information

Program Prerequisites–UAB Equivalents

(Course requirements are listed in semester credit hours)

Arts and Humanities
English Composition (6)

Social and Behavioral Sciences
Psychology (6)

Natural Sciences and Mathematics

Biology (12)
Human/Mammalian Physiology (4)
Chemistry for Science Majors (8)
Physics for Science Majors (8)
Pre-Calculus With Trigonometry (3)
Psychology (6)
Statistics (3)
Medical Terminology (1-3)

It is strongly recommended that applicants take the following courses: practical reasoning or logic course, biomechanics or kinesiology and upper level biology (physiology).

Essential Requirements: Fundamental tasks, behaviors, and abilities necessary to successfully complete the academic and clinical/residency requirements of the program and to satisfy licensure/certification requirements, if any, have been outlined and are available on the program's website: https://www.uab.edu/shp/pt/programs/dpt/admissions. Students requesting disability accommodations must do so by filing a disability accommodation request with the UAB Office of Disability Support Services.

Additional Information

For detailed information, contact the Department of Physical Therapy, School of Health Professions, SHPB, Room 375, 1716 9th Avenue South (mailing address: SHPB 375, 1720 2nd Avenue South), Birmingham, Alabama 35294-1212.

Telephone 205-934-4363

E-mail **DPTAdmissions@uab.edu**

Doctor of Physical Therapy

Requirements		Hours
PT 700	Human Gross Anatomy	3
PT 702	Functional Anatomy	4
PT 710	Physical Therapy Intervention I	3
PT 730	Essentials of Human Physiology	3
PT 760	PT Professional Practice I	2
PT 701	Human Gross Anatomy II	2
PT 711	PT Examination I	2
PT 712	Physical Therapy Examination II	3
PT 720	Pathology and Pharmacology for Movement Disorders I	3
PT 731	Human Performance Physiology	3
PT 790	Scientific Inquiry I	2
PT 704	Analysis of Human Movement	3
PT 706	Neuroscience I	3
PT 714	Physical Therapy Intervention II	3
PT 715	Physical Therapy Intervention III	3
PT 721	Pathology and Pharmacology for Movement Disorders II	3
PT 716	Clinical Evaluation in Physical Therapy	3
PT 707	Neuroscience II	3
PT 740	PT Management of Musculoskeletal Dysfunction I	5
PT 761	PT Professional Practice II	3
PT 798	Doctoral Level Non-Thesis Research	1
PT 743	PT Management of Cardiopulmonary Dysfunction	4
PT 744	PT Management of Neuromuscular Dysfunction I	3
PT 770	Clinical Education	4
PT 791	Scientific Inquiry II	2
PT 798	Doctoral Level Non-Thesis Research	1
PT 741	PT Management of Musculoskeletal Dysfunction II	5
PT 746	PT Management of Neuromuscular Dysfunction II	5
PT 762	PT Professional Practice III	3
PT 798	Doctoral Level Non-Thesis Research	1
PT 763	PT Professional Practice IV	2
PT 764	Professional Practice V - Capstone Experience	2
PT 770	Clinical Education	9
PT 770	Clinical Education	9
PT 770	Clinical Education	9
Total Hours		**119**

Primary Care Physical Therapy for Underserved Populations Graduate Certificate

The Graduate Certificate in Primary Care Physical Therapy for Underserved Populations provides a broader scope of skills and knowledge necessary to meet the need of underserved communities and marginalized populations.

Credentials Conferred

The Graduate Certificate in Primary Care Physical Therapy for Underserved Populations is awarded by the University of Alabama at Birmingham.

Program Entrance Date

Fall, Spring, and Summer semesters

PRIMARY CARE PHYSICAL THERAPY FOR UNDERSERVED POPULATIONS CURRICULUM

Requirements		Hours
PTC 790	Challenges in American Healthcare: Physical Therapy as a Part of the Solution	2
PTC 791	Physical Therapist Role in Primary Care	2
PTC 792	Health-Focused Physical Therapy Care I	2
PTC 793	Advanced Physical Therapy Management of Priority Health Conditions I	2
PTC 794	Health Focused Physical Therapy II	2
PTC 795	Advanced Physical Therapy Management of Priority Health Conditions II	2
PTC 796	Physical Therapists' Role in Disaster Emergency Preparation and Management	1
PTC 797	Community Engagement and Program Planning for Physical Therapists	2
Total Hours		**15**

CONTACT INFORMATION

For detailed information, contact the office of the Graduate Certificate in Primary Care Physical Therapy for Underserved Populations, UAB School of Health Professions, 1716 9th Avenue South, Birmingham, AL 35294-1212.

Telephone 205-934-0241

E-mail dlein@uab.edu

Web Primary Care Physical Therapy for Underserved Populations

Courses

PT 700. Human Gross Anatomy. 3 Hours.
A study of the anatomical structure of the human body includes limbs, back, abdominal wall and cavity. Specific emphasis includes regional study of the relationships between musculoskeletal, nervous, and vascular systems, joint structure, cardiovascular and pulmonary systems, and surveys of selected viscera. Includes surface anatomy.

PT 701. Human Gross Anatomy II. 2 Hours.
A study of the anatomical structure of the human body includes limbs, back, abdominal wall and cavity. Specific emphasis includes regional study of the relationships between musculoskeletal, nervous, and vascular systems, joint structure, cardiovascular and pulmonary systems, and surveys of selected viscera.
Prerequisites: PT 700 [Min Grade: C]

PT 702. Functional Anatomy. 4 Hours.
Integrated study of anatomy, kinesiology, muscle biology, and biomechanics to develop an understanding of and ability to analyze normal and pathologic human movement. Includes palpation and surface anatomy.

PT 704. Analysis of Human Movement. 3 Hours.
Study of human movement through an examination of the movement patterns during common motor skills (eg: walking). The kinematics and kinetics related to movement will be studied across the lifespan.

PT 706. Neuroscience I. 3 Hours.
A study of structures and functions of the human nervous system with emphasis on sensory/motor function.

PT 707. Neuroscience II. 3 Hours.
Study of the theories of motor control and motor learning will serve as a foundation for the understanding how the CNS is organized in relation to human movement.

PT 710. Physical Therapy Intervention I. 3 Hours.
Introduction to the basic components of physical therapy practice applicable to those with acute and chronic conditions. Emphasis placed on basic procedural interventions and equipment.

PT 711. PT Examination I. 2 Hours.
Introduction to the physical therapy examination process. Emphasis on exploring the human movement system as the foundation of patient/client management.

PT 712. Physical Therapy Examination II. 3 Hours.
Continuation of Physical Therapy I with focus on knowledge and skills needed to test and measure strength, range of motion, and posture.

PT 714. Physical Therapy Intervention II. 3 Hours.
Procedures and techniques for the design and implementation of fundamental therapeutic exercise; recognizing impairments in body function and structure and activity limitations amenable to physical therapy; students will utilize therapeutic exercise interventions for prevention and rehabilitation of movement dysfunction and disability.

PT 715. Physical Therapy Intervention III. 3 Hours.
The study and use of knowledge and skills needed to select and use both electrodiagnostic and electrotherapeutic modality interventions for various impairments and functional limitations. Emphasis will be placed on integrating electrical evaluation, electrical and deep heat therapy with previously learned examination, evaluation, and intervention skills. An overview of integument system repair and the management of chronic wounds will be discussed with an emphasis on examination, clinical decision making, and intervention.

PT 716. Clinical Evaluation in Physical Therapy. 3 Hours.
Study of comprehensive clinical evaluation concepts through use of the International Classification of Function, Disability and Health (ICF) model framework with application in health conditions across the lifespan.

PT 720. Pathology and Pharmacology for Movement Disorders I. 3 Hours.
Overview of clinical medicine related to management of movement disorders. Basic principles of pathology and pharmacology. Explores physical therapy implications associated with medical and surgical management of disorders with emphasis on clinical manifestations, management, and physical therapy implications.

PT 721. Pathology and Pharmacology for Movement Disorders II. 3 Hours.
Exploration of medical and surgical disorders with emphasis on clinical manifestations, management, and physical therapy implications.

PT 730. Essentials of Human Physiology. 3 Hours.
Fundamental principles and concepts of human physiology are covered regarding cell physiology, the cardiovascular, endocrine, gastrointestinal, pulmonary, renal, and skeletal muscle systems as well as thermo-regulation of the body. Both cellular and systemic issues are addressed with an emphasis on a mechanistic and integrative approach to understanding function.

PT 731. Human Performance Physiology. 3 Hours.
Course provides fundamental knowledge about the adaptability of human physiological systems in meeting a range of exercise demands. Areas covered include energy transfer during rest and exercise, physiologic and performance adaptations, exercise prescription for healthy adults, and body composition. Research evidence regarding how exercise and physical activity impact health, wellness, and disease is included.

PT 740. PT Management of Musculoskeletal Dysfunction I. 5 Hours.
Application of biological and physical sciences in understanding musculoskeletal disorders. Diagnosis of common musculoskeletal dysfunctions; clinical decision making concerning treatment and prevention of musculoskeletal disorders. Medical and surgical diagnostic and treatment procedures with implications for rehabilitation. Focus for one course is on the lower quarter and the thoracic spine; focus of the other course is on the upper quarter.

PT 741. PT Management of Musculoskeletal Dysfunction II. 5 Hours.
Application of biological and physical sciences in understanding musculoskeletal disorders. Diagnosis of common musculoskeletal dysfunctions; clinical decision making concerning treatment and prevention of musculoskeletal disorders. Medical and surgical diagnostic and treatment procedures with implications for rehabilitation. Focus for one course is on the lower quarter and the thoracic spine; focus of the other course is on the upper quarter.

PT 743. PT Management of Cardiopulmonary Dysfunction. 4 Hours.
Physical therapy examination, evaluation, diagnosis, prognosis, and intervention for patients with primary and secondary disorders involving the cardiovascular/pulmonary system.

PT 744. PT Management of Neuromuscular Dysfunction I. 3 Hours.
Application, analysis, and synthesis of principles of neuromuscular rehabilitation in physical therapy examination, evaluation, diagnosis, and intervention.

PT 746. PT Management of Neuromuscular Dysfunction II. 5 Hours.
Application, analysis and synthesis of principles of neuromuscular rehabilitation in physical therapy examination, evaluation, diagnosis, prognosis and intervention.

PT 750. Physical Therapy Management of Neuromuscular Dysfunction I. 3 Hours.
Application, analysis, and synthesis of principles of neurophysiologic rehabilitation in physical therapy examination, evaluation, diagnosis, prognosis, and intervention.

PT 751. Physical Therapy Management of Adults with Neuromuscular Dysfunction II. 3 Hours.
Application, analysis, and synthesis of principles of neurophysiologic rehabilitation in physical therapy examination, evaluation, diagnosis, prognosis, and intervention.

PT 752. Physical Therapy Management of Pediatric Conditions. 3 Hours.
Managing pediatric conditions throughout the lifespan. Emphasis will be placed on examination, evaluation, diagnosis, prognosis, interventions, and outcomes.

PT 760. PT Professional Practice I. 2 Hours.
Introduction to the profession of physical therapy, including history, APTA, and scope of practice. Introduction to legal, ethical and other regulatory mechanisms that guide the practice of physical therapy. Presentation of cultural diversity issues related to physical therapy practice.

PT 761. PT Professional Practice II. 3 Hours.
Synthesis and application of regulatory mechanisms, legal mandates and ethical principles and theories to issues facing the physical therapy student and the physical therapist functioning in a multifaceted role; values clarification and decision making related to current professional issues. Strategies for dealing with diverse cultures and conflict. Utilization of documentation strategies to promote effective physical therapy practice and payment.

PT 762. PT Professional Practice III. 3 Hours.
Forces contributing to the health care environment and the effects of this environment on physical therapy practice, research and education. Concepts of health promotion (including wellness and patient education) and the role of the physical therapist in promoting healthy lifestyles in the health care and community settings. Theoretical basis for health behaviors and application of theories to physical therapy practice. Concepts of consultation, program planning, implementation, and evaluation applied to health promotion-oriented physical therapy programs.

PT 763. PT Professional Practice IV. 2 Hours.
Study of management and supervisory principles and current issues related to physical therapy practice: Practical concepts of marketing , organizational structure, fiscal management, facility planning, design and entrepreneurship.

PT 764. Professional Practice V - Capstone Experience. 2 Hours.
Integration of all previous coursework applied to reflection of the scope of physical therapy practice: direct patient care, professional growth/ development, professional issues, education, consultation, evidence based practice (EBP), communication and cultural competency. Development and presentation of an individual portfolio that reflects core values, personal and professional growth and accomplishments, and appropriate plans for future professional development.

PT 770. Clinical Education. 1-9 Hour.
Supervised clinical education in patient care skills and practice issues related to physical therapy.

PT 778. Special Topics in Physical Therapy. 1-9 Hour.
Exploration of current issues in Physical Therapy.

PT 790. Scientific Inquiry I. 1-2 Hour.
Introduction to sources of evidence; measurement principles, experimental design, and basic statistical concepts are combined to build analytical skills required for evidence-based practice.

PT 791. Scientific Inquiry II. 2 Hours.
This course combines concepts of measurement principles, experimental design, qualitative, survey outcomes research and a review of basic statistical concepts that will prepare the graduate to critically analyze and use the scientific literature to improve clinical practice. Emphases will be placed on understanding the components of a research report and the concepts associated with judging quality of research design as applied to clinical practice.

PT 798. Doctoral Level Non-Thesis Research. 1-9 Hour.
Implementation of project activities with data collection, analysis, and preparation of manuscript of scholarly activity project. Student and mentor work together to identify specific project components to be completed during each specific term the course is taken.

School of Medicine

At UAB, we're training the next generation of physicians and physician-scientists, answering basic scientific questions that lead to medical innovations and bringing the best medical care to bear for our patients.

UAB is an integral part of Birmingham and the region, and Birmingham is integral to UAB. The Birmingham campus is within walking distance of some of the best parks, entertainment and dining in the region. Our regional campuses—in Huntsville, Montgomery and Tuscaloosa—expand our academic reach and responsibilities, helping educate physicians in rural and underserved areas of the state.

The School of Medicine has approximately 750 students, 900 residents and 1,300 full-time faculty in 26 academic departments. We are the home of The Kirklin Clinic, a multi-disciplinary medical home; University Hospital, one of the largest academic hospitals in the country; and our faculty serve the Children's of Alabama hospital.

Interdisciplinary Academic Programs

UAB offers a **NIH-funded Medical Scientist Training Program** (MSTP), a combined MD/PhD program designed to prepare students for careers that combine laboratory investigation of disease mechanisms with the practice and teaching of clinical medicine in an academic setting. The Gerontology Education Certificate Program was established in 1980 through the cooperative efforts of the School of Social and Behavioral Sciences and the Center for Aging. Since that time, the program has expanded considerably and offers diverse academic opportunities. Students have access to a number of faculty members from multiple disciplines who bring research and academic expertise to the study of aging and the aged.

Marnix E. Heersink Institute for Biomedical Innovation Graduate Programs

The Heersink Institute offers graduate certificate and masters degree programs to meet the needs of innovation and digital-minded clinicians, leaders and scholars.

Certificate Programs

Digital Healthcare Certificate (p. 462)

Artificial Intelligence in Medicine (p. 463)

Translation of Biomedical Innovation to Clinical Practice (p. 464)

BMEM-Biomedical Engineering Courses

BMEM 601. Biomedical Innovation and Clinical Translation I. 3 Hours.
This lecture and team-based project focused course will provide a detailed overview of the device design process and focus on important issues to be considered for successful translation of preliminary designs into viable clinical products. This course will include a final team-based project focused on a providing a biomedical device for a hypothetical problem selected by the group.

BMEM 602. Biomedical Innovation and Clinical Translation II. 3 Hours.
This lecture and team-based project will be a continuation of BME-M 601. The business and commercialization aspects of a marketable design will be explored. This course will focus on the important business issues to be considered for successful translation of preliminary designs into viable clinical products. This course will include a final team-based presentation (with an accompanying report) to obtain funding from investors.

BMEM 603. Regulatory, Legal and Ethical Perspectives. 3 Hours.
This lecture and team-based project will be a continuation of BME-M 602. The regulatory, legal, and ethical aspects of a marketable design will be explored; specifically how this will modify the final marketable design. This course will include a final team-based oral and written presentation (accompanying report) to include information necessary for an FDA submission as well as an updated commercialization plan to give to investors.

BMEM 610. Design and Regulation of Stem Cell and Tissue Engineered Products. 3 Hours.
The overall objective of this course is to provide a broad introduction to regenerative and therapeutic strategies enabled using stem cells and tissue engineering. This course will provide an overview of the different types of stem cells, discuss their potential for regenerative medicine and cellular therapeutics, introduce basic concepts in tissue engineering, and discuss regulatory and ethical issues associated with the use of stem cells and tissue-engineered products.

BMEM 611. Biomedical Device Design. 3 Hours.
This design course focuses on the development of solutions to clinical problems that require the use of implants and medical devices. Topics covered include a detailed overview of the design process of implants and biomedical devices including the role of stress analysis in the design process; anatomic fit, shape and size of implants; selection of bio-materials; instrumentation for surgical implantation procedures; pre-clinical testing for safety and efficacy, risk assessment evaluation of clinical performance and design of clinical trials.

BMEM 612. Lab-on-a-chip and Point-of-Care Diagnostic Technologies. 3 Hours.
This course will introduce lab-on-a-chip (LOC) technologies used for point-of-care (POC) diagnostics. Specifically, this course will detail design considerations, fabrication techniques, current advances in sensing and detection, data acquisition and analysis, and quality control. This course will also provide an overview of regulatory challenges associated with the development and approval of these technologies for use in patients. Finally, this course will provide examples of point-of-care technologies classified based on clinical use and clinical setting.

BMEM 613. Implantable Devices and Biomaterials. 3 Hours.
The overall objective of this course is to provide a comprehensive review of tissue-material interactions to guide the design on biomedical devices for in-vivo transplantation. Specific topics will include an overview of commonly used bio-materials, their interactions with blood and the immune system and strategies to prevent unwanted tissue responses and promote beneficial responses.

BMEM 614. Wearable Device Technologies. 3 Hours.
The overall objective of this course is to provide a comprehensive overview of currently used wearable devices, provide a basic understanding of the current technologies, their advantages for continuous patient monitoring and current limitations. This course will also provide a broad overview of potential new markets and opportunities for wearable devices over the next decade.

BMEM 615. Design and Use of Tissue Chips, Organ Chips & Microphysiological Systems. 3 Hours.
The overall objective of this course is to provide a an introduction to human tissue chips and microphysiological systems that are poised to replace animal based drug testing with human in-vitro model based approaches. This course will outline the basics of tissue chips and complex microphysiological systems, provide an overview of current state of the field, outline limitations and challenges and discuss potential opportunities for disease modeling, drug discovery and drug toxicity testing.

BMEM 616. Direct Reprogramming 101. 3 Hours.
Dysfunction or degradation of cells in our body leads to devastating human disorders. The discovery of direct reprogramming opens the avenue to (re)generate the desired cell types for both research purposes and disease treatment. This course will cover the history and biological basis of direct reprogramming, outline direct reprogramming achieved in different cell types, and their implications in answering basic biomedical questions and treating human diseases. We will also overview the current state of the field and discuss the obstacles and potential opportunities to be applied with other bioengineering technologies.

BMEM 617. Pain Management. 3 Hours.
The overall objective of this course is to provide a an introduction to human disease with pain. Pain management is an aspect of medicine and health care involving relief of pain in various dimensions, from acute and simple to chronic and challenging. Effective pain management does not always mean total eradication of all pain. Rather, it often means achieving adequate quality of life in the presence of pain, through any combination of lessening the pain and/or better understanding it and being able to live happily despite it.

HCI-Healthcare Innovation Courses

HCI 611. Foundations of Artificial Intelligence in Medicine. 3 Hours.
This course introduces students to the fundamentals needed for implementing Artificial Intelligence (AI) in clinical settings. Introduction to AI, Introduction to Healthcare System and Clinical data and Introduction to tools and techniques used in AI.

HCI 612. Applications of Artificial Intelligence in Medicine. 3 Hours.
This course introduces students to Applications of AI in medicine, Machine Learning- Applications of AI to EHR data, Deep Learning- Applications of AI to Medical Imaging data, and Natural Language Processing- Applications of AI to Clinical Documentation.
Prerequisites: HCI 611 [Min Grade: C](Can be taken Concurrently) or HCI 611 [Min Grade: C](Can be taken Concurrently)

HCI 613. Leadership and Ethics for Artificial Intelligence in Medicine. 3 Hours.
This course introduces students to leadership, ethical and strategic skills, responsible AI, AI strategy, people, organization, and implementation of AI in medicine.
Prerequisites: HCI 611 [Min Grade: C](Can be taken Concurrently) or HCI 611 [Min Grade: C](Can be taken Concurrently)

HCI 614. Integration of Artificial Intelligence into Clinical Workflow. 3 Hours.
This course introduces students to strategies and processes for integrating AI into existing clinical workflows. Using AI for Medical Diagnosis, Using AI for Medical Prognosis, and Using AI for Medical Treatment.
Prerequisites: HCI 611 [Min Grade: C](Can be taken Concurrently) or HCI 611 [Min Grade: C](Can be taken Concurrently)

HCI 641. Foundations of Digital Health. 3 Hours.
This course introduces students to the basic concepts needed for implementing digital health solutions in health care. Digital Health Concepts and Key Components, Digital Health Technologies, and Digitally Enabled Care Models.

HCI 642. Leadership & Ethics for Digital Health. 3 Hours.
This course introduces students to leadership, ethical and strategic skills for digital health. Business and Commercialization Strategies, Ethics, Digital Health Technology Assessment.
Prerequisites: HCI 641 [Min Grade: C](Can be taken Concurrently) or HCI 641 [Min Grade: C](Can be taken Concurrently)

HCI 643. Special Topics for Digital Health. 3 Hours.
This course introduces students to special topics in digital health including blockchain in health care, mixed reality in health care and data science for digital health.

HCI 644. Health Care Innovation and Management. 3 Hours.
This course introduces students to the concepts of healthcare innovation and builds knowledge of managing healthcare innovations, fostering an innovative culture in healthcare settings, and assessing and prioritizing innovation from a strategic perspective.

HCI 645. The Organization of Healthcare Innovation. 3 Hours.
This course exposes students to organizational theories and practice related innovation. The course specifically builds knowledge and skills in analyzing the healthcare innovation case using organizational theories, as well as evaluating possibilities and limitations of organizational theories in encouraging and sustaining innovation.

HCI 646. Business Skills for Healthcare Innovation. 3 Hours.
This course provides in-depth knowledge and skills in the financial aspects of healthcare innovation, analyzing healthcare markets and marketing and considerations for start-ups and social enterprises in healthcare.

HCI 647. Healthcare Innovation Metrics and Assessment. 3 Hours.
This course builds student knowledge and skills in economic approaches to health care evaluations, health technology assessment, cost-benefit analysis, and application of health economic approaches to analyze healthcare innovations.

HCI 648. New Technologies and Healthcare. 3 Hours.
This course develops student knowledge of emerging technologies in healthcare including but not limited to digital health innovations, Al and Robotics, Internet of Things and Biosensors.

HCI 649. Design Thinking in Healthcare. 3 Hours.
Design Thinking and Innovation will teach you how to leverage fundamental design thinking principles and innovative problem-solving tools to address business challenges and build products, strategies, teams, and environments for optimal use and performance.

HCI 650. Making New Healthcare Markets. 3 Hours.
This course focuses on how to identify and capitalize upon marketplace design opportunities. Defines markets and marketplaces and describes the basic functions of each. Discusses attributes (e.g., heterogeneity of participants' preferences and asymmetry in available information) that determine whether and how marketplaces create value. Explains common causes of market failure; presents a framework for designing marketplaces in response. Discusses tactics for building trust and liquidity when launching new market places as well as challenges encountered as marketplaces mature (e.g. congestion and disintermediation).

HCI 685. Healthcare Innovation Practicum I. 3 Hours.
This course consists of a group project and of classes addressing issues typically encountered in health care innovation projects in companies, start-up or in the health care provider organizations. Examples of these issues are concerned with innovation design, needs analysis, development of value propositions, markets and pricing of medical products, or issues in organizational implementation of innovation. Students focus on a specific innovation challenge in a specific company or health provider organization (typically a hospital). The project carries out fieldwork in its host organization to obtain the most fruitful problem statement, to collect data and to present and discuss solutions.

HCI 686. Hlthcre Innovation Prac II. 3 Hours.
This course consists of a project addressing issues typically encountered in health care innovation projects in companies, start-up or in the health care provider organizations. Examples of these issues are concerned with innovation design, needs analysis, development of value propositions, markets and pricing of medical products or issues in organizational implementation of innovation. Students focus on a specific innovation challenge in a specific company or health provider organization. The students carry out field work in its host organization to obtain the most fruitful problem statement, to collect data and to present and discuss solutions.

PSDO - Physician Scientist Dev Courses

PSDO 630. Physician Experience. 2 Hours.
PSDO 630 will provide practical information and experience for highly qualified students considering medical school or other health-care based professional programs. The course will emphasize real world considerations of the clincial professions including acceptance criteria, expected duration of training, average debt and compensation of various specialties. The students will also be given multiple opportunities to interact with individuals from various levels of training and backgrounds to provide focused and nuanced guidance. Finally, the course will incorporate a shadowing experience, providing students the opportunity to observe and interact with practitioners from across UAB in a variety of specialties and settings. Each student will be required to complete documentation for the UAB and Children's hospital, as well as receiving clearance from UAB Employee Health, as well as completing an online HIPAA compliance module. Students are not permitted to shadow until each is complete.

PSDO 698. Master's Level Non-Thesis Research. 1-8 Hour.
Students may perform independent study in a research laboratory setting. This work may contribute toward the concentration credits subject to program director approval.

PSDO 699. Master's Level Thesis Research. 1-8 Hour.
Students perform independent study in a research laboratory setting. This work contributes directly to the completion of the degree and meets the degree requirements for graduation.

PSDO 700. Pathway to Grant Submission. 2 Hours.
This course is designed to give students a basic background in topics necessary to succeed as a physician scientist in today's academic medical environment. Topics to be covered include the NIH funding system, how to write a fellowship, record keeping, authorship and publication, conflict of interest, animal and human subjects, and finding a mentor (Open to MD-PhD, ARISE-MD, and DMD-PhD students).

PSDO 701. Career Development Grant Writing Workshop. 1 Hour.
This course is designed to assist postdocs, residents, fellows, and rising junior faculty with the creation and submission of a K award or equivalent grant application. Topics to be covered include the NIH funding system, how to write a fellowship, how to submit animal protocols, and how to submit IRB forms. Individuals will be given a variety of reading assignments from which they will be expected to participate in group discussions and/or presentations. They will also be expected to prepare a fellowship application that will be submitted to an NIH Funding agency.

PSDO 720. Critical Approaches & Clinical Evaluation of Kidney Disease. 1 Hour.
Enhance knowledge of kidney disease physiology to include expansion of the themes from the Mount Desert Island Biologic Laboratory (MDIBL) course on the "Origins of Renal Physiology" Promote structured critical thinking skills focused on kidney disease. Enhance experimental design skills for the development and testing of new hypotheses. Enhance constructive reviewing skills. Engage in the culture and language of medicine through exposure to a range of clinical experiences. Provide opportunities for PROmoTE scholars and clinical faculty to discuss areas where basic science and clinical medicine intersect and where new information could be beneficial. Expose PROmoTE scholars to clinical problems and a variety of team-based investigation.

PSDO 798. PSDO Non-Dissertation Research. 1-8 Hour.
Non-Dissertation research. Only open to ARISE-MD students.

PSDO 799. PSDO Dissertation Research. 1-8 Hour.
Dissertation research. Only open to ARISE-MD students.
Prerequisites: GAC Z

Graduate Certificate in Digital Healthcare

The Graduate Certificate in Digital Healthcare is an online graduate certificate program that will provide a unique credential that will help entrepreneurs, graduate students, medical students, scientists, physicians and others. The certificate offers an educational foundation that will help graduates navigate the complex digital transformation of health care and medicine. Courses will apply toward the Masters of Healthcare Innovation. Certificates may be combined to obtain an Interdisciplinary Master's Degree.

Courses are held asynchronously with optional weekly synchronous sessions.

The Graduate Certificate in Digital Healthcare is awarded by the University of Alabama at Birmingham Heersink School of Medicine.

Admission Requirements:

Admission requirements include eligibility for admission to the UAB Graduate School. There is no GRE required. An admissions committee reviews applications and makes final decisions. Students may begin the program in the Fall or Spring semesters.

Required Coursework:

Graduate Certificate in Digital Healthcare

Requirements		Hours
HCI 641	Foundations of Digital Health	3
HI 657	Human-centered Research Design Methods for Healthcare	3
HCI 642	Leadership & Ethics for Digital Health	3

HCI 643	Special Topics for Digital Health	3
HI 620	Security and Privacy in Health Care	3
Total Hours		**15**

Artificial Intelligence in Medicine

The Graduate Certificate in AI in Medicine provides a unique credential that will help physicians, entrepreneurs, students, and scientists become knowledgeable about the growing and influential field of artificial intelligence in medicine. The certificate emphasizes the practical application and integration of artificial intelligence principles and tools to design and implement effective approaches for improving health of people through increased precision in predictive modeling, improved diagnostics and other advances.

Courses will apply toward the Masters of Healthcare Innovation. Certificates may be combined to obtain an Interdisciplinary Master's Degree.

Courses are held asynchronously with optional weekly synchronous sessions.

The Graduate Certificate in AI in Medicine is awarded by the University of Alabama at Birmingham Heersink School of Medicine.

Admission Requirements:

Admission requirements include eligibility for admission to the UAB Graduate School. There is no GRE required. An admissions committee reviews applications and makes final decisions. Students may begin the program in the Fall or Spring semesters.

Required Coursework:

Graduate Certificate Artificial Intelligence in Medicine

Requirements		Hours
HCI 611	Foundations of Artificial Intelligence in Medicine	3
HCI 612	Applications of Artificial Intelligence in Medicine	3
HCI 613	Leadership and Ethics for Artificial Intelligence in Medicine	3
HCI 614	Integration of Artificial Intelligence into Clinical Workflow	3
HI 620	Security and Privacy in Health Care	3
Total Hours		**15**

Courses

HCI 611. Foundations of Artificial Intelligence in Medicine. 3 Hours.
This course introduces students to the fundamentals needed for implementing Artificial Intelligence (AI) in clinical settings. Introduction to AI, Introduction to Healthcare System and Clinical data and Introduction to tools and techniques used in AI.

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This course introduces students to Applications of AI in medicine, Machine Learning- Applications of AI to EHR data, Deep Learning- Applications of AI to Medical Imaging data, and Natural Language Processing- Applications of AI to Clinical Documentation.
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HCI 647. Healthcare Innovation Metrics and Assessment. 3 Hours.
This course builds student knowledge and skills in economic approaches to health care evaluations, health technology assessment, cost-benefit analysis, and application of health economic approaches to analyze healthcare innovations.

HCI 648. New Technologies and Healthcare. 3 Hours.
This course develops student knowledge of emerging technologies in healthcare including but not limited to digital health innovations, Al and Robotics, Internet of Things and Biosensors.

HCI 649. Design Thinking in Healthcare. 3 Hours.
Design Thinking and Innovation will teach you how to leverage fundamental design thinking principles and innovative problem-solving tools to address business challenges and build products, strategies, teams, and environments for optimal use and performance.

HCI 650. Making New Healthcare Markets. 3 Hours.
This course focuses on how to identify and capitalize upon marketplace design opportunities. Defines markets and marketplaces and describes the basic functions of each. Discusses attributes (e.g., heterogeneity of participants' preferences and asymmetry in available information) that determine whether and how marketplaces create value. Explains common causes of market failure; presents a framework for designing marketplaces in response. Discusses tactics for building trust and liquidity when launching new market places as well as challenges encountered as marketplaces mature (e.g. congestion and disintermediation).

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This course consists of a project addressing issues typically encountered in health care innovation projects in companies, start-up or in the health care provider organizations. Examples of these issues are concerned with innovation design, needs analysis, development of value propositions, markets and pricing of medical products or issues in organizational implementation of innovation. Students focus on a specific innovation challenge in a specific company or health provider organization. The students carry out field work in its host organization to obtain the most fruitful problem statement, to collect data and to present and discuss solutions.

Translation of Biomedical Innovation to Clinical Practice

This non-degree graduate certificate will provide both non-engineering and engineering graduate students with opportunities to gain knowledge, skills, and competencies required to translate basic science discoveries and new biomedical technologies into products in the clinical setting. Core courses will allow individuals to learn how to pursue a structured approach to accomplishing clinical translation of biomedical innovations along with knowledge pertaining to entrepreneurial, commercialization and regulatory pathways. Technical electives are intended to familiarize individuals with cutting-edge technologies that form the basis for biomedical products.

Translation of Biomedical Innovations to Clinical Practice Certificate

Requirements		Hours
BMEM 601	Biomedical Innovation and Clinical Translation I	3
Select a Technical Elective from the list below:		3
BMEM 610	Design and Regulation of Stem Cell and Tissue Engineered Products	
BMEM 611	Biomedical Device Design	
BMEM 612	Lab-on-a-chip and Point-of-Care Diagnostic Technologies	
BMEM 602	Biomedial Innovation and Clinical Translation II	3
Select a Technical Elective from the list below:		3
BMEM 613	Implantable Devices and Biomaterials	
BMEM 614	Wearable Device Technologies	
BMEM 615	Design and Use of Tissue Chips, Organ Chips & Microphysiological Systems	
BMEM 603	Regulatory, Legal and Ethical Perspectives	3
Total Hours		**15**

ARISE MD

OVERVIEW

The **Advance Research training In SciEnce for MDs (ARISE-MD) PHD** at UAB is a physician scientist training pathway designed to prepare residents and fellows at UAB for the roles of researchers, scholars and leaders capable of making a substantive contribution to academic medicine. The ARISE-MD pathway is designed to build on previous training at the undergraduate medical education level obtained from a nationally accredited school of medicine. The multi-year program offers future clinician-scientists a pathway that combines clinical training with advanced research training in multiple arenas of basic science leading to a PhD degree from one of eight Graduate Biomedical Science (GBS) PhD themes. It is through immersion in a research project that ARISE-MD students gain the knowledge and skills required for the successful completion of a dissertation. Residents or fellows from any graduate medical education (GME) training program at UAB can apply to the ARISE-MD.

PROGRAM OUTCOMES

- Synthesize historical and philosophical knowledge as a foundation for the design and conduct of research that generates new knowledge
- Critically appraise and synthesize evolving knowledge as a foundation for a scientific program of research
- Generate knowledge that informs the design, implementation, and evaluation of interventions that contribute to the advancement of science and facilitate optimal patient, population, and health systems outcomes
- Conduct investigations based upon scientifically sound conceptual and methodological decisions about research designs, measures, and analytic methods
- Demonstrate scientific integrity in the design, conduct, and dissemination of research
- Participate in the mentoring of the next generation of physician scientists

ARISE-MD MINIMUM ADMISSION REQUIREMENTS

- A Doctor of Medicine (MD) from a nationally accredited institution, equivalent to that in the UAB School of Medicine
- Eligibility for licensure as a physician in Alabama
- Active resident or fellow matched at UAB through the UASOM Graduate Medical Education Office (**ERAS Application and Match Acceptance**)
- A personal statement that evidences prior research experiences, congruence between the applicant’s research interests and chosen

mentor's research, and future endeavors as a physician scientist in academic medicine

- A current CV or NIH Biosketch
- Two references from individuals with expertise to comment on the applicant's capability for research and scholarship (e.g., research mentor and UAB Residency or Fellow Chair)
- A personal interview with an ARISE-MD advisory member or designee

Biochemistry & Structural Biology (BSB) Theme - MSTP/ARISE

Requirements		Hours
Module Courses [1]		**8**
Theme Required Course		**6**
GBSC 742	GBS Student Theme Meeting Course [2]	
GBS Required Courses		**23**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [3]		
Biostatistics [4]		
Journal Clubs [5]		
Three Advanced Courses [6]		
MSTP/ARISE Required Courses		**39**
MSTP 794	Translational Research Seminar [7]	
MSTP 795	Continuing Clinical Education [8]	
Research [9]		
Total Hours		**76**

1. Four modular courses selected from the following: GBS 710, GBS 712, GBS 714, GBS 720, GBS 724, GBS 740A, GBS 740B, GBS 741, GBS 744, GBS 750, GBS 751, GBS 752, GBS 753, GBS 760, GBS 762, GBS 763, GBS 764, GBS 769, GBS 770, GBS 774, GBS 781, GBS 782, GBS 784, GBSC 718, GBSC 727, GBSC 729, GBSC 744, GBSC 747
2. Required each fall and spring semester
3. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course
4. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course
5. Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
6. Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.
7. Required every semester
8. Required each fall and spring semester
9. Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Cancer Biology (CANB) Theme - MSTP/ARISE

Requirements		Hours
Module Courses		**8**
GBS 710	Cell Signaling	
GBS 769	Carcinogenesis	
GBS 770	Pathobiology of Cancer	
GBS 774	Cancer Immunology	
Theme Required Courses		**6**
GBS 777	Cancer Biology Seminar [1]	
GBS Required Courses		**23**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [2]		
Biostatistics [3]		
Journal Clubs [4]		
Three Advanced Courses [5]		
MSTP/ARISE Required Courses		**39**
MSTP 794	Translational Research Seminar [6]	
MSTP 795	Continuing Clinical Education [7]	
Research [8]		
Total Hours		**76**

1. Required each fall and spring semester.
2. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course.
3. Course selected from GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course.
4. Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
5. Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726 GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709,GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.
6. Required every semester.
7. Required each fall and spring semester.
8. Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Cell, Molecular & Developmental Biology (CMDB) Theme - MSTP/ARISE

Requirements		Hours
Module Courses [1]		**8**
Theme Required Courses		**7**
GBS 717	Methods and Scientific Logic	
GBS 792	CMDB Seminar [2]	
GBS Required Courses		**23**

	GRD 717 Principles of Scientific Integrity	
	Grant-Writing/Scientific Communication [3]	
	Biostatistics [4]	
	Journal Clubs [5]	
	Three Advanced Courses [6]	
MSTP/ARISE Required Courses		**39**
	MSTP 794 Translational Research Seminar [7]	
	MSTP 795 Continuing Clinical Education [8]	
	Research [9]	
Total Hours		**77**

1. Four modular courses selected from the following: GBS 710, GBS 712, GBS 714, GBS 720, GBS 724, GBS 740A, GBS 740B, GBS 741, GBS 744, GBS 750, GBS 751, GBS 752, GBS 753, GBS 760, GBS 762, GBS 763, GBS 764, GBS 769, GBS 770, GBS 774, GBS 781, GBS 782, GBS 784, GBSC 718, GBSC 727, GBSC 729, GBSC 744, GBSC 747
2. Required each fall and spring semester.
3. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course
4. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course.
5. Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
6. Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.
7. Required each semester
8. Required each fall and spring semester
9. Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Genetics, Genomics and Bioinformatics (GGB) Theme - MSTP/ARISE

Requirements		Hours
Module Courses [1]		**8**
Theme Required Courses		**7**
	GBS 717 Methods and Scientific Logic	
	GBSC 742 GBS Student Theme Meeting Course [2]	
GBS Required Courses		**23**
	GRD 717 Principles of Scientific Integrity	
	Grant-Writing/Scientific Communication [3]	
	Biostatistics [4]	
	Journal Clubs [5]	
	Three Advanced Courses [6]	
MSTP/ARISE Required Courses		**39**
	MSTP 794 Translational Research Seminar [7]	
	MSTP 795 Continuing Clinical Education [8]	
	Research [9]	
Total Hours		**77**

1. Four modular courses selected from the following: GBS 710, GBS 712, GBS 714, GBS 720, GBS 724, GBS 740A, GBS 740B, GBS 741, GBS 744, GBS 750, GBS 751, GBS 752, GBS 753, GBS 760, GBS 762, GBS 763, GBS 764, GBS 769, GBS 770, GBS 774, GBS 781, GBS 782, GBS 784, GBSC 718, GBSC 727, GBSC 729, GBSC 744, GBSC 747
2. Required each fall and spring semester
3. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course
4. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course.
5. Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
6. Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.
7. Required each semester
8. Required each fall and spring semester
9. Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Immunology (IMM) Theme - MSTP/ARISE

Requirements		Hours
Module Courses		**8**
	GBS 740A Introduction to Immunology Part 1	
	GBS 740B Introduction to Immunology Part 2	
	GBS 744 Mucosal Immunology	
	GBS 741 Lymphocyte Biology	
Theme Required Courses		**6**
	GBSC 742 GBS Student Theme Meeting Course [1]	
GBS Required Courses		**23**
	GRD 717 Principles of Scientific Integrity	
	Grant-Writing/Scientific Communication [2]	
	Biostatistics [3]	
	Journal Clubs [4]	
	Three Advanced Courses [5]	
MSTP/ARISE Required Courses		**39**
	MSTP 794 Translational Research Seminar [6]	
	MSTP 795 Continuing Clinical Education [7]	
	Research [8]	
Total Hours		**76**

1 Required each fall and spring semester
2 Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course
3 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course
4 Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
5 Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.
6 Required every semester
7 Required each fall and spring semester
8 Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Microbiology (MIC) Theme - MSTP/ARISE

Requirements		Hours
Module Courses		**8**
GBS 760	Bacterial Genetics and Physiology	
GBS 762	Virology	
GBS 764	Introduction to Structural Biology Methods	
GBS 763	Microbial Pathogenesis	
Theme Required Courses		**8**
GBS 768	Communicating Science: Reading, Writing and Presentation	
GBSC 742	GBS Student Theme Meeting Course [1]	
GBS Required Courses		**23**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [2]		
Biostatistics [3]		
Journal Clubs [4]		
Advanced Courses [5]		
MSTP/ARISE Required Courses		**39**
MSTP 794	Translational Research Seminar [6]	
MSTP 795	Continuing Clinical Education [7]	
Research [8]		
Total Hours		**78**

1 Required each fall and spring semester
2 Course selected from the following: PSDO 700, GBS 716, GBS 725, GBS 768, GBSC 726, GRD 709, or other approved course
3 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course
4 Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
5 Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course
6 Required every semester
7 Required each fall and spring semester
8 Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Neuroscience (NEURO) Theme - MSTP/ARISE

Requirements		Hours
Module Courses		**8**
GBSC 744	Neuroanatomy	
GBSC 729	Cell Neurophysiology	
GBS 714	Developmental Neuroscience	
GBSC 727	Neuro Systems	
Theme Required Courses		**9**
GBS 737	Neuro Student Summer Seminar Series [1]	
NBL 703	Nuerobiology Seminar Series [2]	
GBS Required Course		**23**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [3]		
Biostatistics [4]		
Journal Clubs [5]		
Three Advanced Courses [6]		
MSTP/ARISE Required Course		**39**
MSTP 794	Translational Research Seminar [7]	
MSTP 795	Continuing Clinical Education [8]	
Research Hours [9]		
Total Hours		**79**

1 Required each summer semester
2 Required each fall and spring semester
3 Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course
4 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course
5 Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793

6 Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course

7 Required every semester

8 Required each fall and spring semester

9 Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Pathobiology, Pharmacology, & Physiology (P [3]) Theme - MSTP/ARISE

Requirements		Hours
Module Courses		**8**
GBS 750	Intro to Physiology	
GBS 751	Intro to Physiology II	
GBS 752	Intro to Pathobiology	
GBS 753	Intro to Pharmacology & Toxicology	
Theme Required Courses		**6**
GBSC 742	GBS Student Theme Meeting Course [1]	
GBS Required Courses		**23**
GRD 717	Principles of Scientific Integrity	
Grant Writing/Scientific Writing [2]		
Biostatistics [3]		
Journal Clubs [4]		
Advanced Courses [5]		
MSTP/Arise Required Courses		**39**
MSTP 794	Translational Research Seminar [6]	
MSTP 795	Continuing Clinical Education [7]	
Research [8]		
Total Hours		**76**

1 Required each fall and spring semester

2 Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course

3 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course

4 Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793

5 Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course

6 Required every semester

7 Required each fall and spring semester

8 Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Courses

PSDO 630. Physician Experience. 2 Hours.
PSDO 630 will provide practical information and experience for highly qualified students considering medical school or other health-care based professional programs. The course will emphasize real world considerations of the clincial professions including acceptance criteria, expected duration of training, average debt and compensation of various specialties. The students will also be given multiple opportunities to interact with individuals from various levels of training and backgrounds to provide focused and nuanced guidance. Finally, the course will incorporate a shadowing experience, providing students the opportunity to observe and interact with practitioners from across UAB in a variety of specialties and settings. Each student will be required to complete documentation for the UAB and Children's hospital, as well as receiving clearance from UAB Employee Health, as well as completing an online HIPAA compliance module. Students are not permitted to shadow until each is complete.

PSDO 698. Master's Level Non-Thesis Research. 1-8 Hour.
Students may perform independent study in a research laboratory setting. This work may contribute toward the concentration credits subject to program director approval.

PSDO 699. Master's Level Thesis Research. 1-8 Hour.
Students perform independent study in a research laboratory setting. This work contributes directly to the completion of the degree and meets the degree requirements for graduation.

PSDO 700. Pathway to Grant Submission. 2 Hours.
This course is designed to give students a basic background in topics necessary to succeed as a physician scientist in today's academic medical environment. Topics to be covered include the NIH funding system, how to write a fellowship, record keeping, authorship and publication, conflict of interest, animal and human subjects, and finding a mentor (Open to MD-PhD, ARISE-MD, and DMD-PhD students).

PSDO 701. Career Development Grant Writing Workshop. 1 Hour.
This course is designed to assist postdocs, residents, fellows, and rising junior faculty with the creation and submission of a K award or equivalent grant application. Topics to be covered include the NIH funding system, how to write a fellowship, how to submit animal protocols, and how to submit IRB forms. Individuals will be given a variety of reading assignments from which they will be expected to participate in group discussions and/or presentations. They will also be expected to prepare a fellowship application that will be submitted to an NIH Funding agency.

PSDO 720. Critical Approaches & Clinical Evaluation of Kidney Disease. 1 Hour.
Enhance knowledge of kidney disease physiology to include expansion of the themes from the Mount Desert Island Biologic Laboratory (MDIBL) course on the “Origins of Renal Physiology” Promote structured critical thinking skills focused on kidney disease. Enhance experimental design skills for the development and testing of new hypotheses. Enhance constructive reviewing skills. Engage in the culture and language of medicine through exposure to a range of clinical experiences. Provide opportunities for PROmoTE scholars and clinical faculty to discuss areas where basic science and clinical medicine intersect and where new information could be beneficial. Expose PROmoTE scholars to clinical problems and a variety of team-based investigation.

PSDO 798. PSDO Non-Dissertation Research. 1-8 Hour.
Non-Dissertation research. Only open to ARISE-MD students.

PSDO 799. PSDO Dissertation Research. 1-8 Hour.
Dissertation research. Only open to ARISE-MD students.
Prerequisites: GAC Z

Gerontology

Certification Program Director:	Dr. Patricia L. Sawyer
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E-mail:	psawyer@uab.edu
Website:	www.aging.uab.edu

Program Information

The Gerontology Education Program was established in 1980 through the cooperative efforts of the School of Social and Behavioral Sciences and the Comprehensive Center for Healthy Aging. Since that time, the program has expanded considerably and offers diverse academic opportunities. Students have access to a number of faculty members from multiple disciplines who bring research and academic expertise to the study of aging and the aged.

The Gerontology Education Program offers multidisciplinary academic courses in gerontology leading to a graduate certificate. The study of gerontology at these levels is designed to provide people educated in various disciplines with the background needed to work in programs related to aging and the aged. The main goals are to provide students with a thorough background in existing theory and research in gerontology, and a supplement to their existing backgrounds and professional disciplines. We have designed the program to prepare students for leadership roles in this field of growing importance for both the private and public sectors. Our program's curriculum integrates research, theory, and practice. Its multidisciplinary approach reflects the urban mission of UAB.

The program office is located at the UAB Comprehensive Center for Healthy Aging. This academic program is administered by the Director of the Gerontology Education Program, who also serves as Chair of the Guidance Committee on Graduate and Undergraduate Education in Gerontology. This committee is made up of representatives of academic departments and schools throughout the UAB campus active in the study of aging and the aged. The multidisciplinary gerontology program is offered to all UAB students in good standing with the sponsorship and support of the School of Social and Behavioral Sciences, the School of Health Related Professions, and the Comprehensive Center for Healthy Aging.

Student Admissions and Advisement

Although general advisement is handled through UAB student advising and parent departments, student advisement in gerontology is handled formally by the Director of the Gerontology Education Program. The director facilitates student advisement with other members of the Committee on Graduate and Undergraduate Education in Gerontology. A graduate specialty is offered to students who want a special emphasis in gerontology or geriatrics. The major objective of this specialization is to provide a strong academic background for professional careers in academic and aging-related settings. There are two avenues for undertaking the graduate gerontology certificate requirements. Students in good standing in the graduate school can specialize in gerontology through their primary department. Letters of application also are accepted from students who have already completed requirements for an advanced or professional degree.

Students not currently enrolled in a graduate program at UAB may petition the university for non-degree admission status. Once accepted, the student can undertake a course of study to receive a graduate certificate upon completion of the required sequence of classes.

A careful review of proposed curriculum is recommended before the student enrolls for gerontology study. This will give students an opportunity to receive initial advisement while reviewing available study plans and course schedules.

Requirements

Students must complete at least 15 credit hours of graduate-level work in gerontology or geriatrics, achieving a grade of B or better in each course. The curriculum consists of a required multidisciplinary course offered through the graduate school (GRD 600) or the completion of an aging course from each of the following departments: biology, psychology and sociology, and gerontology electives chosen from a roster of courses approved by the Committee on Graduate and Undergraduate Education in Gerontology, and a required research project or a relevant internship. To ensure a multidisciplinary perspective, courses must represent at least two departments.

Additional Information

For detailed information, contact Dr. Patricia L. Sawyer, Director, UAB Gerontology Education Program, Center for Aging, Room 201-E1, 933 19th Street South, Birmingham, AL 35294-2041.
Telephone 205-934-9261
Fax 205-934-7354
E-mail psawyer@uab.edu

Courses

GER 540. Biology of Aging. 3 Hours.

GER 590. Seminar in Sociological Substantive Areas. 1-3 Hour.

GER 593. Educational Gerontology. 3 Hours.

GER 595. Independent Study in Longterm Care. 1-3 Hour.

GER 603. Politics of Aging. 3 Hours.
Analysis of the role of aging in the political process. Focus on political demands made by elderly, role of aging in political decision making, and policy outputs relevant to older population.

GER 610. Health and Economics of Aging. 3 Hours.
Overview of economic aspects of aging focusing on the role of health and health care in the United States. The financing of health care for the aged will be the primary topic of the course. The economic factors influencing formal and informal sources of long term care also will be addressed. A final topic will be the role of health in retirement decisions and pension policies.

GER 611. Managed Care. 3 Hours.
Examination of factors that influence future direction of managed care. Changing relationships among major stakeholders. Broad areas of discussion including marketing dynamics, product characteristics, reimbursement methodologies, contracting issues, management information systems, governmnet initiatives, legal and ethical issues, and future trends. 3.000 Credit Hours.

GER 638. Gerontology and Geriatrics Multidisciplinary Core. 3 Hours.
The curriculum consists of lectures and discussions sessions on the multidisciplinary treatment of health and aging.

GER 643. Long-Term Care Administration. 3 Hours.
Seminar analysis of effect of chronic conditions and aging on delivery of health services, nursing homes and alternatives, mental health facilities and agencies, and rehabilitation facilities and services. Field trips and individual research projects. 3.000 Credit Hours.

GER 655. Minority Aging. 3 Hours.

GER 665. Geriatric Rehabilitation for the Health Profession. 3 Hours.
Rehabilitation of the eldery person from the perspective of age-related changes, the impact of selected functional problems, psychosocial aspects of dereasing function, personal and environmental adaptations, and the continuing autonomy of the individual.

GER 680. Health Promotion for the Aged. 2 Hours.
Problems and public health solutions for older Americans examined. Sub-areas of aging are explored; biological, social, behavioral, and economic aspects of aging.

GER 690. Independent Study in Gerontological Nursing. 1-3 Hour.

GER 691. Seminar in Gerontological Substantive Areas. 1-3 Hour.
Seminar in Gerontological Substantive Areas.

GER 734. International Medical Sociology. 3 Hours.
Cross-cultural, comparative analysis of health and health care delivery systems in both industrialized and developing countries.

GER 738. Gerontology and Geriatrics Multidisciplinary Core. 3 Hours.
Gerontology and geriatrics multidisciplinary core.

GER 755. Race and Ethnic Relations. 3 Hours.
Income inequality, school and residential segregation, intermarriage, and interracial crimes.

GER 759. Social Gerontology. 3 Hours.
Structural and behavioral implications of older adulthood. Relationships of aged to political, economic, educational, medical, religious, and other structures in society.

GER 760. Sociology of Death and Dying. 3 Hours.
Sociological, social psychological and existential perspectives on death and dying; recent trends in definition, distribution, and practices surrounding death and dying.

GER 769. Sociology of the Life Cycle. 3 Hours.
Theories of life; social construction of age categories, aging and family life, work, careers, and aging; men, women, and life cycle.

GER 777. Demography of Health and Aging. 3 Hours.
Focus on demographic processes, such as mortality, morbidity, migration, and fertility; how each influences number and proportion of elderly; how such processes shape age/sex structure; other demographic characteristics of older people.

GER 780. Medical Sociology. 3 Hours.
Theory and research in medical sociology; systematic overview of relevant literature.

GER 781. Sociology of Health. 3 Hours.
Subjective experience of illness; predictions of health behavior; social networks and health.

GER 785. Psychology of Aging. 3 Hours.
Age differences in perception, memory, intelligence, personality, adjustment, and psychopathology.

GER 786. Aging Seminar. 1 Hour.
Contemporary topics in aging, including basic science, clinical, and psyco-social issues.

GER 788. Social Medicine. 3 Hours.
Socioenvironmental factors in etiology of disease; social movements and health policy; medical ethics and broad ethical issues; place of social science in medical care.

GER 789. Social Medicine Seminar. 3 Hours.

GER 790. Independent Study in Gerontological Nursing. 1-3 Hour.

GER 791. Seminar in Gerontological Substantive Areas. 3 Hours.
Seminar in Gerontological Substantive Areas.

GER 796. Research Seminar in Health and Aging. 3 Hours.

Medical Scientist Training Program

Degree Offered:	M.D.-Ph.D.
Co-Director:	William Geisler, M.D., MPH.
Co-Director:	Talene Yacoubian, M.D., Ph.D
Director Title:	Co-Directors of Medical Scientist Training Program
Phone:	(205) 934-4092 or 934-0676
E-mail:	mstp@uab.edu
Website:	http://www.mstp.uab.edu

Overview

UAB's outstanding research and clinical training programs provide a unique opportunity for students interested in careers in basic biomedical research. As a designated NIH Medical Scientist (M.D.-Ph.D.) Training Program (MSTP), students are admitted concurrently to the School of Medicine and the Graduate School in order to pursue both the M.D. degree and the Ph.D. degree. Ph.D. study in this program is available in the areas of biochemistry, structural, and stem cell biology; biomedical engineering; biostatistics; cancer biology; cell, molecular and developmental biology; epidemiology; genomics, and bioinformatics; health behavior; immunology; microbiology, neuroscience; nutrition sciences; pathobiology and molecular medicine; public health; sociology; and vision science.

Individuals admitted to this highly competitive program must have excellent undergraduate academic records and MCAT scores. In addition, successful applicants must have demonstrated their commitment to a

career pathway as an investigator with active participation in an original research project prior to admission. Fellowship support, including a stipend and payment of tuition and fees, is provided to successful applicants.

In general, M.D.-Ph.D. students will first complete the basic science phase of the medical curriculum and the first-year core curriculum of their chosen Ph.D. discipline simultaneously. The second phase of study will focus on mentor selection, research path, and completion of a dissertation research project leading to the Ph.D. degree. The final phase of the program is a series of clinical rotations and an abbreviated set of acting internships to complete the M.D. degree. Normally, the program involves about 8 years for completion, depending on the time required to complete the dissertation research.

Interested applicants must complete the standard AMCAS application to the UAB School of Medicine and a short secondary application to the M.D.-Ph.D. program once the AMCAS application has been reviewed for consideration. More information is available at https://www.uab.edu/medicine/mstp/admissions

Students who have initiated study in the University of Alabama School of Medicine or the UAB Graduate School may also apply to the MD-PhD Program. Please contact the MSTP Directors for further information.

Biochemistry & Structural Biology (BSB) Theme - MSTP/ARISE

Requirements		Hours
Module Courses [1]		**8**
Theme Required Course		**6**
GBSC 742	GBS Student Theme Meeting Course [2]	
GBS Required Courses		**23**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [3]		
Biostatistics [4]		
Journal Clubs [5]		
Three Advanced Courses [6]		
MSTP/ARISE Required Courses		**39**
MSTP 794	Translational Research Seminar [7]	
MSTP 795	Continuing Clinical Education [8]	
Research [9]		
Total Hours		**76**

1. Four modular courses selected from the following: GBS 710, GBS 712, GBS 714, GBS 720, GBS 724, GBS 740A, GBS 740B, GBS 741, GBS 744, GBS 750, GBS 751, GBS 752, GBS 753, GBS 760, GBS 762, GBS 763, GBS 764, GBS 769, GBS 770, GBS 774, GBS 781, GBS 782, GBS 784, GBSC 718, GBSC 727, GBSC 729, GBSC 744, GBSC 747
2. Required each fall and spring semester
3. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course
4. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course
5. Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
6. Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.
7. Required every semester
8. Required each fall and spring semester
9. Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Cancer Biology (CANB) Theme - MSTP/ARISE

Requirements		Hours
Module Courses		**8**
GBS 710	Cell Signaling	
GBS 769	Carcinogenesis	
GBS 770	Pathobiology of Cancer	
GBS 774	Cancer Immunology	
Theme Required Courses		**6**
GBS 777	Cancer Biology Seminar [1]	
GBS Required Courses		**23**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [2]		
Biostatistics [3]		
Journal Clubs [4]		
Three Advanced Courses [5]		
MSTP/ARISE Required Courses		**39**
MSTP 794	Translational Research Seminar [6]	
MSTP 795	Continuing Clinical Education [7]	
Research [8]		
Total Hours		**76**

1. Required each fall and spring semester.
2. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course.
3. Course selected from GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course.
4. Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
5. Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726 GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709,GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.

6 Required every semester.

7 Required each fall and spring semester.

8 Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Cell, Molecular & Developmental Biology (CMDB) Theme - MSTP/ARISE

Requirements		Hours
Module Courses [1]		**8**
Theme Required Courses		**7**
GBS 717	Methods and Scientific Logic	
GBS 792	CMDB Seminar [2]	
GBS Required Courses		**23**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [3]		
Biostatistics [4]		
Journal Clubs [5]		
Three Advanced Courses [6]		
MSTP/ARISE Required Courses		**39**
MSTP 794	Translational Research Seminar [7]	
MSTP 795	Continuing Clinical Education [8]	
Research [9]		
Total Hours		**77**

1 Four modular courses selected from the following: GBS 710, GBS 712, GBS 714, GBS 720, GBS 724, GBS 740A, GBS 740B, GBS 741, GBS 744, GBS 750, GBS 751, GBS 752, GBS 753, GBS 760, GBS 762, GBS 763, GBS 764, GBS 769, GBS 770, GBS 774, GBS 781, GBS 782, GBS 784, GBSC 718, GBSC 727, GBSC 729, GBSC 744, GBSC 747

2 Required each fall and spring semester.

3 Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course

4 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course.

5 Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793

6 Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.

7 Required each semester

8 Required each fall and spring semester

9 Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Genetics, Genomics and Bioinformatics (GGB) Theme - MSTP/ARISE

Requirements		Hours
Module Courses [1]		**8**
Theme Required Courses		**7**
GBS 717	Methods and Scientific Logic	
GBSC 742	GBS Student Theme Meeting Course [2]	
GBS Required Courses		**23**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [3]		
Biostatistics [4]		
Journal Clubs [5]		
Three Advanced Courses [6]		
MSTP/ARISE Required Courses		**39**
MSTP 794	Translational Research Seminar [7]	
MSTP 795	Continuing Clinical Education [8]	
Research [9]		
Total Hours		**77**

1 Four modular courses selected from the following: GBS 710, GBS 712, GBS 714, GBS 720, GBS 724, GBS 740A, GBS 740B, GBS 741, GBS 744, GBS 750, GBS 751, GBS 752, GBS 753, GBS 760, GBS 762, GBS 763, GBS 764, GBS 769, GBS 770, GBS 774, GBS 781, GBS 782, GBS 784, GBSC 718, GBSC 727, GBSC 729, GBSC 744, GBSC 747

2 Required each fall and spring semester

3 Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course

4 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course.

5 Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793

6 Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.

7 Required each semester

8 Required each fall and spring semester

9 Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Immunology (IMM) Theme - MSTP/ARISE

Requirements		Hours
Module Courses		**8**
GBS 740A	Introduction to Immunology Part 1	
GBS 740B	Introduction to Immunology Part 2	
GBS 744	Mucosal Immunology	
GBS 741	Lymphocyte Biology	

Theme Required Courses		**6**
GBSC 742	GBS Student Theme Meeting Course [1]	
GBS Required Courses		**23**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [2]		
Biostatistics [3]		
Journal Clubs [4]		
Three Advanced Courses [5]		
MSTP/ARISE Required Courses		**39**
MSTP 794	Translational Research Seminar [6]	
MSTP 795	Continuing Clinical Education [7]	
Research [8]		
Total Hours		**76**

1. Required each fall and spring semester
2. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course
3. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course
4. Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
5. Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course.
6. Required every semester
7. Required each fall and spring semester
8. Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Microbiology (MIC) Theme - MSTP/ARISE

Requirements		Hours
Module Courses		**8**
GBS 760	Bacterial Genetics and Physiology	
GBS 762	Virology	
GBS 764	Introduction to Structural Biology Methods	
GBS 763	Microbial Pathogenesis	
Theme Required Courses		**8**
GBS 768	Communicating Science: Reading, Writing and Presentation	
GBSC 742	GBS Student Theme Meeting Course [1]	
GBS Required Courses		**23**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [2]		
Biostatistics [3]		
Journal Clubs [4]		
Advanced Courses [5]		
MSTP/ARISE Required Courses		**39**
MSTP 794	Translational Research Seminar [6]	
MSTP 795	Continuing Clinical Education [7]	
Research [8]		
Total Hours		**78**

1. Required each fall and spring semester
2. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBS 768, GBSC 726, GRD 709, or other approved course
3. Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course
4. Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793
5. Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course
6. Required every semester
7. Required each fall and spring semester
8. Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Neuroscience (NEURO) Theme - MSTP/ARISE

Requirements		Hours
Module Courses		**8**
GBSC 744	Neuroanatomy	
GBSC 729	Cell Neurophysiology	
GBS 714	Developmental Neuroscience	
GBSC 727	Neuro Systems	
Theme Required Courses		**9**
GBS 737	Neuro Student Summer Seminar Series [1]	
NBL 703	Nuerobiology Seminar Series [2]	
GBS Required Course		**23**
GRD 717	Principles of Scientific Integrity	
Grant-Writing/Scientific Communication [3]		
Biostatistics [4]		
Journal Clubs [5]		
Three Advanced Courses [6]		
MSTP/ARISE Required Course		**39**
MSTP 794	Translational Research Seminar [7]	
MSTP 795	Continuing Clinical Education [8]	
Research Hours [9]		
Total Hours		**79**

1. Required each summer semester
2. Required each fall and spring semester
3. Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course

4 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course

5 Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793

6 Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course

7 Required every semester

8 Required each fall and spring semester

9 Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Pathobiology, Pharmacology, & Physiology (P [3]) Theme - MSTP/ARISE

Requirements		Hours
Module Courses		**8**
GBS 750	Intro to Physiology	
GBS 751	Intro to Physiology II	
GBS 752	Intro to Pathobiology	
GBS 753	Intro to Pharmacology & Toxicology	
Theme Required Courses		**6**
GBSC 742	GBS Student Theme Meeting Course [1]	
GBS Required Courses		**23**
GRD 717	Principles of Scientific Integrity	
Grant Writing/Scientific Writing [2]		
Biostatistics [3]		
Journal Clubs [4]		
Advanced Courses [5]		
MSTP/Arise Required Courses		**39**
MSTP 794	Translational Research Seminar [6]	
MSTP 795	Continuing Clinical Education [7]	
Research [8]		
Total Hours		**76**

1 Required each fall and spring semester

2 Course selected from the following: PSDO 700, GBS 716, GBS 725, GBSC 726, GRD 709, or other approved course

3 Course selected from the following: GRD 770, BST 611, BST 612, BY 755, PY 716, or other approved course

4 Required each fall and spring semester. Courses selected from the following: GBS 736, GBS 746J, GBS 756, GBS 776, GBS 786J, GBS 793, GBSC 700, GBSC 713, GBSC 720, INFO 673, INFO 793

5 Three advanced courses selected from the following: GBS 700, GBS 702, GBS 715, GBS 718, GBS 726, GBS 727, GBS 729, GBS 739, GBS 742, GBS 749, GBS 754, GBS 757, GBS 758, GBS 765, GBS 775, GBS 778, GBS 779, GBS 783, GBSC 705, GBSC 706, GBSC 707, GBSC 709, GBSC 710, GBSC 712, GBSC 714, GBSC 715, GBSC 717, GBSC 721, GBSC 724, GBSC 725, GBSC 728, GBSC 730, GBSC 732, GBSC 734, GBSC 735, GBSC 736, GBSC 740, GBSC 741, GBSC 743, GBSC 745, GBSC 746, GBSC 748, INFO 701, INFO 702, INFO 703, INFO 704, INFO 751, INFO 762, INFO 796, INFO 797, BME 723, BME 770, BME 772, BME 780, or other approved course

6 Required every semester

7 Required each fall and spring semester

8 Student must complete 24 hours total of dissertation research, MSTP 799 or PSDO 799.

Courses

MSTP 793. Basic Research Forum. 1 Hour.
This course is for entering MD-PHD students to meet the GBS Core-Course requirements. The following list consists of desirable competencies for enrolled MD-PHD students to achieve while in this course: (a) Learn fundamental topics in biomedical research that will not be covered in SOM courses; (b) Fill gaps in curriculum between GBS707/709; and (c) Introduce topics that may be of interest for future lab rotations.

MSTP 794. Translational Research Seminar. 1 Hour.
The CAMS Translational Research Seminar series, required fall, spring and summer semesters, invites UAB faculty (PhD, MD, MD-PhD or MPH) who are conducting translational research to present their work to students in the MSTP. The goal of the presentation is three fold: (a) to inform students about the career path of the investigator, (b) to provide them with information regarding the initiation and conduct of translational research, and (c) to expose students to current developments in basic and clinical research. There are two to three sessions each year in which panels or round tables discuss topics, including mentor selection, preparation for residency, residency selection, and the overall UAB MSTP experience. Lecturers give a 45-minute presentation followed by a 15-minute question and answer session. This course is open only to MD-PhD students.

MSTP 795. Continuing Clinical Education. 1 Hour.
This course is designed to maintain clinical skills and knowledge during students' dissertation research years. MSTP students will take the course every fall semester and spring semester during their PhD dissertation phase. Each semester, students will be required to complete seven course components. Some components serve to maintain clinical skills and includes students conducting a resident-supervised clinical encounter as well as completing one half day of shadowing. Other components serve to maintain or bolster clinical knowledge and include students attending case conferences and/or participating in simulation sessions. This course is open only to MD-PhD students.

MSTP 796. Anatomy Lab TA Opportunity. 1 Hour.
From 23 TOTAL dissections between the MS1 and MS2 years, students choose any 6 dissections to teach depending on their availability. Overview: MS4 students will serve as Anatomy Teaching Associates for MS1 and MS2 students during scheduled lab times to make preclinical training more robust and clinically relevant. Course benefits for MS4 students: - Small-group anatomy training aimed to improve knowledge of anatomy & dissection skills. - Teaching & mentoring experience of students with less clinical experience. - Flexible schedule: Preferred dissections may be changed up to 1 week before the preclinical scheduled lab time. Format: - Students will attend a 1-hour orientation session addressing effective teaching techniques in August of the entering year (accommodation for absence can be made on a case-by-case basis). - The week prior to their chosen dissections, students will receive 2 hours of small group training in SOM lab under the directions of trained UAB Anatomist and Course Director Dr. Resuehr. During this training, students will perform the relevant cadaveric dissection which will be saved for demonstration during the preclinical lab. -TAs will be assigned to a group of preclinical students during their scheduled lab time to help answer questions. Particular emphasis will be placed on providing preclinical students with clinical correlates. Learning Objectives: - Dissect and identify all associated structures of their chosen dissections emphasizing the relation of structures to each other and common pathologies. - Understand common anatomical variations (if applicable). - Understand anatomically relevant information pertaining to clinical procedures. - Understand geriatric changes. - Mentor and teach students with less experience.

MSTP 798. MSTP Non-Dissertation Hours. 1-8 Hour.
Laboratory research pre-qualification. Only open to MSTP students.

MSTP 799. MSTP Dissertation Hours. 1-8 Hour.
Dissertation research. Only open to MSTP students.
Prerequisites: GAC Z

Coordinated M.D./M.S. of Global Health

The Master of Science in Global Health is a joint degree with the Heersink School of Medicine and the School of Public Health. There are two program pathways available for this degree, including a Thesis and a Non-Thesis option. For additional information about this degree, please visit this informational page: School of Public Health / Heersink School of Medicine Global Health.

Master of Science in Global Health

Thesis Option

Requirements		Hours
GHM 601	Global Health Foundations I	3
GHM 602	Global Health Foundations II	3
GHS 600	Fundamentals of Global Health	3
PUH 600	Overview of Public Health	3
IDGH 620	Global Health Ethics	3
IDGH 690	Writing for Global Health	5
GHM 604	Global Health Research Methods [1]	3
IDGH 699	Master's Directed Research	6
Global Health Electives		9
Total Hours		**38**

Non-Thesis Option

Requirements		Hours
GHM 601	Global Health Foundations I	3
GHM 602	Global Health Foundations II	3
GHS 600	Fundamentals of Global Health	3
PUH 600	Overview of Public Health	3
IDGH 620	Global Health Ethics	3
IDGH 690	Writing for Global Health	5
GHM 604	Global Health Research Methods [1]	3
IDGH 687	Global Health Scholarly Prep	3
IDGH 688	Scholarly Project Directed Research	4
Global Health Electives		6
Total Hours		**36**

[1] Other approved methods courses include: HCO 628, EPI 610, BST 621, BST 626, BST 611, HCO 609, HCO 631

School of Nursing

Degree Offered:	M.S.N.
Assistant Dean (M.S.N.):	Dr. Tedra Smith
Phone:	(205) 996-4193
Email:	tedraka@uab.edu
Director (A.M.N.P.)	Dr. Michael Mosley
Phone	(205) 975-3465
Email	mmosley@uab.edu

Degree Offered:	D.N.P.
Assistant Dean (D.N.P.):	Dr. Curry Bordelon
Phone:	(205) 934-0479
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Director (Nurse Anesthesia):	Dr. Susan P McMullan
Phone:	(205) 934-6587
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Degree Offered	Ph.D.
Director (Ph.D.):	Dr. Edwin Aroke
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Degree Offered:	M.S.N.
Director (A.M.N.P.):	Dr. Michael Mosley
Phone:	(205) 975-3465
E-mail:	mmosley@uab.edu

A.M.N.P. Program Description

The Accelerated Master's Entry to Nursing Pathway (AMNP**)** is an alternate pathway into the existing master's in nursing (MSN degree) for applicants who have a bachelor's degree in a field other than nursing, who are not registered nurses, and who seek MSN preparation. Students may apply for continued graduate options while in the AMNP coursework to start after successful completion of the AMNP. The AMNP was developed in response to the growing need for well-educated, highly skilled professionals who can manage complexity within clinical environments.

A.M.N.P. Admission Requirements

Admission is based on the applicant's academic record and all application materials at the time of the application deadline. *All grades (UAB and other colleges/universities) from previous college course work must be posted on applicant's UAB transcript by the application deadline. Courses *in progress* must be validated with a letter from the college or university students are attending. Accelerated Masters in Nursing Pathway (AMNP) - School of Nursing | UAB.

- Applicants must have earned a minimum of a baccalaureate degree from a regionally accredited college/university prior to beginning classes. Applications are completed through the School of Nursing at: http://www.uab.edu/nursing/home/apply-now.
- Upon receipt of ALL official transcripts, course work will be evaluated for advisement purposes regarding AMNP Foundational Courses.
- Pre-requisites: Students are eligible to apply if they will have successfully completed a minimum of 29 semester credit hours by the Application Deadline of the AMNP Pre-requisite Foundation Coursework (listed on the next page). The final minimum cumulative/overall and Pre-requisite Foundation Coursework GPA must be a 3.0 or greater. Once you have applied through UAB Graduate School, and upon receipt of ALL official transcripts, your coursework will be evaluated for advisement purposes. Completion of AMNP foundation/pre-requisite courses with at least a 3.0 GPA and a "C" or better in each course: Human Anatomy, Human Physiology, Microbiology, Chemistry I with lab, Chemistry II with lab or core science (excluding Geology or Astronomy), Developmental Psychology, Descriptive Statistics, Core Mathematics such as Pre-Calculus or Finite Mathematics, and Nutrition. Accelerated Masters in Nursing Pathway (AMNP) - School of Nursing | UAB
- GPA: The minimum cumulative AND foundational GPA for all AMNP applicants is 3.0 at the time of application. Admission is competitive and is based on space availability. A minimum cumulative GPA of 3.0 does not guarantee admission to the School of Nursing. It is strongly recommended that applicants to the School of Nursing demonstrate a record of full-time study; a minimum number of course repeats/grade forgiveness options, and withdrawals.
- A minimum score of 410 on the MAT; or a minimum score of 480 on the GMAT; or a combined score of 297 on the verbal and quantitative sections of the Graduate Record Examination (GRE).Students who have a 3.2 GPA or better may waive this requirement.
- Test Waiver: The GRE/GMAT/MAT Waiver process allows eligible candidates for master's study to have this requirement waived if they meet the following criteria: Have earned a baccalaureate degree from a regionally accredited university and have a cumulative GPA of 3.2 on a 4.0 scale. Approval for the waiver does not imply or guarantee admission to the AMNP. The following individuals are not eligible for the waiver process: International applicant and Non-native English speaking applicants. Candidates not eligible for the Waiver Process will be required to take the GRE/GMAT/MAT and submit an official score by the application deadline. Upon receipt of the applicant's transcripts, the Office of Student Affairs at the SON will verify with the student that they do not need to take one of the following: GRE/GMAT/MAT.
- International students must achieve a TOEFL examination score of at least 500;
- Three (3) letters of professional reference attesting to the applicant's potential for graduate study.
- A resume, outlining health care interest/experience, campus/community involvement, leadership, and employment will be due by the application deadline. Resumes should not be more than one page in length. Applicants are strongly encouraged to provide proof of work/volunteer experience in a healthcare setting as part of the application process. The healthcare work is to be documented by letters from a supervisor (on agency letterhead). Completion of a nursing skills course does not meet these criteria.
- Interviews: Due to the competitive nature, not all candidates that apply will be invited for interviews. Applicants will be notified if they are invited to participate in the interview round for continued consideration for admission. Interviews will be conducted in either October or November. You will be given ample time to plan for a trip to campus if you are selected to be interviewed. Students will be notified shortly after the interviews of our admission decision.

A.M.N.P. Degree Requirements

AMNP provides pre-licensure coursework leading to a Master of Science in Nursing, MSN, degree. Students should be prepared to dedicate 40 hours or more a week to coursework and clinicals. Students find that it is not feasible for them to work while completing coursework and clinicals. AMNP is live and not distance accessible.

The pre-licensure:

58 Credits, 840 contact hours. Consists of 12 months of full-time study in which students complete the required courses and clinical experiences and are eligible to apply for licensure as a registered nurse. Students emerge with the knowledge and skills required to function as a registered nurse through an intense learning experience. Upon successful completion of pre-licensure requirements, the UAB University Registrar sends a certified letter to the Alabama Board of Nursing stating that students have successfully completed requirements and are eligible to take the National Certification Licensure Exam for RNs (NCLEX-RN). Students who successfully complete the NCLEX-RN may apply for licensure and for employment as a Registered Nurse.

The Master of Science in Nursing:

The MSN degree provides an entry-level focus in healthcare technology and transitional care while allowing for further graduate nursing education into multiple pathways of graduate nursing studies

A.M.N.P. Program Goals

The MSN program of study is designed to prepare nurses who: synthesize research, theoretical formulations, and principles of scientific inquiry to provide evidence-based practice; assume leadership in managing and evaluating continuous quality improvement processes; use information systems/technology to evaluate programs of care, outcomes of care and care systems; advocate and implement health care policies that improve access, equity, efficiency, and social justice in the delivery of health care; design innovative educational programs for patients, nursing staff, and nursing students using teaching and learning principles; provide ethical, culturally sensitive care in an advanced nursing role independently and collaboratively with professionals from multiple disciplines; monitor the quality of one's own nursing practice based on professional practice standards and relevant statutes and regulations; and apply theories and principles of marketing, economics, consultation, management, and leadership to comprehensively perform an advanced nursing role.

Degree Offered:	M.S.N.
Director (M.S.N.):	Dr. Tedra Smith
Phone:	(205) 996-4193
E-mail:	tedraka@uab.edu

Master of Science in Nursing

Program Description

The Master of Science in Nursing (MSN) curriculum prepares nurses for advanced nursing practice and generalist practice. MSN graduates are prepared to practice in a variety of roles in a health care system requiring advanced knowledge of patient/client care delivery and a high level of critical thinking. In addition, MSN graduates have a foundation for future doctoral study in nursing.

- Preparation as a nurse practitioner in family; adult/gerontology; pediatric primary, dual (primary and acute) pediatric care; neonatal acute and continuing care; women's health, or psychiatric-mental health
- Preparation in the rapidly evolving area of nursing and health systems management
- Preparation as a clinical nurse leader

Students may also select: the Registered Nurse First Assist (RNFA), forensics, palliative care, oncology, emergency care, and education subspecialty course work are also available.

***PROGRAM SCHEDULING*:** Students admitted to a master's study in the summer and fall terms in most specialty tracks. Students will follow a part-time program of study. Students follow prescribed courses; however, individual needs are considered. All core courses and selected specialty courses are available via distance education. Additionally, please refer to the UAB online website to ensure we are approved in your state https://www.uab.edu/elearning/students/state-authorization

CLINICAL SCHEDULE: Clinical experiences for the MSN student are coordinated with your faculty. The student contracts to work with a clinical preceptor who is a certified registered nurse practitioner, a registered nurse, or a physician. The total number of clinical hours required varies depending on the specialty. Students must have a current RN license in the state where they do their clinical practice prior to enrolling in the advanced practice courses.

NURSE PRACTITIONER ACUTE AND CONTINUING CARE

Acute and continuing care nursing at UAB School of Nursing is a holistic approach to health care that focuses on the needs and strengths of the acutely or critically ill adult, neonate, or pediatric client. Further concentration in cardiovascular, neuroscience, or oncology may be available to those who select the adult acute care nurse practitioner option.

NURSE PRACTITIONER PRIMARY CARE

Primary care nursing is a holistic approach to health care that focuses on the needs and strengths of the whole person within families and communities; health promotion; disease prevention, and the identification and management and/or referral of health problems. Students with an interest in primary care may select advanced study in adult, family, pediatric, or women's health nursing. Secondary specialization in occupational health is available in conjunction with a primary care nurse practitioner track.

OTHER OPTIONS

Other options in the graduate program include an, a post-baccalaureate certificates preparing students to teach in nursing; a post-master's program of study to prepare nurse practitioners, a RN-BSN and a RN-MSN track which incorporates course work at the master's level and a BSN-PhD option. For more information on all options, please visit https://www.uab.edu/nursing/home/academics/masters

NURSING AND HEALTH SYSTEMS MANAGEMENT

Nurses enrolled in this option may elect to study Nursing and Health Systems Administration or Nursing Informatics. Informatics is one of the fastest growing areas in health care. Informatics may be defined as a combination of computer science, information science and nursing designed to assist in the management and processing of nursing data,

information, and knowledge designed to support the practice of nursing and delivery of nursing care. The focus of nursing informatics practice is the organization, analysis, and dissemination of information.

CLINICAL NURSE LEADER

The Clinical Nurse Leader (CNL) is a leader in the health care delivery system. The CNL assumes accountability for patient care outcomes through the application of research-based information to design, implement, and evaluate patient plans of care. The CNL is a provider and manager of care at the point of care to patients and cohorts of patients within a healthcare setting. The role includes the design, implementation, and evaluation of patient care outcomes by coordinating, delegating, and supervising the care provided by the health care team, including licensed nurses, technicians, and other health professionals.

Non-Degree Options at the MSN Level

The Post-Master of Science in Nursing (MSN) certificate track curriculum prepares nurses for advanced nursing practice as a nurse practitioner. This option is available for nurses who hold or are eligible for an advanced practice certification. MSN graduates who wish to take a designated program of study in preparation for sitting for one of the nurse practitioner certification examinations may apply for non-degree graduate status. Applicants for the Post MSN NP Option are considered on an individual basis, depending on NP practice experience and previous coursework. Applicants that are determined to be ineligible for the Post MSN NP Option will be encouraged to apply for a second MSN degree. Post-master's non-degree students will be not awarded a degree, not be eligible to participate in commencement activities, and may not qualify for financial aid or scholarships. Students that successfully complete the course work will receive documentation confirming that the course work meets the requirements to be eligible to take the advanced certification exam.Post-Graduate APRN Certificate - School of Nursing | UAB

The non-degree graduate student classification also makes selected master's-level nursing courses available to persons who have a bachelor's degree in nursing from a regionally accredited institution.

Students interested in the non-degree graduate student classification and the non-degree options below will need to contact UAB School of Nursing Office for Student Success at 205-975-7529 for application instructions.

The UAB School of Nursing offers several subspecialty areas of coursework that may be completed as part of the MSN degree or as a non-degree Post-MSN option by practicing nurse practitioners who have already completed the MSN degree. Current sub-specialty options can be viewed at Subspecialty Options - School of Nursing | UAB

In addition to the non-degree graduate student classification to take selected courses, there are two non-degree options for post-BSN students in Teaching and Registered Nurse First Assist (RNFA)

Teaching *Certificate for Post BSN Applicants*-Additionally, applicants at the post-baccalaureate level may choose to seek certification to prepare for the faculty role.

Registered Nurse First Assist (RNFA) *Certificate for Post-Baccalaureate Applicants*- A Registered Nurse First Assistant (RNFA) is prepared to practice in a variety of acute or critical care settings. The RNFA, in collaboration with the surgeon, provides continuous and comprehensive patient care throughout the perioperative period.

M.S.N. Program Goals

The MSN program of study is designed to prepare nurses who: synthesize research, theoretical formulations, and principles of scientific inquiry to provide evidence-based practice; assume leadership in managing and evaluating continuous quality improvement processes; use information systems/technology to evaluate programs of care, outcomes of care and care systems; advocate and implement health care policies that improve access, equity, efficiency, and social justice in the delivery of health care; design innovative educational programs for patients, nursing staff, and nursing students using teaching and learning principles; provide ethical, culturally sensitive care in an advanced nursing role independently and collaboratively with professionals from multiple disciplines; monitor the quality of one's own nursing practice based on professional practice standards and relevant statutes and regulations; and apply theories and principles of marketing, economics, consultation, management, and leadership to comprehensively perform an advanced nursing role.

M.S.N. Admission Requirements

To apply to the MSN program please visit: https://www.uab.edu/nursing/home/apply-now

For more information please visit please contact UAB School of Nursing Office for Student Success at 205-975-7529 or go to https://www.uab.edu/nursing/home/msn-specialty-tracks for more information on specialty and subspecialty course options.

Requirements for admission for the MSN degree include the following:

- BSN degree from a regionally accredited institution, equivalent to the one offered by the School of Nursing, UAB;
- Cumulative grade point average of at least 3.0 on a 4.0 scale or on the last 60 semester hours; (Graduates of baccalaureate degree programs in countries other than the United States must have their baccalaureate degree transcripts evaluated by the Educational Credential Evaluators, Inc. OR The World Education Services Organization);
- Combined score of 297 on verbal and quantitative sections of the GRE; or score of 410 on the MAT; or score of 480 on the GMAT; Test scores submitted to UAB from the GRE, GMAT, or MAT must not be over 5 years old. Applicants with a 3.2 GPA or better may waive the Test Score requirement if they meet the criteria, please see: **GRE/GMAT/MAT Waiver Process for degree seeking MSN students**;
- International students must achieve a TOEFL examination score of at least 550; and
- Three (3) letters of professional reference attesting to the applicant's potential for graduate study.
- **All prospective students that desire to apply to UAB SON must do so through the application link at: http://www.uab.edu/nursing/home/apply-now**

*For **non-nursing** bachelor's prepared students, an alternate master's in nursing option is available: https://www.uab.edu/nursing/home/academics/masters/amnp

****The following individuals are not eligible for the GRE waiver process:**

• International applicants• Non-Native English speaking applicants• Dual degree seeking program applicants MSN/MPH

For International Students:

- This program is distance-accessible and therefore ***not*** eligible for applicants entering the US in F-1 or J-1 student status
- If you plan to enroll with an immigration status other than F or J, please email UAB International Admissions at IntlAdmin@uab.edu for confirmation of your eligibility for the program
- All foreign transcripts evaluated by the Educational Credential Evaluators, Inc www.ece.org OR the World Education Services www.wes.org, sent from the evaluators directly to the School of Nursing with a course by course evaluation
- A degree equivalent to a bachelor's degree from a regionally accredited educational college/university in the United States
- A score of 500 or higher on the Test of English as a Foreign Language, TOEFL
- Standardized test score. A minimum combined score of 297 on the verbal and quantitative sections of the Graduate Record Examination (GRE).
- Possess an unencumbered and unrestricted nursing license to practice nursing in the state where you plan to conduct your clinical practicum

Master of Science in Nursing-Nurse Practitioner Core & Foundation Courses

Requirements		Hours
NUR 737	Interprofessional Leadership and Role Development for Practice Excellence (or NUR 604)	3
NUR 612	Advanced Pathophysiology	3
NUR 735	Population Health in Advanced Practice Nursing	3
NUR 729	Evidence-Based Practice Design and Translation	3
NUR 613	Pharmacology and Therapeutics	3
NUR 614	Assessment and Diagnostic Reasoning for Advanced Nursing Practice	3
Total Hours		**18**

Adult-Gerontology Primary Care Nurse Practitioner

Requirements		Hours
NAH 618L	Focus on Advanced Nursing Practice Specialization	3
NAH 621	Advanced Adult Gerontology Nursing I - Primary Care	5
NAH 685L	Practicum I: Adult/Gerontology Nurse Pracitioner	3
NAH 622	Advanced Adult Gerontology Nursing II - Primary Care	4
NAH 686L	Practicum II: Adult/Gerontology Nurse Practitioner - Primary Care	3
NAH 623	Advanced Adult Gerontology Nursing III - Primary Care	5
NAH 692L	Practicum III: Adult/Gerontology Nurse Practitioner - Primary Care	4
Total Hours		**27**

Pediatric Acute Care Nurse Practitioner

Requirements		Hours
NCC 622	Advanced Pediatric Nursing II - Acute Care	3
NCC 618L	Focus on Advanced Nursing Practice Specialization	3
NCC 621	Advanced Pediatric Nursing I - Acute Care	5
NDP 625	Advanced Dual Option Pediatric Nurse Practitioner	2
NCC 685L	Clinical Practicum I: Advanced Pediatric Nursing - Acute Care	3
NCC 686L	Clinical Practicum II: Advanced Pediatric Nursing - Acute Care	3
NCC 692L	Clinical Practicum III: Advanced Pediatric Nurse Practitioner - Acute Care	4
Total Hours		**23**

Pediatrics Primary Care Nurse Practitioner

Requirements		Hours
NPE 618L		2
NPE 618L	Focus on Advanced Nursing Practice Specialization	
NPE 621	Advanced Pediatric Nursing I - Primary Care	5
NPE 685L	Practicum I: Pediatric Nurse Practitioner –Primary Care	3
NPE 622	Advanced Pediatric Nursing II - Primary Care	4
NPE 686L	Practicum II: Pediatric Nurse Practitioner –Primary Care	3
NPE 623	Advanced Pediatric Nursing III - Primary Care	5
NPE 692L	Practicum III: Pediatric Nurse Practitioner –Primary Care	4
Total Hours		**26**

Dual Pediatric Acute and Primary Care Nurse Practitioner

Requirements		Hours
NDP 618L	Focus on Advanced Nursing Practice Specialization	3
NPE 621	Advanced Pediatric Nursing I - Primary Care	5
NCC 621	Advanced Pediatric Nursing I - Acute Care	4
NPE 622	Advanced Pediatric Nursing II - Primary Care	4
NCC 622	Advanced Pediatric Nursing II - Acute Care	3
NPE 685L	Practicum I: Pediatric Nurse Practitioner –Primary Care	3
NPE 686L	Practicum II: Pediatric Nurse Practitioner –Primary Care	3
NCC 685L	Clinical Practicum I: Advanced Pediatric Nursing - Acute Care	3
NCC 686L	Clinical Practicum II: Advanced Pediatric Nursing - Acute Care	3
NPE 623	Advanced Pediatric Nursing III - Primary Care	4-5
NPE 692L	Practicum III: Pediatric Nurse Practitioner –Primary Care	1-6
NCC 623	Advanced Pediatric Nursing III - Acute Care	5
NCC 692L	Clinical Practicum III: Advanced Pediatric Nurse Practitioner - Acute Care	4
Total Hours		**45-51**

Neonatal Nurse Practitioner

Requirements		Hours
NNE 618L	Focus on Advanced Nursing Practice Specialization	3
NNE 621	Advanced Neonatal Nursing I	3-5
NNE 684L	Practicum I: Neonatal Nurse Practitioner	2-3
NNE 622	Advanced Neonatal Nursing II	4-5
NNE 685L	Practicum II: Neonatal Nurse Practioner	2-3
NNE 623	Advanced Neonatal Nursing III	4-5
NNE 692L	Practicum III : Neonatal Nurse Practitioner	1-6
Total Hours		**19-30**

Family Nurse Practitioner

Requirements		Hours
NFH 618L	Focus on Advanced Nursing Practice Specialization	3
NFH 621	Advanced Family Nursing I	3-5
NFH 622	Family Nurse Practitioner II	3-4
NFH 623	Family Nurse Practitioner III	5

NFH 685L	Practicum I: Family Nurse Practitioner	3
NFH 686L	Practicum II: Family Nurse Practitioner	3
NFH 692L	Practicum III: Family Nurse Practitioner	3-6
Total Hours		**23-29**

Adult-Gerontology Acute Care Nurse Practitioner

Requirements		Hours
NCA 618L	Focus on Advanced Nursing Practice Specialization	3
NCA 621	Advanced Adult/Gerontology Nursing I - Acute Care	5
NCA 685L	Practicum I: Adult/Gerontology Nurse Practitioner- Acute Care	3
NCA 622	Adult Gerontology Acute Care Nursing Practice II	4
NCA 686L	Practicum II: Adult/Gerontology Nurse Practitioner-Acute Care	3
NCA 623	Advanced Adult/Gerontology Nursing III -Acute Care	5
NCA 692L	Practicum III: Adult/Gerontology Nurse Practitioner-Acute Care	4
Total Hours		**27**

Adult-Gerontology Acute Care NP with Registered Nurse First Assistant

Requirements		Hours
NCA 618L	Focus on Advanced Nursing Practice Specialization	3
NCA 621	Advanced Adult/Gerontology Nursing I - Acute Care	5
NCA 685L	Practicum I: Adult/Gerontology Nurse Practitioner- Acute Care	3
NCA 622	Adult Gerontology Acute Care Nursing Practice II	4
NCA 686L	Practicum II: Adult/Gerontology Nurse Practitioner-Acute Care	3
NCA 692L	Practicum III: Adult/Gerontology Nurse Practitioner-Acute Care	4
NCA 623	Advanced Adult/Gerontology Nursing III -Acute Care	5
NFA 620	Surgical Techniques	3
NFA 621		5
NFA 621	Advanced Perioperative Nursing I	
NFA 622	Advanced Perioperative Nursing I: Practicum	1-3
Total Hours		**36-38**

Women's Health Care Nurse Practitioner

Requirements		Hours
NWH 618L	Focus on Advanced Nursing Practice Women	3
NWH 631	Advanced Women's Health Nursing I	5
NWH 685L	Practicum I: Women's Health Care Nurse Practitioner	3
NWH 632	Advanced Women's Health Nursing II	4
NWH 686L	Practicum II: Women's Health Care Nurse Practitioner	3
NWH 692L	Practicum III: Women's Health Care Nurse Practitioner	4
Total Hours		**22**

Psychiatric/Mental Health Nurse Practitioner

Requirements		Hours
NPN 618L	Focus on Advanced Nursing Practice Specialization	3
NPN 621	Advanced Psych Mental Health Nursing I	5
NPN 685L	Practicum I: Psychiatric Nurse Practitioner	3
NPN 622	Advanced Psychiatric/ Mental Health Nursing II	5
NPN 686L	Practicum II: Psychiatric/ Mental Health Nurse Practitioner	3
NPN 623	Advanced Psychiatric/ Mental Health Nursing III	4
NPN 692L	Practicum III: Psych Mental Health Nurse Practitioner	4
Total Hours		**27**

MSN Nurse-Midwifery Pathway

Requirements		Hours
NMW 618L	Focus on Advanced Nursing Practice Specialization	3
NMW 620	Nurse Midwifery Management I	3
NMW 621	Nurse Midwifery Management II	5
NMW 622	Nurse Midwifery Management III	5
NMW 623	Nurse Midwifery Management IV	4
NMW 685L	Nurse-Midwifery Practicum I	4
NMW 686L	Nurse-Midwifery Practicum II	4
NMW 692L	Residency Full Scope Midwifery Practice	5
Total Hours		**33**

Nurse Educator

Requirements		Hours
NTC 660	Foundations of Evidence-Based Nursing Education	3
NTC 650	Instructional Strategies For Teaching in Nursing	3
NTC 658	Simulation and Classroom Technologies for Student Learning	2-3
NTC 652	Program and Curriculum Development	3
NTC 654	Evaluation of Instruction in Nursing	3
NTC 683L	Teaching Practicum in Nursing	1-3
Total Hours		**15-18**

Nursing Informatics

Requirements		Hours
NHSL 604	Developing the Advanced Nurse Leader	3
NHSL 606	Evidence-Based Translation and Management	3
NHSL 610	Health Care Systems for Advanced Leaders	3
NHSA 631	Advanced Quality and Patient Safety	3-4
NNI 631	Foundations ofNursing Informatics-Scope of Practice, Models, Standards, and Theories	3
NNI 632	Nursing Informatics Systems Analysis and Design	4
NNI 633	Informatics and Information Technology Review to Advance Care	3
NNI 685L	Nursing Informatics: Practicum I	2
NNI 686L	Nursing Informatics: Practicum II	2
NNI 634	Informatics Project Evaluation/Human Factors Students will also take NNI 636 for 3 credit hours	3
NNI 635	Essentials of Project Management for Nursing Information Specialists	3
Total Hours		**32-33**

Clinical Nurse Leader

Requirements		Hours
NCL 618L	Focus on Advanced Nursing Practice Specialization	2
NCL 620	Systems in Population-based Care I	4
NCL 685L	CNL Practicum I	2
NCL 692L	CNL Capstone Practicum	5
NHSL 604	Developing the Advanced Nurse Leader	3
NHSL 606	Evidence-Based Translation and Management	3

NHSL 610	Health Care Systems for Advanced Leaders	3
NUR 612	Advanced Pathophysiology	3
NUR 613	Pharmacology and Therapeutics	3
NUR 614	Assessment and Diagnostic Reasoning for Advanced Nursing Practice	3
NHSA 616	Nursing Financial Management	4
NHSA 617L	Nursing Financial Management Practicum	2-3
Total Hours		**37-38**

Nursing Health Systems Administration

Requirements		**Hours**
NHSA 616	Nursing Financial Management	4
NHSL 604	Developing the Advanced Nurse Leader	3
NHSL 606	Evidence-Based Translation and Management	3
NHSL 610	Health Care Systems for Advanced Leaders	3
NHSA 617L	Nursing Financial Management Practicum	2
NHSA 618	Human Resource Management	3
NHSA 631	Advanced Quality and Patient Safety	4
NHSA 681L		4
NHSA 681L	Advanced Quality and Patient Safety Practicum	
NHSA 632	Nursing and Health Systems Administration I	4
NHSA 682L	Nursing and Health Systems Administration I Practicum	2
NHSA 633	Nursing and Health Systems Administration II	4
NHSA 683L	Nursing and Health Systems Administration II Practicum	2
Total Hours		**38**

Additional Requirements

Candidates for the MSN degree must complete the following requirements: Completion of all coursework and clinical experiences based on the student's Program of Studies, with an overall GPA of 3.0 or better, and grades of B or better in all required courses in the School of Nursing.

Prospective students should use this checklist to obtain specific admissions requirements on how to apply to Graduate School.

Degree Offered:	D.N.P.
Director (Nurse Anesthesia):	Dr. Susan P. McMullan
Phone:	(205) 934-6587
Email:	susanpmcm@uab.edu
Website:	www.uab.edu/na

Post-BSN to Doctor of Nursing Practice Pathway for Nurse Anesthesia

A Nurse Anesthetist, or Certified Registered Nurse Anesthetist (CRNA), is a licensed advanced practice nurse. After completing extensive didactic and clinical education and training, CRNAs become nationally certified. CRNAs safely administer over 40 million anesthetics to patients each year in the United States. They practice in a variety of settings in the private and public sectors and in the U.S. military, including traditional hospital surgical suites and obstetrical delivery rooms, ambulatory surgery centers, pain clinics, and physicians' and dentist offices.

The Post-BSN to DNP Pathway for Nurse Anesthesia is accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs (COA) with full continued accreditation through May 2031.

The Post-BSN to DNP Pathway for Nurse Anesthesia also received IFNA Accreditation in August 2021 having completed all requirements of the Anesthesia Program Approval Process established by the International Federation of Nurse Anesthetists (Date of next review: July 2026).

Professional Program Admission Requirements

Prospective students must meet the following requirements for admission:

- A minimum of a bachelor’s degree in nursing (BSN) from a regionally accredited institution or the equivalent (e.g., entry-level masters in nursing degree such as the UABSON Accelerated Master's in Nursing Pathway for individuals with a minimum of a bachelor's degree in a non-nursing field).
- Active, unencumbered/unrestricted registered nurse license in the state where you will be completing your coursework (didactic and clinical) is required to apply. *If admitted, a multi-state compact license will be required before matriculation into the Post-BSN to DNP Pathway for Nurse Anesthesia.*
- Both UAB and the School of Nursing must have current authorization to operate in the state.
- An undergraduate grade point average (GPA) of at least 3.0 on a 4.0 scale.
- Post-BSN to DNP Pathway for Nurse Anesthesia applicants must have a minimum grade point average of 3.0 on their science prerequisite courses and a grade of ‘C’ or higher in all other pre-requisite courses. The pre-requisite courses consist of Human Anatomy (3-4 semester credit hours), Physiology (3-4 semester credit hours), Microbiology (3-4 semester credit hours), College Chemistry (3-4 semester credit hours), Descriptive Statistics (3 semester credit hours), and Pre-Calculus or Finite Mathematics or higher (3-4 semester credit hours).
- At least 11 months experience as an RN in a critical care setting by the July application interview, and continued employment in the critical care setting until pathway matriculation the following May. It is recommended that critical care experience fall within the past 4 years.
- Critical care experience - Critical care experience must be obtained in a critical care area within the United States, its territories or a US military hospital outside of the United States. During this experience, the registered professional nurse has developed critical decision making and psychomotor skills, competency in patient assessment, and the ability to use and interpret advanced monitoring techniques.
- A critical care area is defined as one where, on a routine basis, the registered professional nurse manages one or more of the following: invasive hemodynamic monitors (e.g., pulmonary artery, central venous pressure, and arterial catheters), cardiac assist devices, mechanical ventilation, and vasoactive infusions. Examples of critical care units may include but are not limited to: surgical intensive care, cardiothoracic intensive care, coronary intensive care, medical intensive care, pediatric intensive care, and neonatal intensive care. Those who have experiences in other areas may be considered provided they can demonstrate competence with managing unstable patients, invasive monitoring, ventilators, and critical care pharmacology. (COA Standards for Accreditation 2020)
- Three (3) letters of professional reference attesting to the applicant’s potential for graduate study.

- Standardized test score on the Graduate Record Examination (GRE)*. There is no minimum score, however all sections of the GRE must be completed prior to application (verbal reasoning, quantitative reasoning, and analytical writing). Scores completed within the previous 5 years will be accepted and must be submitted to UAB (code 1856). There is no Waiver Process for the Nurse Anesthesia DNP pathway, a GRE exam is required.
- A personal interview with the selection committee.
- If admitted, a non-refundable $2000 deposit will be required to reserve a seat in the pathway

Nurse Anesthesia Curriculum

The Nurse Anesthesia Program begins in the fall semester of each year. It comprises 67 semester hours of didactic instruction and 45 semester hours of clinical practicum and requires 27 months of full-time commitment. Students complete all foundation courses before beginning the clinical practicum, which starts after the first (ten) months of enrollment. The curriculum does not permit enrollment on a part-time basis. The Nurse Anesthesia DNP Pathway has eight components: a central component in Birmingham and seven regional components located in Alabama (Dothan, Florence, Huntsville, Mobile, Montgomery, Tuscaloosa, and Mississippi). The first semester is completely online. Semesters 2, 3, 4 will meet face-to-face in Birmingham. The remaining semesters are an integration of clinical and online didactic education. Regardless of component, students will be required to come to Birmingham for periodic intensive learning and examination. In order to obtain clinical case numbers students are also expected to travel to clinical sites.

Doctor of Nursing Practice-Nurse Anesthesia

Requirements		Hours
NA 720	Anesthesia Pharmacology I	3
NA 733	Informatics for Nurse Anesthetists	3
NUR 740	Health Policy and Politics: Implications in Health Care	3
NA 731	Biochemistry & Physics for Nurse Anesthetists	4
NA 702	Anatomy & Physiology for Nurse Anesthetists	6
NUR 700	Clinical Data Management and Analysis	3
NUR 735	Population Health in Advanced Practice Nursing	3
NA 721	Anesthesia Pharmacology II	3
NA 770	Anesthesia Pathophysiology I	3
NA 740	Anesthesia Principles I	4
NUR 614	Assessment and Diagnostic Reasoning for Advanced Nursing Practice	3
NA 708L	Anesthesia Practicum I	2
NA 718L	Focus on Advanced Nursing Practice Specialization	4
NA 741	Anesthesia Principles II	3
NA 750	Regional Anesthesia	3
NA 771	Anesthesia Pathophysiology II	3
NUR 729	Evidence-Based Practice Design and Translation	3
NA 742	Anesthesia Principles III	3
NA 745	Professional Aspects	4
NA 709L	Anesthesia Practicum II	3
NUR 743	Evidence-Based Practice Strategies	3
NA 710L	Anesthesia Practicum III	5
NUR 742	Program Evaluation and Methods	3
NA 795	Critical Concepts I	3
NA 711L	Anesthesia Specialty Immersion I	5
NA 796	Critical Concepts II	3
NUR 739L	DNP Project Implementation and Evaluation Students will take multiple semesters for 7 hours total	1-4
NA 712L	Anesthesia Specialty Immersion II	5
NUR 738L	DNP Project Development	2-3
NA 797	Critical Concepts III	3
NA 713L	Anesthesia Specialty Immersion III Students will also take NQI 702 for 3 hours	5
Total Hours		**104-108**

Application Procedure

Applicants interested in the Nurse Anesthesia Program at the University of Alabama at Birmingham (UAB) should visit Post-BSN to DNP Nurse Anesthesia - School of Nursing | UAB for application information.

Note: See the summarized fact sheet for experience requirements.

Application Deadlines

Entry Date	Deadline	Notes
Summer	May 1	Deadline for Submission of Application
	June	Scheduling and Notification of Applicant Interview
	July	Interviews _ Decision notification two weeks post interview
	Summer semester of following year	Admitted students matriculate

Funding

The School of Nursing at UAB has excellent scholarship, traineeship, fellowship and loan programs in which many students participate. Please visit "funding" for more information.

Outcomes

- Synthesize scientific evidence for the development of clinical interventions for practice.
- Evaluate policy, healthcare delivery, and organizational systems for current and future health care needs.
- Translate scientific, theoretical, and ethical principles into healthcare for individuals, families, and populations.
- Incorporate knowledge of current and emerging health technologies to improve healthcare delivery and organizational systems.
- Advocate for social justice, equity, and ethical policies in healthcare.
- Demonstrate intra- and inter-professional collaboration to address health disparities and to improve the quality of healthcare across diverse populations and cultures.
- Assume complex leadership roles to advance clinical practice and healthcare delivery at the organizational and systems level and to improve health outcomes of individuals and populations.

Graduates can apply to take the certification examination administered by the NBCRNA. Satisfactory performance on this examination is necessary in order to practice as a certified registered nurse anesthetist.

Information for International Students

NOTE: Prospective International students must first contact UAB International Admissions to determine eligibility to study in the U.S. and/or submit an application for admission to UAB.

UAB International Admissions
Email: IntlAdmin@uab.edu
Phone: (205) 934-4686
Fax: (205) 934-8664

Please check the UAB School of Nursing website for additional eligibility requirements.

Application Requirements

- Prospective students must have a master's degree in nursing equivalent to that offered by the U.S. regionally accredited educational institution.
- This program is distance-accessible and therefore not eligible for applicants who plan to enter the US in F-1 or J-1 student status.
- For Graduate Clinical Programs such as the Masters of Science in Nursing (MSN) Program, prospective students must also be licensed as a registered nurse in the U.S., in the state in which they will reside while completing the program.
- International applicants must, as part of their application, provide a detailed course by course evaluation of their academic transcripts and verification of their academic credentials. Students may use one of the following firms for transcript evaluation; a report of the evaluation must be submitted directly to the UAB School of Nursing prior to admission decisions.
  - Educational Credential Evaluators, Inc.
    P.O. Box 514070
    Milwaukee, WI 53203-3470 USA
    Website: www.ece.org
  - World Education Services
    Bowling Green Station
    P.O. Box 5087
    New York, NY 10274-5087 USA
    Website: www.wes.org
- Applicants must have a minimum grade point average (GPA) of 3.0 on a 4.0 scale on prior college/university course work.
- Applicants must complete and submit their scores from the Graduate Record Examination (GRE) as part of the application process. If the GRE was completed prior to application, only scores completed within the previous 5 years are accepted.
- Completion of a formal admission interview.
- Meet English language requirements. Students must submit scores on Tests of English Language (TOEFL or IELTS) and achieve the following minimum scores:
  - TOEFL iBT 80 and minimum of 18 in each of the 4 test sections, or
  - IELTS 6.5 and minimum of 6.0 in at least 2 of the 4 test sections.

For More Information Contact:

UAB International Admissions
Email: IntlAdmin@uab.edu
Phone: (205) 934-4686
Fax: (205) 934-8664

Degree Offered:	D.N.P.
Director (D.N.P.):	Dr. Curry Bordelon
Phone:	(205) 934-0479
E-mail:	cjborde@uab.edu

Doctor of Nursing Practice

D.N.P. Program Description

The DNP is a practice-focused terminal degree to prepare graduates to practice at the highest level in specialty practice or to assume leadership positions in healthcare. Graduates of the DNP program will focus on providing care to populations and communities with an emphasis on improving quality and access to underserved, diverse populations. The three components of the DNP are an advanced clinical specialty practice, leadership, and practice inquiry. Graduates will employ abilities and skills in these areas to advocate for reasonable, rational, and data-driven health regulations, standards, and evidence-based practices; sustain collaborative and strategic relationships, promote innovative, effective health care programs; and form partnerships with diverse groups to address health disparities. In addition, graduates will be prepared to assume clinical faculty positions to address the critical nursing faculty shortage.

The UAB School of Nursing offers four pathways to the Doctor of Nursing Practice degree- the Post-MSN to DNP Pathway for Advanced Practice Nurses, the Post-MSN to DNP Pathway for Nurse Executives, the Post-BSN to DNP Pathway for Nurse Anesthesia, and the Post-BSN to DNP Pathway for Nurse Practitioners.

For most students, the Post-Master's DNP curriculum will be a minimum of 34 credits, which includes the development of a practice-focused or a leadership-focused project. This Scholarly Project is designed to synthesize scholarship in an advanced practice specialty or an area of healthcare leadership and serves as a capstone program experience. All courses are offered in a distance accessible format and students may develop the scholarly project under the direction of program faculty and on-site mentors. Applications will be accepted twice a year for the summer or fall term, to either a full or a part-time cohort. Students enrolled in the DNP program will be required to come on campus between the first and second year for a two to three-day intensive experience.

D.N.P. Program Goals

The D.N.P. program of study is designed to prepare nurses who: evaluate policy, care delivery, and organizational systems for current and future health care needs; translate scientific, theoretical, and ethical principles into healthcare for individuals, families, and populations; incorporate knowledge of current and emerging health technologies to improve care delivery and organizational systems; advocate for social justice, equity, and ethical policies in healthcare; Demonstrate intra and inter-professional collaboration to address health disparities and to improve health care quality across diverse populations and cultures; assume complex leadership roles to advance clinical practice and healthcare delivery at the organizational and systems level and to improve health outcomes of individuals and populations, and assume complex leadership roles to advance clinical practice and healthcare delivery at the organizational and systems level and to improve health outcomes of individuals and populations.

D.N.P. Admission Requirements

Admission is competitive, based on an assessment of the ability of the applicant to complete the program of studies and on the appropriateness of the requested program of studies to the applicant's stated goals. Because only a limited number of applicants can be accommodated in a given academic year, some well-qualified applicants may not be offered admission. In cases where there are more qualified applicants than slots available, the School of Nursing accepts the most qualified applicants.

DNP Pathways - School of Nursing | UAB

Post-MSN to DNP Pathway for Advanced Practice Nurses

This post-masters pathway is for nurses who have completed the MSN degree in an advanced practice nursing specialty and who are certified or eligible for certification in an advanced practice specialty role inclusive of Nurse Practitioner, Nurse Anesthetist, Nurse Midwife, Clinical Nurse Specialist or a Health Systems Leader in Nursing Health Systems Administration or Nursing Informatics. The Post-MSN to DNP curriculum builds on the MSN curriculum with a core program of study that includes didactic and clinical immersion experiences that prepare students to lead improvements in practice supportive of population health and health system change. The Pathway is offered in a distance-accessible format that combines online didactic coursework with face-to-face clinical practicum experiences. In addition, students are required to attend an annual on-campus DNP intensive, as well as an on-campus orientation.

Post-MSN to DNP Pathway for Nurse Executives

The Nurse Executive Pathway is a practice-focused terminal degree that prepares experienced nurse managers/leaders for executive health system leadership roles including but not limited to the Chief Nursing Officer (CNO) or Chief Nursing Informatics Officer (CNIO) roles. The curriculum builds on a master's level curriculum in nursing or a master's degree in business or health administration. The Pathway is offered in a distance-accessible format that combines online didactic coursework with face-to-face clinical practicum experiences. Students are required to attend an on-campus orientation.

Post-BSN to DNP Pathway for Nurse Practitioners

This pathway is for nurses who have not completed an advanced practice specialty at the MSN level. The pathway curriculum integrates the DNP core curriculum with the curriculum for a variety of nurse practitioner specialties including Family NP, Adult-Gerontology Primary Care NP, Adult-Gerontology Acute Care NP, Psychiatric/Mental Health NP, Pediatric Primary Care NP, Pediatric Acute Care NP, Neonatal NP, and Women's Health Care NP. Upon completion of the curriculum, applicants are prepared to apply to sit for certification as a nurse practitioner in a specific specialty area. The Pathway is offered in a distance accessible format that combines online didactic coursework with face-to-face clinical practicum experiences and on-campus clinical specialty track intensives. In addition, students are required to attend an annual on-campus DNP intensive and an orientation.

Dual DNP-PhD Degree

A dual DNP-PhD degree prepares graduates to lead improvements in practice supportive of population health and health system change, and expand that focus into a related research area to generate new knowledge. The curriculum combines the core content from the two programs to prepare a clinical nurse scholar who desires to merge clinical leadership with scientific inquiry to advance nursing science and improve clinical practice. This pathway is open to MSN-prepared nurses with certification in an advanced practice role.

Post-BSN to DNP Pathway for Nurse Practitioners common courses to all NP concentrations

Requirements		Hours
NUR 737	Interprofessional Leadership and Role Development for Practice Excellence	3
NUR 745	Foundations of Scholarly Writing	3
NUR 735	Population Health in Advanced Practice Nursing	3
NUR 731	Philosophical, Theoretical, and Conceptual Foundations for Advanced Practice Nursing	3
NUR 729	Evidence-Based Practice Design and Translation	3
NUR 740	Health Policy and Politics: Implications in Health Care	3
NUR 733	Informatics for Advanced Practice Nursing	3
NUR 700	Clinical Data Management and Analysis	3
NUR 612	Advanced Pathophysiology	3
NUR 613	Pharmacology and Therapeutics	3
NUR 742	Program Evaluation and Methods	3
NUR 614	Assessment and Diagnostic Reasoning for Advanced Nursing Practice	3
NUR 743	Evidence-Based Practice Strategies	3
NUR 738L	DNP Project Development	2-3
NUR 739L	DNP Project Implementation and Evaluation (Students will also take NQI 702 for 3 credit hours) May be repeated multiple times for minimum total of 7 hours	1-5
Total Hours		**42-47**

Students will also take NQI 702 for 3 credit hours

Family Nurse Practitioner Concentration additional required courses

Requirements		Hours
NFH 618L	Focus on Advanced Nursing Practice Specialization	3
NFH 721	Advanced Family Nursing I	5
NFH 722	Advanced Family Nursing II	4
NFH 723	Advanced Family Nursing III	5
NFH 785L	Practicum I: Family Nurse Practitioner	3
NFH 786L	Practicum II: Family Nurse Practitioner	3
NFH 792L	Practicum III: Family Nurse Practitioner	4
Total Hours		**27**

Neonatal Nurse Practitioner Concentration additional required courses

Requirements		Hours
NNE 618L	Focus on Advanced Nursing Practice Specialization	3
NNE 721	Advanced Neonatal Nursing I	5
NNE 722	Advanced Neonatal Nursing II	4
NNE 723	Advanced Neonatal Nursing III	5
NNE 784L	Practicum I: Neonatal Nurse Practitioner	3
NNE 785L	Practicum II: Neonatal Nurse Practitioner	3
NNE 792L	Practicum III: Neonatal Nurse Practitioner	4
Total Hours		**27**

Adult Gerontology Acute Care Nurse Practitioner Concentration additional required courses

Requirements		Hours
NCA 618L	Focus on Advanced Nursing Practice Specialization	3
NCA 721	Advanced Adult/Gerontology Nursing I -Acute Care	5
NCA 722	Advanced Adult/Gerontology Nursing II -Acute Care	4
NCA 723	Advanced Adult/Gerontology Nursing III -Acute Care	5
NCA 785L	Practicum I: Adult/Gerontology Nurse Practitioner-Acute Care	3
NCA 786L	Practicum II: Adult/Gerontology Nurse Practitioner-Acute Care	3
NCA 792L	Practicum III: Adult/Gerontology Nurse Practitioner-Acute Care	4
Total Hours		**27**

Pediatric Primary Care Nurse Practitioner Concentration additional required courses

Requirements		Hours
NPE 618L	Focus on Advanced Nursing Practice Specialization	3
NPE 721	Advanced Pediatric Nursing I - Primary Care	5
NPE 722	Advanced Pediatric Nursing II - Primary Care	4
NPE 723	Advanced Pediatric Nursing III - Primary Care	5
NPE 785L	Practicum I: Pediatric Nurse Practitioner - Primary Care	3
NPE 786L	Practicum II: Pediatric Nurse Practitioner –Primary Care	3
NPE 792L	Practicum III: Pediatric Nurse Practitioner - Primary Care	4
Total Hours		**27**

Psychiatric/Mental Health Nurse Practitioner Concentration additional required courses

Requirements		Hours
NPN 618L	Focus on Advanced Nursing Practice Specialization	3
NPN 721	Advanced Psychiatric/Mental Health Nursing I	5
NPN 722	Advanced Psychiatric/Mental Health Nursing II	5
NPN 723	Advanced Psychiatric/Mental Health Nursing III	5
NPN 785L	Practicum I: Psychiatric/Mental Health Nurse Practitioner	3
NPN 786L	Practicum II: Psychiatric/Mental Health Nurse Practitioner	3
NPN 792L	Practicum III: Psych Mental Health Nurse Practitioner	4
Total Hours		**28**

Adult-Gerontology Primary Care Nurse Practitioner Concentration additional required courses

Requirements		Hours
NAH 618L	Focus on Advanced Nursing Practice Specialization	3
NAH 721	Advanced Adult Gerontology Nursing I - Primary Care	5
NAH 722	Advanced Adult Gerontology Nursing II - Primary Care	4
NAH 723	Advanced Adult Gerontology Nursing III - Primary Care	5
NAH 785L	Practicum I: Adult/Gerontology Nurse Practitioner - Primary Care	3
NAH 786L	Practicum II: Adult/Gerontology Nurse Practitioner - Primary Care	3
NAH 792L	Practicum III: Adult-Gerontology Nurse Practitioner	4
Total Hours		**27**

Pediatric Acute Care Nurse Practitioner Concentration additional required courses

Requirements		Hours
NCC 618L	Focus on Advanced Nursing Practice Specialization	3
NCC 721	Advanced Pediatric Nursing I - Acute Care	5
NCC 722	Advanced Pediatric Nursing II - Acute Care	4
NCC 723	Advanced Pediatric Nursing III - Acute Care	5
NCC 785L	Practicum I: Pediatric Nurse Practitioner Acute Care	3
NCC 786L	Practicum II: Pediatric Nurse Practitioner - Acute Care	3
NCC 792L	Practicum III: Pediatric Nurse Practitioner - Acute Care	4
Total Hours		**27**

Women's Health Care Nurse Practitioner Concentration additional required courses

Requirements		Hours
NWH 618L	Focus on Advanced Nursing Practice Women	3
NWH 731	Advanced Women’s Health Nursing I	5
NWH 732	Advanced Women’s Health Nursing II	4
NWH 733	Advanced Women’s Health Nursing III	5
NWH 785L	Practicum I: Women’s Health Nurse Practitioner	3
NWH 786L	Practicum II: Women’s Health Nurse Practitioner	3
NWH 792L	Practicum III: Women’s Health Nurse Practitioner	4
Total Hours		**27**

Master of Science in Nursing to Doctor of Nursing Practice Pathway

Admissions Requirements

- A master’s degree in an area of advanced nursing practice (nurse practitioner, clinical nurse specialist, nursing administration, or nurse anesthetist) from a regionally accredited institution, equivalent to that in the UAB School of Nursing. Students must hold an advanced practice certification or be eligible to sit for advanced certification and pass their specific certification exam prior to completing 12 credit hours of coursework. Until advanced certification is achieved, students will be considered as a conditional admit.
- A graduate grade point average of at least 3.0 overall (based on a 4.0 scale) or in the last 60 hours of earned credit.
- Three favorable completed Evaluation Forms from persons who have knowledge of the applicant’s potential for success for graduate nursing studies and advanced-practice nursing.
- Current professional certification as an advanced practice nurse where applicable.
- Evidence of an unencumbered license as a (1) registered nurse, and (2) advanced nursing practice or eligibility in the state in which they plan to practice plus (3) CPR certification; all documents must be notarized if applicant is not a licensed nurse in Alabama.
- Personal goal statement that is congruent with the program goals (300 words or less)
- Resume or curriculum vitae.
- A personal interview by phone or in person with a School of Nursing faculty member or designee may be requested to verify application data

Degree Requirements

Requirements		Hours
NUR 701	Writing for Publication	3
NUR 729	Evidence-Based Practice Design and Translation	3
NUR 731	Philosophical, Theoretical, and Conceptual Foundations for Advanced Practice Nursing	3
NUR 733	Informatics for Advanced Practice Nursing	3
NUR 735	Population Health in Advanced Practice Nursing	3
NUR 737	Interprofessional Leadership and Role Development for Practice Excellence	3
NUR 738L	DNP Project Development	3
NUR 739L	DNP Project Implementation and Evaluation (Students will take 739L multiple time for a minimum of 7 hours) [1]	1-7
NUR 740	Health Policy and Politics: Implications in Health Care	3
NUR 742	Program Evaluation and Methods	3
NUR 743	Evidence-Based Practice Strategies	3
NUR 745	Foundations of Scholarly Writing Students will also take NQI 702 for 3 credit hours	3
Total Hours		**34-40**

[1] May be repeated, minimum 7 to graduate

MSN to DNP Pathway for Nurse Executives

Requirements		Hours
NEX 701	Culture of Health, Quality & Safety	3
NEX 703	Models & Theory for Healthcare Development & Improvement	3
NEX 744	Organization Improvement & Program Evaluation Strategies	5
NEX 704	Healthcare Technologies, Innovations & Analytics for Executive Leaders	5
NEX 705	Healthcare Finance Strategies	3
NEX 708	Strategic Leadership for Healthcare System Transformation	6
NEX 706	Contemporary Issues: Global & National Perspectives	3
NEX 709	Population Health for Healthcare Transformation Students will also take NEX 758 Research & Health Policy for 3 credit hours	3
Total Hours		**31**

Nurse Leadership in Population Health Pathway

Requirements		Hours
NHP 701	Essentials of Population Health Science	3
NHP 702	Population Health: Organization, Delivery, and Financing	3
NHP 703	Principles of Epidemiology and Population Health Analytics	3
NHP 704	Population Health: Quality and Safety Supporting Accountable Care	3
NHP 705	Population Health: Program Design and Evaluation	3
NHP 706	Population Health: Program Design and Evaluation	3
NHP 707	Population Health Practicum I	2
NHP 708	Population Health Practicum II	2
Total Hours		**22**

Additional Requirements for Completion

Candidates for the DNP degree must complete the following requirements: Completion of all coursework and clinical experiences based on the student's Program of Studies, with an overall GPA of 3.0 or better, and grades of B or better in all required courses in the School of Nursing.

Dual DNP-PhD Pathway

Requirements		Hours
NUR 737	Interprofessional Leadership and Role Development for Practice Excellence	3
NUR 735	Population Health in Advanced Practice Nursing	3
NUR 740	Health Policy and Politics: Implications in Health Care	3
NUR 729	Evidence-Based Practice Design and Translation	3
NUR 742	Program Evaluation and Methods	3
NUR 733	Informatics for Advanced Practice Nursing	3
NUR 743	Evidence-Based Practice Strategies	3
NQI 702	Clinical Data Management and Application for Improvement	3
NUR 738L	DNP Project Development	2-3
NUR 739L	DNP Project Implementation and Evaluation	1-5
NUR 751	Philosophical Foundations of Science	3
NUR 753	Nursing as a Scientific Discipline	2
NRM 750	Foundations of Quantitative Research	3
NRM 798L	Research Immersion	3-6
NRM 780	Application of Research Design Principles I	3
NRM 778	Mixed Methods Research II: Designing and Conducting a Mixed Methods Study	3
NRM 752	Responsible Conduct of Research	3
NRM 781	Quantitative Measurement in Research	3
NRM 782	Application of Research Design Principles II	3
NRM 783	Foundations of Qualitative Research	3
NST 758	Inferential Statistics I	3
NST 779	Statistical Modeling I - Linear Models	3
NST 780	Statistical Model II - Topics in Multivariate Analysis	3
NUR 758	Research and Health Policy	3
NUR 797	Writing the Dissertation	3
NUR 791	Independent Study in Clinical Nursing	1-9
NUR 799	Dissertation Research [2]	1-9
NUR Electives [1]		**6**
Total hours for program will be 118, with 34 DNP and 84 PhD		
Total Hours		**79-103**

[1] Students will take 6 credits of elective coursework.
[2] Students will take multiple semesters for 18 hours total.

Degree Offered:	Ph.D.
Director (Ph.D.)	Dr. Edwin Aroke
Phone:	(205) 975-5700
E-mail:	earoke@uab.edu

Ph.D. Program Description

The Doctor of Philosophy in Nursing is designed to prepare professional nurses as scholars, leaders, and researchers who will make a substantive contribution to the body of knowledge for the discipline of nursing and thereby improve health outcomes for those who receive nursing care. The program of studies builds on preparation at the master's or baccalaureate level. Graduates are prepared for culturally effective leadership roles

in research and science, education, health policy, and health care. Doctoral students have the opportunity to develop expertise and conduct research in a selected content area. In addition to structured coursework, the program builds upon a mentorship model which recognizes that research skills are learned most effectively by working with a faculty research mentor who provides opportunities to practice the use of research techniques and the design and execution of original research within a focused program of research. In addition to core program course requirements, students complete at least 12 credits of required courses and electives in a selected content area. The PhD program was initiated in 1999. Initiated in 2000, the Post-Bachelor's PhD Option allows individuals with baccalaureate degrees in nursing to complete the PhD in nursing without first obtaining a master's degree.

Ph.D. Program Goals

The PhD curriculum prepares graduates to examine models, concepts and theories for their application in expanding the body of nursing and health care knowledge to: contribute to nursing science and health care through research that is disseminated in professional publications and presentations to the scientific communities and health care consumers; to conduct health care investigations based upon scientifically sound conceptual and methodological decisions about research designs, measures, and analytic methods; to reflect a consistent commitment to scientific integrity in the design, conduct, and dissemination of research; to initiate and collaborate in interdisciplinary research and scholarly endeavors that contribute to health outcomes in a culturally effective manner; and to assume leadership roles in research and scholarship.

Ph.D. Admission Requirements

- A Master of Science in Nursing (MSN) degree from an accredited institution in the United States, or approved by the Minister of Education for schools of nursing in foreign countries, equivalent to that in the UAB School of Nursing;
- A minimum grade point average of 3.0 overall (based on a 4.0 scale) on all graduate level coursework;
- Completion of GRE within the past 5 years;
- For applicants from non-English speaking countries: a satisfactory TOEFL score (minimum 550);
- Computer literacy and access is required, with proficiency in word processing and e-mail correspondence, as well as familiarity and experience with the Internet. It is recommended that each student have their own personal computer meeting the specifications of the School of Nursing. (Specifications are available from the School of Nursing website);
- Eligibility for licensure as a Registered Nurse in the United States;
- A written goal statement which evidences congruence between the applicant’s research interests and School of Nursing faculty research;
- At least one sample of independent written work (in English) that demonstrates the applicant’s scholarship potential. Representative examples include a paper, proposal, report, or publication;
- A current curriculum vitae;
- Three references from individuals with expertise to comment on the applicant’s capability for research and scholarship (for example, University professors, employers); at least one of the references must be from a doctorally prepared nurse, and;
- A personal interview.

NOTE: For the Post-Baccalaureate PhD option, the corresponding requirements are:

- A Bachelor of Science in Nursing (BSN) degree from an accredited institution in the United States, or approved by the Minister of Education for schools of nursing in foreign countries, equivalent to that in the UAB School of Nursing;
- A minimum grade point average of 3.0 overall (based on a 4.0 scale) on all undergraduate level coursework;
- Completion of GRE within the past 5 years;
- For applicants from non-English speaking countries: a satisfactory TOEFL score (minimum 550);
- Computer literacy and access is required, with proficiency in word processing and e-mail correspondence, as well as familiarity and experience with the Internet. It is recommended that each student have their own personal computer meeting the specifications of the School of Nursing. (Specifications are available from the School of Nursing website);
- Eligibility for licensure as a Registered Nurse in the United States;
- A written goal statement which evidences congruence between the applicant’s research interests and School of Nursing faculty research;
- At least one sample of independent written work (in English) that demonstrates the applicant’s scholarship potential. Representative examples include a paper, proposal, report, or publication;
- A current curriculum vitae;
- Three references from individuals with expertise to comment on the applicant’s capability for research and scholarship (for example, University professors, employers); at least one of the references must be from a doctorally prepared nurse, and;
- A personal interview.

Ph.D. Degree Requirements

Candidates for the degree of Doctor of Philosophy in Nursing must complete the following requirements:

- Coursework and experiences based on the student's background and substantive area, with an overall GPA of 3.0 or better, and grades of B or better in all required courses on the approved program of studies;
- A comprehensive examination administered upon completion of an individualized program of studies; and
- A written dissertation demonstrating competence in research, individual inquiry, critical analysis using sophisticated statistical and/or qualitative techniques, and in-depth treatment of a health care problem in the selected content area. The investigation must make a genuine scientific contribution to knowledge, concepts, and theories in nursing. A final defense of the dissertation is required.

Postdoctoral Study

Postdoctoral studies in nursing are individually arranged based on a student's learning needs in specific areas of interest that match the strengths of the graduate faculty. The focus of postdoctoral study is on expanding and extending the student's knowledge base in nursing theory, practice, research, statistics and data management, and generally centers on a research effort of mutual interest to the student and faculty mentor.

Dual DNP-PhD Degree

A dual DNP-PhD degree prepares graduates to lead improvements in practice supportive of population health and health system change, and expand that focus into a related research area to generate new knowledge. The curriculum combines the core content from the two programs to prepare a clinical nurse scholar who desires to merge clinical leadership with scientific inquiry to advance nursing science and improve clinical practice. This pathway is open to MSN-prepared nurses with certification in an advanced practice role. Please see the DNP page for information on coursework.

Advanced Practice Provider Management of Neurological Conditions of Aging Certificate

The **Advanced Practice Provider Management of Neurological Conditions of Aging Certificate** coursework prepares nurse practitioners and other advanced practice providers with advanced knowledge and skills to manage the care of older adults with memory and movement disorders. The overall aim is to prepare healthcare providers to long term management for older adults with neurological conditions.

Three, 4-credit hour courses and one 3-credit hour course are offered that together provide a strong foundation for employment in academic and health care settings. All four courses are required to be awarded the certificate in Advanced Practice Provider Management of Neurological Conditions of Aging.

To best accommodate the needs of the healthcare nursing workforce, the courses are delivered through a distance accessible format that combines asynchronous and synchronous online classes.

Admission is limited to Summer entry only.
Summer 2025 deadline: December 31, 2024

Specific Admission Requirements:

- Only credentialed advanced practice providers with completed graduate or doctoral degree (nurse practitioner, physician assistant, medical resident, or physician) will be considered for admission.
- Cumulative graduate grade point average of at least 3.0 on a 4.0 scale or on the last 60 semester hours.
- Submit three letters of professional reference attesting to the applicant's potential for graduate study.
- Applicants should submit an official transcript from every college or university they have ever attended (even if for only one semester). Transcripts may be:
  - Emailed electronically by the issuing institution to the UAB Graduate School at gradschool@uab.edu, or
  - Mailed to UAB Graduate School at LHL G03, 1720 2nd Ave. South, Birmingham, AL 35294-0013

Requirements		Hours
NCN 621	Neurobiological Foundations of Cognition and Movement Disorders	4
NCN 622	Neuropsychopharmacology	4
NCN 623	Diagnosis and Management or Neurological Disorders	4
NCN 624	Post-Diagnostic Needs of the Neurological Patient, Caregiver, and Care Systems	3
Total Hours		**15**

Clinical Research Management Graduate Certificate

The graduate certificate in **Clinical Research Management (CRM)** is for bachelor's prepared individuals seeking a new career path in the healthcare field.

Individuals who complete the certificate program are prepared to lead and manage research teams in implementing clinical trials research while ensuring compliance with federal regulations for patient safety and the efficacy of the research findings.

Admission is limited to Fall entry only.
Fall 2024 deadline: June 1, 2024

Specific Admission Requirements:

- Have a bachelor's degree.
- An undergraduate (or graduate) GPA of at least 3.0 overall (based on a 4.0 scale) or in the last 60 hours of earned credit.
- Applicants should submit an official transcript from every college or university they have ever attended (even if for only one semester). Transcripts may be:
  - Emailed electronically by the issuing institution to the UAB Graduate School at gradschool@uab.edu, or
  - Mailed to UAB Graduate School at LHL G03, 1720 2nd Ave. South, Birmingham, AL 35294-0013

Requirements		Hours
CRM 670	Clinical Rsearch Ethics, Methods and Clinical Trials	3
CRM 671	Clinical Research Study Operations and Site Management	3
CRM 673	Current Issues in Clinical Research Management	3
CRM 672	An Overview of Teaching Principles for Clinical Research Coordinators and Healthcare Professionals	3
CRM 674	Practicum Experiences in Clinical Research Management	3
Total Hours		**15**

Nurse Executive Certificate

The **Nurse Executive Certificate** pathway prepares graduates at the highest level in executive leadership in healthcare and to address complex health system issues. Graduates of the Nurse Executive Certificate pathway lead population and community based health services with an emphasis on improving access and quality for diverse populations.

The curriculum is offered in a distance accessible format that combines core courses offered via an online program with required on-campus intensives (4 days each).

Admission is limited to Spring entry only.
Spring 2025 deadline: October 4, 2024

Specific Admission Requirements:

- Evidence of an unencumbered and unrestricted licensed as a registered nurse.
- Have a DNP or PhD in nursing and currently working in a mid-level or senior leadership role in a practice or academic setting
- A graduate GPA of at least 3.0 overall (based on a 4.0 scale) or in the last 60 hours of earned credit.

- Applicants should submit an official transcript from every college or university they have ever attended (even if for only one semester). Transcripts may be:
  - Emailed to the UAB Graduate School at gradschool@uab.edu, **or**
  - Mailed to UAB Graduate School at LHL G03, 1720 2nd Ave. South, Birmingham, AL 35294-0013
- Submission of three favorable evaluations by persons who have knowledge of the applicant's potential for success in graduate nursing studies and executive leadership.
- Submission of a personal goal statement that is congruent with the Nurse Executive Certificate (300 words or less).
- Resume/CV
- If admitted to the DNP program, students must show proof of completion of a descriptive statistics course, equivalent to UAB's MA-180, before starting the program

Requirements		Hours
NEX 705	Healthcare Finance Strategies	3
NEX 703	Models & Theory for Healthcare Development & Improvement	3
NEX 708	Strategic Leadership for Healthcare System Transformation	6
NEX 709	Population Health for Healthcare Transformation	3
NEX 711 Policy Perspectives for Executive Leadership		3
Total Hours		**18**

Nurse Leadership in Quality and Safety

his post-graduate certificate program is for doctorally prepared nurses with the competencies necessary to leading efforts to improve the quality and safety of the health care systems in which they work. Key competencies include patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, informatics and safety.

Nurses who complete the certificate program are prepared to lead health system change that supports the delivery of quality nursing care in care environments designed to eliminate threats to patient safety informed by clinical data used to identify populations at highest risk for poor outcomes and scientific evidence in support of best-practices.

Admission is limited to Fall entry only.
Fall 2024 deadline: May 1, 2024

Specific Admission Requirements:

- Evidence of an unencumbered and unrestricted licensed as a registered nurse.
- Have a DNP or PhD in nursing.
- A graduate GPA of at least 3.0 overall (based on a 4.0 scale) or in the last 60 hours of earned credit.
- Submit three letters of professional reference attesting to the applicant's potential for graduate study.
- Applicants should submit an official transcript from every college or university they have ever attended (even if for only one semester). Transcripts may be:
  - Emailed electronically by the issuing institution to the UAB Graduate School at gradschool@uab.edu, or
  - Mailed to UAB Graduate School at LHL G03, 1720 2nd Ave. South, Birmingham, AL 35294-0013

Requirements		Hours
NQI 701	Improvement Science for Nursing Practice and Education	4
NQI 702	Clinical Data Management and Application for Improvement	3
NHP 701	Essentials of Population Health Science	3
NQI 704	Quality Improvement and Patient Safety Education in Nursing	4
NQI 703	Introduction to Implementation Science	4
Total Hours		**18**

CRM - Clinical Research Mgmnt Courses

CRM 670. Clinical Rsearch Ethics, Methods and Clinical Trials. 3 Hours.
This course provides clinical research personnel and advanced practice nurses with an introduction to historical, cultural, and ethical influences on clinical research, and introduces concepts related to good clinical practice guidelines. The course also addresses concepts of scientific integrity, scientific misconduct, the informed consent process, research methods and clinical trials.

CRM 671. Clinical Research Study Operations and Site Management. 3 Hours.
This course provides clinical research personnel and advanced practice nurses with an introduction to principles of study and site management for the development, implementation and evaluation of clinical research, and expands concepts related to good clinical practice guidelines.

CRM 672. An Overview of Teaching Principles for Clinical Research Coordinators and Healthcare Professionals. 3 Hours.
This course provides clinical research personnel and advanced practice nurses with an introduction and overview of teaching principles that are applicable to clinical and clinical research venues.

CRM 673. Current Issues in Clinical Research Management. 3 Hours.
This course provides students with an opportunity to expand critical learning and application of clinical research management topics through review of current literature and use of available resources.
Prerequisites: (CRM 670 [Min Grade: C] and CRM 671 [Min Grade: C] and CRM 672 [Min Grade: C]) or (CRM 670 [Min Grade: C] and CRM 671 [Min Grade: C] and CRM 672 [Min Grade: C])

CRM 674. Practicum Experiences in Clinical Research Management. 3 Hours.
This course provides students with an opportunity to expand learning experiences that validate cognitive, affective, and psychomotor skill sets of CRNS: and includes an opportunity to develop additional learning objectives and practicum experiences that will culminate in a project that fulfills learning goals.

NA-Nursing Anesthesia Courses

NA 697. Special Topics. 3 Hours.
Review of specialty concepts as presented in Anesthesia Pathophysiology I, Anesthesia Pathophysiology II, and Anesthesia for Surgical Specialties.

NA 698. Graduate Project. 2 Hours.
Critical review of literature for an anesthesia topic with preparation of a scholarly product for dissemination.

NA 702. Anatomy & Physiology for Nurse Anesthetists. 6 Hours.
This course is a study of histology, genetics, human anatomy and physiology, with an emphasis in neuroanatomy and neurophysiology. NA 702 integrates the structure, function, and organization of nervous tissue from the cellular through gross anatomic aspects including central, peripheral, and autonomic portions of the system. The course includes a series of clinical correlation laboratory experiences, team-based learning projects, and lectures designed to support and augment basic science content.
Prerequisites: NA 720 [Min Grade: B] or NA 731 [Min Grade: B]

NA 708L. Anesthesia Practicum I. 2 Hours.
This course is designed to provide a foundation in the basic principles and practice of nurse anesthesia. During this semester, clinical experiences are designed to provide the students with development of anesthesia practice, and to apply knowledge of basic and advanced principles of anesthetic management in surgical specialty areas.
Prerequisites: NA 721 [Min Grade: B] and NA 740 [Min Grade: B] and NA 770 [Min Grade: B] and NUR 614 [Min Grade: B]

NA 709L. Anesthesia Practicum II. 3 Hours.
This course is designed to provide a foundation in the basic principles and practice of nurse anesthesia. During this semester, clinical experiences are designed to provide the students with continues development of anesthesia practice, and to apply knowledge of basic and advanced principles of anesthetic management in surgical specialty areas.
Prerequisites: NA 708L [Min Grade: P] and NA 741 [Min Grade: B] and NA 750 [Min Grade: B] and NA 771 [Min Grade: B]

NA 710L. Anesthesia Practicum III. 5 Hours.
This course is designed to provide a foundation in the basic principles and practice of nurse anesthesia. During this semester, clinical experiences are designed to provide the students with continued development of anesthesia practice, and the apply knowledge of basic and advanced principles of anesthetic management in surgical specialty areas.
Prerequisites: NA 709L [Min Grade: P] and NA 745 [Min Grade: B] and NA 733 [Min Grade: B]

NA 711L. Anesthesia Specialty Immersion I. 5 Hours.
This course is designed to provide advanced clinical experiences requisite for preparation consistent with a doctoral evidence-based practice of nurse anesthesia. During this semester, clinical experiences are designed to provide the advanced student with clinical experiences to further their knowledge base towards a doctoral level.
Prerequisites: NA 710L [Min Grade: P] and NA 740 [Min Grade: B] and NA 742 [Min Grade: B]

NA 712L. Anesthesia Specialty Immersion II. 5 Hours.
This course is designed to provide advanced clinical experiences requisite for preparation consistent with a doctoral evidence-based practice of nurse anesthesia. During this semester, clinical experiences are designed to provide the advanced students with clinical experiences to further their knowledge base towards a doctoral level.
Prerequisites: NA 711L [Min Grade: P] and NA 795 [Min Grade: P] or NA 795 [Min Grade: B] and NUR 738L [Min Grade: P] or NUR 738L [Min Grade: B]

NA 713L. Anesthesia Specialty Immersion III. 5 Hours.
This course is designed to provide advanced clinical experiences requisite for preparation consistent with a doctoral evidence-based practice of nurse anesthesia. During this semester, clinical experiences are designed to provide the advanced student with clinical experiences to further their knowledge base towards a doctoral level.
Prerequisites: NA 712L [Min Grade: P] and NA 796 [Min Grade: P] or NA 796 [Min Grade: B] and NUR 739L [Min Grade: P]

NA 718L. Focus on Advanced Nursing Practice Specialization. 4 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: NA 702 [Min Grade: B] and NA 731 [Min Grade: B] and NUR 735 [Min Grade: B] and NQI 702 [Min Grade: B]

NA 720. Anesthesia Pharmacology I. 3 Hours.
This course is designed to provide the nurse anesthesia student with knowledge of various non-anesthetic pharmacological agents and their anesthetic implications. During this course, students will learn pharmacological principles related to advanced practice nursing at the doctoral level.

NA 721. Anesthesia Pharmacology II. 3 Hours.
This course is designed to provide the nurse anesthesia student with knowledge of various anesthetic pharmacological agents and their anesthetic implications. During this course, students will build upon knowledge gained from NA 720, and further master advanced pharmacological principles related to advanced practice nursing at the doctoral level.
Prerequisites: NA 702 [Min Grade: B] and NA 731 [Min Grade: B]

NA 731. Biochemistry & Physics for Nurse Anesthetists. 4 Hours.
This course provides a solid chemistry, biochemistry, and physics foundation that is necessary for the safe practice of nurse anesthesia. Students will gain an understanding of these sciences, their clinical relevance, and how they apply to human beings and anesthesia equipment. This course is foundational in nature and success will help the student prepare for upcoming clinical anesthesia management courses.
Prerequisites: NA 720 [Min Grade: B]

NA 733. Theory, Concepts and Writing for Nurse Anesthetists. 3 Hours.
The purpose of this course is to provide an introduction to the field of nursing informatics for nurse anesthetists. This course focuses on the collection, organization, analysis, and dissemination of information in nurse anesthesia and health care. Students are introduced to the information system life-cycle and the use of technology to enhance nursing care delivery and patient safety in perioperative settings.

NA 740. Anesthesia Principles I. 4 Hours.
The purpose of this course is to provide a beginning foundation for students to plan and implement safe anesthesia care in healthy patients. The focus of this course is the study of scientific foundations of nurse anesthesia practice. The emphasis on designing and implementing individualized anesthesia care plans, principles of anesthesia induction, maintenance, emergence, anesthesia complications ion the health patient, routine and difficult airway management, and the principles of nurse anesthesia role transition and practice standards.
Prerequisites: NA 702 [Min Grade: B] and NA 731 [Min Grade: B]

NA 741. Anesthesia Principles II. 3 Hours.
This course is for the student who has a foundation in the basic principles and practice of nurse anesthesia. During this course, students will learn anesthetic management principles for surgical specialty areas. Upon course completion the student will demonstrate mastery of related anatomic, physiologic, pathophysiologic, and pharmacologic principles for each of the surgical specialty areas in the context of advanced nursing practice at the doctorate level.
Prerequisites: NA 721 [Min Grade: B] and NA 740 [Min Grade: B] and NA 770 [Min Grade: B]

NA 742. Anesthesia Principles III. 3 Hours.
Students will learn anesthetics management principles for parturients, neonates, infants and children. During this course, students will learn anesthetic management principles for surgical specialty areas. Upon course completion the students will demonstrate mastery of related anatomic, physiologic, pathophysiologic, and pharmacologic principles across special populations in the context of advanced nursing practice at the doctorate level.
Prerequisites: NA 708L [Min Grade: P] and NA 741 [Min Grade: B] and NA 750 [Min Grade: B] and NA 771 [Min Grade: B]

NA 745. Professional Aspects. 4 Hours.
This course is designed to provide the foundation of the professional aspects of becoming a CRNA. The students will demonstrate understanding of the principles associated with the business of anesthesia including finance, practice management, as well as intra and inter-professional healthcare collaboration.
Prerequisites: NA 708L [Min Grade: P] and NA 741 [Min Grade: B] and NA 750 [Min Grade: B] and NA 771 [Min Grade: B]

NA 750. Regional Anesthesia. 3 Hours.
The purpose of this course is the study of the theoretical and practical considerations involved in the administration and management of regional anesthesia and pain management. Related anatomy, physiology, and pharmacology will be reviewed as applied to the administration and management of regional anesthesia and pain management, using ultrasound and radiological techniques. Various regional anesthesia, both central and peripheral, are discussed as a component of a safe and effective anesthetic.
Prerequisites: NA 721 [Min Grade: B] and NA 740 [Min Grade: B] and NA 770 [Min Grade: B] and NUR 614 [Min Grade: B]

NA 770. Anesthesia Pathophysiology I. 3 Hours.
This Pathophysiology course is designed to promote the understanding and application of fundamental disease processes in clinical settings. General concepts of disease, including etiology, pathogenesis, and clinical significance are presented. These concepts are applied in systems-orientate approach to disease processes affecting cardiovascular and pulmonary systems. Application of this knowledge to anesthetic plan development and implication of anesthesia on the disease process will be expected.
Prerequisites: NA 702 [Min Grade: B] and NA 731 [Min Grade: B]

NA 771. Anesthesia Pathophysiology II. 3 Hours.
This pathophysiology course is designed to promote the understanding and application of fundamental disease processes in clinical settings. General concepts of disease, including etiology, pathogenesis, and clinical significance are presented. These concepts are applied in a systems-oriented approach to disease processes affecting musculoskeletal, renal, nervous, gastrointestinal, immune, hematological and endocrine systems. Application of the knowledge to anesthetic plan development and implications of anesthesia on the disease process, and vice versa, will be expected.
Prerequisites: NA 721 [Min Grade: B] and NA 740 [Min Grade: B] and NA 770 [Min Grade: B] and NUR 614 [Min Grade: B]

NA 787. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the students' knowledge base.

NA 795. Critical Concepts I. 3 Hours.
The purpose of this course is to foster academic development and integration of theoretical knowledge into clinical practice. The focus is on clinically relevant reviews and examinations of critical anesthesia concepts.
Prerequisites: NA 710L [Min Grade: P] and NA 740 [Min Grade: B] and NA 742 [Min Grade: B]

NA 796. Critical Concepts II. 3 Hours.
The purpose of this course is to foster continued academic development and integration of theoretical knowledge into clinical practice. The focus is on increasingly advanced clinically relevant reviews and examinations of critical anesthesia concepts. The emphasis is on advanced critical thinking ability and the synthesis of anesthesia concepts.
Prerequisites: NA 711L [Min Grade: P] and NA 795 [Min Grade: P] and NUR 738L [Min Grade: P]

NA 797. Critical Concepts III. 3 Hours.
The purpose of this course is to foster integration of advanced theoretical knowledge into complex scenarios in clinical practice. The focus is on the culmination of clinical review and examination of critical anesthesia concepts necessary for the beginning nurse anesthesia practitioner to demonstrate critical thinking and application of knowledge in the clinical practice setting. The emphasis is on development of complex critical thinking ability and the synthesis of anesthesia concepts.
Prerequisites: NA 712L [Min Grade: P] and NUR 739L [Min Grade: P] and (NA 796 [Min Grade: P] or NA 796 [Min Grade: B])

NAH-Nursing - Adult Health Courses

NAH 618L. Focus on Advanced Nursing Practice Specialization. 3 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: (NUR 606 [Min Grade: B] or NUR 729 [Min Grade: B] or NUR 737 [Min Grade: B]) and (NUR 613 [Min Grade: B]) and NUR 614 [Min Grade: B](Can be taken Concurrently)

NAH 621. Advanced Adult Gerontology Nursing I - Primary Care. 4-5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role of the Advanced Practice Nurse. The emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to adult/gerontology patients.
Prerequisites: (NUR 610 [Min Grade: B] or NUR 735 [Min Grade: B]) and (NUR 614L [Min Grade: B] or NUR 614 [Min Grade: B])

NAH 622. Advanced Adult Gerontology Nursing II - Primary Care. 3-5 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness of adult/gerontology patients. The focus of this course is on health promotion and disease prevention and management strategies from inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care to adult/gerontology patients.
Prerequisites: (NAH 621 [Min Grade: B] or NAH 621 [Min Grade: B]) and (NAH 685L [Min Grade: P] or NAH 685L [Min Grade: P])

NAH 623. Advanced Adult Gerontology Nursing III - Primary Care. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course is on the utilization of complex models and systems of practice to deliver high quality evidence-based care to adults/gerontology patients. The emphasis of the course is on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: (NAH 622 [Min Grade: B] or NAH 622 [Min Grade: B]) and (NAH 686L [Min Grade: P] or NAH 686L [Min Grade: P])

NAH 685L. Practicum I: Adult/Gerontology Nurse Pracitioner. 2-3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to adult/gerontology patients. The focus of this course is on the delivery of health care services to adult/gerontology patients. The emphasis of this course is on promoting the progression of competence within the Advanced Practice Nursing role.
Prerequisites: (NUR 610 [Min Grade: B] or NUR 610 [Min Grade: B] and NUR 735 [Min Grade: B] or NUR 735 [Min Grade: B]) and NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B]

NAH 686L. Practicum II: Adult/Gerontology Nurse Practitioner - Primary Care. 2-3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to adult/gerontology patients. The focus of this course is to provide the student with opportunities to integrate in depth diagnostic and management skills to provide care for adult/gerontology patients. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: (NAH 621 [Min Grade: B] or NAH 621 [Min Grade: B]) and (NAH 685L [Min Grade: P] or NAH 685L [Min Grade: P])

NAH 687. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the students' knowledge base.

NAH 692L. Practicum III: Adult/Gerontology Nurse Practitioner - Primary Care. 2-4 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to adult/gerontology patients. The focus of this course is to evaluate progress toward achievement of professional competencies. The emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of adult/gerontology patients.
Prerequisites: (NAH 622 [Min Grade: B] or NAH 622 [Min Grade: B]) and (NAH 686L [Min Grade: P] or NAH 686L [Min Grade: P])

NAH 718L. Focus on Advanced Nursing Practice. 3 Hours.
The purpose of this course is the study of specialty track-specific topics. The focus of the course is to provide foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: NUR 612 [Min Grade: B] and NUR 613 [Min Grade: B] and NUR 614 [Min Grade: B](Can be taken Concurrently)

NAH 721. Advanced Adult Gerontology Nursing I - Primary Care. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of the course is to prepare the student to implement the role Doctor of Nursing Practice prepared Advanced Practice Nurse. The emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to pediatric adult and elderly populations.
Prerequisites: (NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B]) and NAH 618L [Min Grade: P]

NAH 722. Advanced Adult Gerontology Nursing II - Primary Care. 4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness for adult/gerontology population in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The focus of this course is on the health promotion and disease prevention and the management of strategies form inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care of the adult/gerontology population.
Prerequisites: NAH 721 [Min Grade: B] and NAH 618L [Min Grade: P]

NAH 723. Advanced Adult Gerontology Nursing III - Primary Care. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course in on the utilization of complex models and systems of practice to deliver high quality evidence-based care as a Doctor of Nursing Practice prepared Advanced Practice Nurse to the adult/gerontology population. The emphasis of the course in on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: NAH 722 [Min Grade: B] and NAH 786L [Min Grade: P]

NAH 785L. Practicum I: Adult/Gerontology Nurse Practitioner - Primary Care. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to the adult/gerontology population. The focus of this course is on the delivery of health care services to the adult/gerontology population. The emphasis of this course is on promoting the progression of competence within the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse.

NAH 786L. Practicum II: Adult/Gerontology Nurse Practitioner - Primary Care. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to the adult/gerontology population. The focus of this course is to provide the student with opportunities to integrate in-depth diagnostic, management, and leadership skills in the role of the Doctor of Nursing Practice prepared Advanced practice Nurse to provide care for the adult/gerontology population. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: NAH 721 [Min Grade: B] and NAH 785L [Min Grade: P]

NAH 787. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the students' knowledge base.

NAH 792L. Practicum III: Adult-Gerontology Nurse Practitioner. 4 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to the adult/gerontology population. The focus of this course is to evaluate progress toward achievement of competencies of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of the adult/gerontology population.
Prerequisites: NAH 722 [Min Grade: B] and NAH 786L [Min Grade: P]

NBB-Nursing - Biobehavioral Courses

NBB 761. Biobehavioral Research: State of the Sciences. 3 Hours.
Focuses on in-depth exploration and critical analysis of current biobehavioral interaction research including conceptual and methodological issues. Examines the effectiveness of interventions on biobehavioral domains and health outcomes and identifies future directions for research.

NCA-Nursing - Critical Care Courses

NCA 616. Diagnostic and Therapeutic Procedures for Advanced Acute Care Nursing Practice. 2 Hours.
This course is designed to provide the student with opportunities to obtain advanced knowledge of and to learn advanced clinical skills in diagnostic or therapeutic procedures related to the role of the advanced practice nurse in acute and critical care. Specific content and skills in this course will focus on procedures associated with diagnostic and evaluative monitoring of acutely or critically ill patient. COREQ: NCA 621.

NCA 618L. Focus on Advanced Nursing Practice Specialization. 3 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: (NUR 606 [Min Grade: B] or NUR 606 [Min Grade: B] or NUR 729 [Min Grade: B] or NUR 737 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) and NUR 614 [Min Grade: B](Can be taken Concurrently)

NCA 621. Advanced Adult/Gerontology Nursing I - Acute Care. 4-5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role of the Advanced Practice Nurse. The emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to the emancipated minor (age 13 and older), adult, and geriatric populations.
Prerequisites: (NUR 610 [Min Grade: B] or NUR 610 [Min Grade: B]) or (NUR 735 [Min Grade: B] or NUR 735 [Min Grade: B]) and (NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B]) or (NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B])

NCA 622. Adult Gerontology Acute Care Nursing Practice II. 3-4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness of the emancipated minor (age 13 and older), adult, and geriatric populations. The focus of this course is on health promotion and disease prevention and management strategies from inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care of the emancipated minor (age 13 and older), adult, and geriatric populations.
Prerequisites: (NCA 621 [Min Grade: B] or NCA 621 [Min Grade: B]) and (NCA 685L [Min Grade: P] or NCA 685L [Min Grade: P])

NCA 623. Advanced Adult/Gerontology Nursing III -Acute Care. 3-5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course is on the utilization of complex models and systems of practice to deliver high quality evidence-based care to the emancipated minor (age 13 and older), adult, and geriatric populations. The emphasis of the course is on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: (NCA 622 [Min Grade: B] or NCA 622 [Min Grade: B]) and (NCA 686L [Min Grade: P] or NCS 686L [Min Grade: P])

NCA 685L. Practicum I: Adult/Gerontology Nurse Practitioner- Acute Care. 1-3 Hour.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to the emancipated minor (age 13 and older), adult, and geriatric populations. The focus of this course is on the delivery of health care services to the emancipated minor (age 13 and older), adult, and geriatric populations. The emphasis of this course is on promoting the progression of competence within the Advanced Practice Nursing role.
Prerequisites: (NUR 610 [Min Grade: B] or NUR 610 [Min Grade: B]) or (NUR 735 [Min Grade: B] or NUR 735 [Min Grade: B]) and (NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B])

NCA 686L. Practicum II: Adult/Gerontology Nurse Practitioner-Acute Care. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to the emancipated minor (age 13 and older), adult, and geriatric populations. The focus of this course is to provide the student with opportunities to integrate in depth diagnostic and management skills to provide care for the emancipated minor (age 13 or older), adult, and geriatric populations. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: (NCA 621 [Min Grade: B] or NCA 621 [Min Grade: B]) and (NCA 685L [Min Grade: P] or NCA 685L [Min Grade: P])

NCA 687. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the students' knowledge base.

NCA 692L. Practicum III: Adult/Gerontology Nurse Practitioner-Acute Care. 3-6 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to the emancipated minor (age 13 or older), adult, and geriatric population. The focus of this course is to evaluate progress toward achievement of professional competencies. The emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of the emancipated minor (age 13 or older), adult, and geriatric population.
Prerequisites: (NCA 622 [Min Grade: B] or NCA 622 [Min Grade: B]) and (NCA 686L [Min Grade: P] or NCA 686L [Min Grade: P])

NCA 718L. Focus on Advanced Nursing Practice. 3 Hours.
The purpose of this course is the study of specialty track-specific topics. The focus of the course is to provide foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: NUR 612 [Min Grade: B] and NUR 613 [Min Grade: B] and NUR 614 [Min Grade: B](Can be taken Concurrently)

NCA 721. Advanced Adult/Gerontology Nursing I -Acute Care. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to the emancipated minor (age 13 and older), adult, and geriatric populations.
Prerequisites: (NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B]) and NCA 618L [Min Grade: P]

NCA 722. Advanced Adult/Gerontology Nursing II -Acute Care. 4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness for the emancipated minor (age 13 and older), adult, and geriatric populations in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The focus of this course is on the health promotion and disease prevention and the management of strategies form inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care of the emancipated minor (age 13 and older), adult, and geriatric populations.
Prerequisites: NCA 721 [Min Grade: B]

NCA 723. Advanced Adult/Gerontology Nursing III -Acute Care. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course in on the utilization of complex models and systems of practice to deliver high quality evidence-based care as a Doctor of Nursing Practice prepared Advanced Practice Nurse to emancipated minor (age 13 and older), adult, and geriatric populations. The emphasis of the course in on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: NCA 722 [Min Grade: B] and NCA 786L [Min Grade: P]

NCA 785L. Practicum I: Adult/Gerontology Nurse Practitioner-Acute Care. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to the emancipated minor (age 13 and older), adult, and geriatric populations. The focus of this course is on the delivery of health care services to the emancipated minor (age 13 and older), adult, and geriatric populations. The emphasis of this course is on promoting the progression of competence within the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse.

NCA 786L. Practicum II: Adult/Gerontology Nurse Practitioner-Acute Care. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to the emancipated minor (age 13 and older), adult, and geriatric populations. The focus of this course is to provide the student with opportunities to integrate in-depth diagnostic, management, and leadership skills in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse to provide care for the emancipated minor (age 13 and older), adult, and geriatric populations. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: NCA 721 [Min Grade: B] and NCA 785L [Min Grade: P]

NCA 787. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the students' knowledge base.

NCA 792L. Practicum III: Adult/Gerontology Nurse Practitioner-Acute Care. 4 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to the emancipated minor (age 13 and older), adult, and geriatric populations. The focus of this course is to evaluate progress toward achievement of competencies of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of the emancipated minor (age 13 and older), adult, and geriatric populations.
Prerequisites: NCA 722 [Min Grade: B] and NCA 786L [Min Grade: P]

NCC-Nursing - Child/Adolescent Courses

NCC 618L. Focus on Advanced Nursing Practice Specialization. 3 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) and (NUR 606 [Min Grade: B] or NUR 729 [Min Grade: B] or NUR 737 [Min Grade: B]) and NUR 614 [Min Grade: B](Can be taken Concurrently)

NCC 621. Advanced Pediatric Nursing I - Acute Care. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role of the Advanced Practice Nurse. The emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to children, adolescents and their families.
Prerequisites: (NUR 610 [Min Grade: B] or NUR 610 [Min Grade: B]) or (NUR 735 [Min Grade: B] or NUR 735 [Min Grade: B]) and (NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B]) or (NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B])

NCC 622. Advanced Pediatric Nursing II - Acute Care. 4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness of children, adolescents and their families. The focus of this course is on health promotion and disease prevention and management strategies from inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care to children, adolescents and their families.
Prerequisites: (NCC 621 [Min Grade: B] or NCC 621 [Min Grade: B]) and (NCC 685L [Min Grade: P] or NCC 685L [Min Grade: P])

NCC 623. Advanced Pediatric Nursing III - Acute Care. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course is on the utilization of complex models and systems of practice to deliver high quality evidence-based care to pediatric patients and their families. The emphasis of the course is on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: (NCC 622 [Min Grade: B] or NCC 622 [Min Grade: B]) and (NCC 686L [Min Grade: P] or NCC 686L [Min Grade: P])

NCC 685L. Clinical Practicum I: Advanced Pediatric Nursing - Acute Care. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to children, adolescents and their families. The focus of this course is on the delivery of health care services to children, adolescents and their families. The emphasis of this course is on promoting the progression of competence within the Advanced Practice Nursing role.

NCC 686L. Clinical Practicum II: Advanced Pediatric Nursing - Acute Care. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to children, adolescents and their families. The focus of this course is to provide the student with opportunities to integrate in depth diagnostic and management skills to provide care for children, adolescents and their families. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: (NCC 621 [Min Grade: B] or NCC 621 [Min Grade: B]) and (NCC 685L [Min Grade: P] or NCC 685L [Min Grade: P])

NCC 687. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the student's knowledge base.

NCC 688L. Child/Adolescent Acute and Continuing Care Nurse Practitioner Practicum III. 2 Hours.
This course prepares the student in the Pediatric Nurse Practitioner role. The student develops the Pediatric NP role with patients/clients by providing pediatric health care services to clients (i.e. individuals, families, groups) emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences over two or three academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become more proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, including interdisciplinary collaboration, coach, educator, consultant roles. Prerequisite: NCC 622 and NCC 686L. Corequisite: NCC 623.
Prerequisites: (NCC 622 [Min Grade: B] and NCC 686L [Min Grade: P]) or (NCC 622 [Min Grade: B] and NCC 686L [Min Grade: P])

NCC 692L. Clinical Practicum III: Advanced Pediatric Nurse Practitioner - Acute Care. 4 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to pediatric patients and their families. The focus of this course is to evaluate progress toward achievement of professional competencies. The emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of pediatric patients and their families.
Prerequisites: (NCC 622 [Min Grade: B] or NCC 622 [Min Grade: B]) and (NCC 686L [Min Grade: P] or NCC 686L [Min Grade: P])

NCC 718L. Focus on Advanced Nursing Practice. 3 Hours.
The purpose of this course is the study of specialty track-specific topics. The focus of the course is to provide foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: NUR 612 [Min Grade: B] and NUR 613 [Min Grade: B] and NUR 614 [Min Grade: B](Can be taken Concurrently)

NCC 721. Advanced Pediatric Nursing I - Acute Care. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role Doctor of Nursing Practice prepared Advanced Practice Nurse. The emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to children with complex acute, critical and chronic illness across the entire pediatric age spectrum, from birth to young adulthood.
Prerequisites: (NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B]) and (NCC 618L [Min Grade: P] or NDP 618L [Min Grade: P])

NCC 722. Advanced Pediatric Nursing II - Acute Care. 4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness children with complex acute, critical and chronic illness across the entire pediatric age spectrum, from birth to young adulthood in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The focus of this course is on health promotion and disease prevention and management strategies from inter professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care of children with complex acute, critical and chronic illness across the entire pediatric age spectrum, from birth to young adulthood.
Prerequisites: NCC 721 [Min Grade: B] and NCC 785L [Min Grade: P]

NCC 723. Advanced Pediatric Nursing III - Acute Care. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course is on the utilization of complex models and systems of practice to deliver high quality evidence-based care as a Doctor of Nursing Practice prepared Advanced Practice Nurse to children with complex acute, critical and chronic illness across the entire pediatric age spectrum, from birth to young adulthood. The emphasis of the course is on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: NCC 722 [Min Grade: B] and NCC 786L [Min Grade: P]

NCC 785L. Practicum I: Pediatric Nurse Practitioner Acute Care. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to children with complex acute, critical and chronic illness across the entire pediatric age spectrum, from birth to young adulthood. The focus of this course is on the delivery of health care services to children with complex acute, critical and chronic illness across the entire pediatric age spectrum, from birth to young adulthood. The emphasis of this course is on promoting the progression of competence within the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse.
Prerequisites: (NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B]) and (NCC 618L [Min Grade: P] or NDP 618L [Min Grade: P])

NCC 786L. Practicum II: Pediatric Nurse Practitioner - Acute Care. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to children with complex acute, critical and chronic illness across the entire pediatric age spectrum, from birth to young adulthood. The focus of this course is to provide the student with opportunities to integrate in depth diagnostic, management, and leadership skills in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse, to provide care for children with complex acute, critical and chronic illness across the entire pediatric age spectrum, from birth to young adulthood. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: NCC 721 [Min Grade: B] and NCC 785L [Min Grade: P]

NCC 787. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the student's knowledge base.

NCC 792L. Practicum III: Pediatric Nurse Practitioner - Acute Care. 4 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to children with complex acute, critical and chronic illness across the entire pediatric age spectrum, from birth to young adulthood. The focus of this course is to evaluate progress toward achievement of competencies of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of children with complex acute, critical and chronic illness across the entire pediatric age spectrum, from birth to young adulthood.
Prerequisites: NCC 722 [Min Grade: B] and NCC 786L [Min Grade: P]

NCH-Nursing -Child Health Courses

NCH 760. Child Health Theories and Concepts. 3 Hours.
This course will focus on selected theories and concepts related to child health, child health nursing and child health nursing education. Emphasis will be on the theoretical underpinnings of the theories and concepts, major theorists associated with the theories and concepts, measurement strategies and instruments, and implications for research, education, and practice.

NCH 761. Emerging Issues in Child-Health Nursing. 3 Hours.
This course will focus on emerging issues in child health, child health nursing and child health nursing education. Emphasis is on current thought, state of the science and research related to topics which affect the health and lives of infants, children, and adolescents. Pivotal MCH, public health resources and the latest research and information will be used to guide discussion.

NCL-Nursing-Clinical Nur Lead Courses

NCL 618L. Focus on Advanced Nursing Practice Specialization. 2 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: (NUR 606 [Min Grade: B] or NUR 606 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B])

NCL 620. Systems in Population-based Care I. 4 Hours.
This course is designed to provide the student with opportunities to integrate in-depth knowledge of theoretical and practical concepts required to measure and improve healthcare quality, outcomes and safety. The student will focus on 5 roles required for the beginning Clinical Nurse Leader: Clinician, Member of Profession, Interdisciplinary Healthcare Team Manager, Outcomes Manager and Lifelong Learner. The course explores theories of change, complexity, horizontal and lateral leadership, microsystems and decision-making and their relationship to nursing and the health care system. The following elements are integrated into this course: critical thinking, research, scholarly writing, scientific integrity, ethics, cultural diversity, and social issues.

NCL 621. Systems in Population-based Care II. 3 Hours.
This course is designed to provide the student with opportunities to develop additional knowledge of theoretical and practical concepts required to measure and improve healthcare quality, outcomes and safety. The student will focus on the four additional roles required for the beginning Clinical Nurse Leader: Information Manager, Systems Analyst/ Risk Manager, Advocate, and Educator. The student will be expected to expand proficiency of previously learned Clinical Nurse Leader roles: Clinician, Member of a Profession, Team Manager, Outcomes Manager and Lifelong Learner. At the completion of this course the student will have explored all of the nine CNL roles as defined by the American Association of Colleges of Nursing's White Paper. The following elements are integrated into this course: critical thinking, research, scholarly writing, professional presentation, scientific integrity and ethics, cultural diversity, and social issues. Prerequisite: NCL 620 and NCL 685L. Corequisite: NCL 686L.
Prerequisites: NCL 620 [Min Grade: B] and NCL 685L [Min Grade: P] and (NUR 512 [Min Grade: B] or NUR 612 [Min Grade: B])

NCL 685L. CNL Practicum I. 2-3 Hours.
This course provides the student, at an introductory level, the opportunity to observe and apply in a clinical setting five of the nine CNL role functions: Clinician, Member of a Profession, Team Manager, Outcomes Manager and Lifelong Learner. The student will use these skills to focus on improving quality of care and patient safety. The student will be expected to utilize principals of critical thinking, evidence based research, scientific integrity and ethics, cultural diversity, and social issues to achieve above objectives. Prerequisite: NUR 600 and NUR 643. Corequisite: NCL 620.

NCL 686L. CNL Practicum II. 2 Hours.
Building on the preceding practicum, this course provides the student the opportunity to observe and apply in a clinical setting the remaining four of the CNL role functions. This course will focus on the student developing the CNL roles of information manager, systems analyst/ risk manager, advocate, and educator. The student will be expected to expand proficiency of the previous CNL roles of clinician, professional, interdisciplinary team manager, outcomes manager and lifelong learner. The student will use this knowledge and skill to evaluate, design and implement interventions to improve quality of care and patient safety. At the completion of this course the student will have explored all of the nine CNL roles as defined by the American Association of Colleges of Nursing's White Paper. Prerequisite: NCL 620 and NCL 685L. Corequisite: NCL 621.
Prerequisites: NCL 620 [Min Grade: B] and NCL 685L [Min Grade: B]

NCL 692L. CNL Capstone Practicum. 5 Hours.
This course provides the student the opportunity to integrate and apply in an intensive clinical rotation the nine CNL roles. The student will be expected to expand their proficiency in the roles of advocate, professional, team manager, information manager, systems analyst/risk manager, clinician, outcomes manager, educator and lifelong learner. The student will use these skills to design, implement, evaluate, and disseminate plans of care to improve quality and patient safety. At the completion of this course the student will demonstrate, at novice level, the nine CNL roles as defined by the American Association of Colleges of Nursing's White Paper.
Prerequisites: NCL 620 [Min Grade: B] and NCL 685L [Min Grade: P]

NCS-Nursing - Clinical Spec Courses

NCS 617. Phenomenon of Concern to Advanced Practice Nurses. 1 Hour.
This graduate specialty course focuses on phenomena of concern to advanced practice nurses and is designed to give the Clinical Nurse Specialist student the theoretical underpinnings of selected non-disease based causes of illness. Clinical/didactic information regarding symptoms, functional problems, and risk behaviors will be included to assist the student operationalize the role of the CNS in the patient/client sphere of influence, the nurse/nursing service sphere of influence, and the organization sphere of influence.

NCS 685L. Prac I: Clinical Specialization in Adult Health Nursing. 1,2 Hour.
This course is the first clinical practicum in the Clinical Nurse Specialist option. The student is provided the opportunity to develop the CNS role with a focus on the care of non-disease based etiologies of symptoms, functional problems, and risk behaviors among patients/ clients within a defined specialty. This practicum may include experiences in outpatient or inpatient settings. The student is expected to design evidence-based interventions for acute and/or chronic health problems commonly occurring within a defined specialty area. The following elements are integrated into this course: critical thinking, health promotion and disease prevention, research, ethics, cultural diversity, and social issues. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NUR 614L. Corequisite: NCA 621.
Prerequisites: (NUR 612 [Min Grade: B] or NUR 612 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) and (NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B])

NCS 686L. Practicum II: Clinical Specialization in Adult Health Nursing. 1-2 Hour.
This course further prepares the student in the Clinical Nurse Specialist role. The student continues to apply knowledge and current research findings to the management of selected acute and chronic health problems commonly occurring in the target population. While focusing on the care of acutely ill clients, the student develops the CNS role with nursing personnel through identifying and defining problems and opportunities; identifying and articulating factors contributing to resource management needs and outcomes; developing innovative solutions; and evaluating the effect of solutions. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NCA 621 and NCS 685L. Corequisite: NCA 622.
Prerequisites: (NCS 685L [Min Grade: P] or NCS 685L [Min Grade: P]) and (NCA 621 [Min Grade: B] or NCA 621 [Min Grade: B])

NCS 687L. Practicum III: Clinical Specialization in Adult Health Nursing. 1-2 Hour.
This course further prepares the student in the Clinical Nurse Specialist role. The student continues to apply knowledge and current research findings to the management of selected acute and chronic health problems commonly occurring in the target population. While focusing on the care of acutely ill clients, the student develops the CNS role with nursing personnel through identifying and defining problems and opportunities; identifying and articulating factors contributing to resource management needs and outcomes; developing innovative solutions; and evaluating the effect of solutions. An Objective Structured Patient Experience held during this course will determine if the student can progress into 6 hours of the final residency course, NCA 692L. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NCS 686L. Corequisite: NCA 623.
Prerequisites: (NCA 622 [Min Grade: B] or NCA 622 [Min Grade: B]) and (NCS 686L [Min Grade: P] or NCS 686L [Min Grade: P])

NCS 692L. Residency in Clinical Specialization. 2-4 Hours.
This course is the culminating experience for the student to practice in the role of the CNS. This course emphasizes the application of previously learned theories and knowledge from nursing and other disciplines. The student will implement the role of the CNS to manage the health care of adult clients, teaching, nurses and clients, discussing employment issues and evaluating products for use in clinical practice. Students arrange their own clinical sites with assistance/approval from clinical faculty. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Prerequisite: NCA 623 and NCA 687L.
Prerequisites: (NCA 623 [Min Grade: B] and NCS 687L [Min Grade: P]) or (NCA 623 [Min Grade: B] and NCS 687L [Min Grade: P])

NCV-Nursing - Cardiovascular Courses

NCV 631. Electrocardiography for Advanced Nursing Practice. 3 Hours.
Concepts presented in the course include the biophysical, psychological, developmental, and adaptive nature of the human being as it relates to the formation, function, and regulation of the cardiac electrical system. Concepts of cardiovascular adaptation to biophysical and psychosocial variables are emphasized. Explanations for electrophysiologic and electrocardiographic phenomena are offered, as are nursing and medical interventions for cardiac electrical abnormalities. Content focuses on the concepts of electrophysiology and electrocardiography, interpreting cardiac electrical abnormalities, and analyzing the various medical and nursing therapies for the electrical abnormalities and their applications to the practice of advanced nursing. May be taken as an elective.

NDP-Nursing - Dual Pediatric Courses

NDP 613. Dual Option Pediatric Pharmacology. 2 Hours.
This course is a supplement to the current pharmacology course, NUR 613, required of all MSN Advanced Practice students. The content is specific to infants, children and adolescents with their unique physiologic and metabolic characteristics. Pre or corequisite: NUR 613,.
Prerequisites: NUR 613 [Min Grade: B](Can be taken Concurrently) or NUR 613 [Min Grade: B](Can be taken Concurrently)

NDP 618L. Focus on Advanced Nursing Practice Specialization. 3 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: (NUR 606 [Min Grade: B] or NUR 606 [Min Grade: B] or NUR 729 [Min Grade: B] or NUR 737 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) and NUR 614 [Min Grade: B](Can be taken Concurrently)

NDP 621. Dual Option Pediatric I. 4-5 Hours.
This course provides a theoretical and practical base for students to diagnose and manage primary, acute, and continuing health problems of children and adolescents. Content includes management strategies from the domains of nursing, medicine, and pharmacological therapeutics, and emphasizes direct care to children, adolescents and their families. This course utilizes an on-line lecture/discussion and case study format to assist the student in the clinical assessment and decision-making to provide direct patient care to children, adolescents and their families within the scope of practice of primary and acute care child/adolescent nurse practitioners. The student is expected to apply the concepts and theories discussed in class to the care of children and adolescents during the clinical course taken in conjunction with this course. The following elements are integrated into this course: critical thinking, crisis management, health promotion and disease prevention, research, ethics, cultural diversity, cultural competence, and social issues.
Prerequisites: NUR 613 [Min Grade: B](Can be taken Concurrently) or NUR 613 [Min Grade: B](Can be taken Concurrently) and (NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B])

NDP 622. Dual Option Pediatric II. 3-5 Hours.
This course is designed to provide the students with opportunities to integrate in-depth knowledge of management of acute and continuing health care problems, family crises, case management, education and consultation roles and skills and procedures required by children, adolescents and their families who experience chronic, complex and life-threatening health problems. Students will have the opportunity to develop strategies to present information about acute and continuing health care problems to peers and colleagues. The following elements are incorporated into the course: critical thinking, crisis management, health promotion and disease prevention, scientific integrity and ethics, human diversity, cultural competence, social issues and professional role development.
Prerequisites: (NDP 621 [Min Grade: B] or NDP 621 [Min Grade: B]) and (NDP 685L [Min Grade: P] or NDP 685L [Min Grade: P])

NDP 623. Dual Option Pediatric III. 4-5 Hours.
This course provides a theoretical and practical base for students to diagnose and manage chronic health problems of children and adolescents. Additionally, students will be provided with opportunities to integrate in-depth knowledge of management of chronic health care problems, family crises, case management, education and consultation roles and skills and procedures required by children, adolescents and their families who experience chronic, complex health problems. Content includes management strategies from the domains of nursing, medicine, and pharmacological therapeutics, and emphasizes direct care to children, adolescents and their families. This course utilizes an on-line lecture/discussion and case study format to assist the student in the clinical assessment and decision-making to provide direct patient care to children, adolescents and their families within the scope of practice of primary and acute care pediatric nurse practitioners. Students will have the opportunity to develop strategies to present information about chronic health care problems to peers and colleagues. The student is expected to apply the concepts and theories discussed in class to the care of children and adolescents during the clinical course taken in conjunction with this course. The following elements are integrated into this course: critical thinking, crisis management, health promotion and disease prevention, research, ethics, cultural diversity, cultural competence, and social issues.
Prerequisites: (NDP 622 [Min Grade: B] or NDP 622 [Min Grade: B]) and (NDP 686L [Min Grade: P] or NDP 686L [Min Grade: P])

NDP 624. Dual Option Pediatric IV. 3-5 Hours.
This course provides a theoretical and practical base for students to diagnose and manage critical illnesses in children and adolescents. Additionally, students will be provided with opportunities to integrate in-depth knowledge of management of critical health care problems, family crises, case management, education and consultation roles and skills and procedures required by children, adolescents and their families who experience critical and complex health problems. Content includes management strategies from the domains of nursing, medicine, and pharmacological therapeutics, and emphasizes direct care to children, adolescents and their families. This course utilizes an on-line lecture/discussion and case study format to assist the student in the clinical assessment and decision-making to provide direct patient care to children, adolescents and their families within the scope of practice of primary and acute care pediatric nurse practitioners. Students will have the opportunity to develop strategies to present information about critical health care problems to peers and colleagues. The student is expected to apply the concepts and theories discussed in class to the care of children and adolescents during the clinical course taken in conjunction with tthis course. The following elements are integrated into this course: critical thinking, crisis management, health promotion and disease prevention, research, ethics, cultural diversity, cultural competence, and social issues.
Prerequisites: NDP 623 [Min Grade: B] and NDP 687L [Min Grade: P]

NDP 625. Advanced Dual Option Pediatric Nurse Practitioner. 2 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course is on the utilization of complex models and systems of practice to deliver high quality evidence-based care to primary and acute care pediatric patients and their families. The emphasis of the course is on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: NCC 622 [Min Grade: C] and NCC 686L [Min Grade: C]

NDP 685L. Dual Option Pediatric Nurse Practitioner Practicum I. 3 Hours.
This course prepares the student in the Dual Option Pediatric Nurse Practitioner role. The student develops the NP role with patients/clients by providing health care to individual children, adolescents, families, and groups at any point of the continuum of health statuses in acute and continuing care settings. The student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include acute and chronic health problems and human responses to disease in children, adolescents and their families. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, cultural sensitivity and social issues. The advanced practice role emphasis in this course provides experiences for the developing Dual Option Pediatric Nurse Practitioner including interdisciplinary collaboration, case management, educator, and consultant roles.

NDP 686L. Dual Option Pediatric Nurse Practitioner Practicum II. 3 Hours.
This course prepares the student in the Pediatric Nurse Practitioner role. The student develops the Pediatric NP role with patients/clients by providing pediatric health care services to clients (Le. (i.e. individuals, families, groups) emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences over two or three academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become more proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, including interdisciplinary collaboration, coach, educator, consultant roles.
Prerequisites: (NDP 621 [Min Grade: B] or NDP 621 [Min Grade: B]) and (NDP 685L [Min Grade: P] or NDP 685L [Min Grade: P])

NDP 687L. Dual Option Pediatric Nurse Practitioner Practicum III. 3 Hours.
This course prepares the student in the Pediatric Nurse Practitioner role. The student develops the Pediatric NP role with patients/clients by providing pediatric health care services to clients (i.e. individuals, families, groups) emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences over two or three academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become more proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, including interdisciplinary collaboration, coach, educator, consultant roles.
Prerequisites: (NDP 622 [Min Grade: B] or NDP 622 [Min Grade: B]) and (NDP 686L [Min Grade: P] or NDP 686L [Min Grade: P])

NDP 688L. Dual Option Pediatric Nurse Practitioner Practicum III. 3 Hours.
NDP 688L prepares the student in the Dual Option Pediatric Nurse Practitioner role. The student develops the NP role with patients/clients by providing health care to individual children, adolescents, families, and groups at any point of the continuum of hearlth statuses in acute and continuing care settings. The student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include acute and chronic health problems and human responses to disease in children, adolescents and their families. The following elements are integrated into the course: critical thinking, professional presentations, research ulitization, scientific integrity and ethics, human diversity, cultural sensitivity and social issues. The advanced practice role emphasis in this course provides experiences for the developing Dual Option Pediatric Nurse Practitioner including interdisciplinary collaboration, case management, educator, and consultant roles.
Prerequisites: (NDP 621 [Min Grade: B] or NDP 621 [Min Grade: B]) and (NDP 685L [Min Grade: P] or NDP 685L [Min Grade: P]) and (NDP 622 [Min Grade: B] or NDP 622 [Min Grade: B]) and (NDP 686L [Min Grade: P] or NDP 686L [Min Grade: P]) and (NDP 623 [Min Grade: B] or NDP 623 [Min Grade: B]) and (NDP 687L [Min Grade: P] or NDP 687L [Min Grade: P])

NDP 692L. Residency: Dual Option Pediatric Nurse Practitioner. 4 Hours.
This course prepares the student in the Pediatric Nurse Practitioner role to be a beginning expert in the diagnosis and management of pediatric patient problems. In the residency, the student is expected to continue to grow toward becoming an independent practitioner, specializing in the care of children. The student further develops the pediatric NP role with patients/clients by providing pediatric health care services to clients (i.e. individuals, families, groups) emphasizing the promotion of health and the prevention of disease. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human response to disease.
Prerequisites: (NCC 622 [Min Grade: B] or NCC 622 [Min Grade: B]) and (NCC 686L [Min Grade: P] or NCC 686L [Min Grade: P])

NFA - RN First Assist Courses

NFA 620. Surgical Techniques. 3 Hours.
This course will focus on the expanded functions unique to the RNFA role during operative and invasive procedures. The course includes the recommended content of the Core Curriculum for the RN First Assist and is designed to develop the beginning knowledge and skills needed for safe RNFA practice. Surgical practice and techniques such as sterile technique, positioning and draping, using instruments and medical devices, providing exposure, handling and cutting tissue, providing hemostasis, and suturing will be emphasized in a (hands on) laboratory experience. The course will be taught in a blended distance accessible format and on campus 4-5 day intensive session in an animal surgical laboratory. This format will enable each student to apply surgical principles and techniques to a swine surgical model. Students without operating room experience will be required to take the 4 credit hours (5 day intensive) and students with operating room experience will take 3 credit hours (4 day intensive). Admission to the ACNP/RNFA graduate program or RNFA post masters option required.

NFA 621. Advanced Perioperative Nursing I. 3 Hours.
This course will focus on the expanded functions unique to the RNFA role during operative and invasive procedures. The course includes the recommended content of the Core Curriculum for the RN First Assist and is designed to develop the beginning knowledge and skills needed for safe RNFA practice. The course will emphasize surgical and medical devices, providing exposure, handling, and cutting tissue, providing hemostasis, and suturing will be emphasized in a "hands-on" swine laboratory experience. The course will be taught in a blended distance accessible format and on-campus 1-day intensive session in the Nursing Competency Labs. The purpose of the course is to enable each student to apply surgical principles and techniques.
Prerequisites: NFA 620 [Min Grade: B]

NFA 622. Advanced Perioperative Nursing I: Practicum. 1-3 Hour.
This course prepares the advanced perioperative student to function in the expanded role of first assistant to the surgeon. In this practicum, the student is expected to continue to grow toward becoming a competent advanced perioperative nurse, specializing in problems requiring surgical interventions and management and the full scope of RNFA practice. Further, the student continues to apply, knowledge and current research findings to the management of actual and potential health problems, which include common surgical diseases and human responses to disease. The following elements are integrated into the course: critical thinking, research utilization, scientific integrity and ethics, human diversity, and awareness of social and professional issues. The advanced perioperative practice role emphasis in this course continues the trajectory of the RNFA as a beginning expert and includes role components such as interdisciplinary collaborator, educator, and consultant. Prerequisite: NFA 620 and NFA 621.
Prerequisites: (NFA 620 [Min Grade: B] and NFA 621 [Min Grade: B]) or (NFA 620 [Min Grade: B] and NFA 621 [Min Grade: B])

NFH-Nursing - Family Courses

NFH 618L. Focus on Advanced Nursing Practice Specialization. 3 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: (NUR 606 [Min Grade: B] or NUR 606 [Min Grade: B] or NUR 729 [Min Grade: B] or NUR 729 [Min Grade: B] or NUR 737 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) and NUR 614 [Min Grade: B](Can be taken Concurrently)

NFH 621. Advanced Family Nursing I. 3-5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role of the Advanced Practice Nurse. The emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to pediatric, adult and elderly populations.
Prerequisites: (NUR 612 [Min Grade: B] or NUR 612 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) and (NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B]) and (NUR 610 [Min Grade: B] or NUR 610 [Min Grade: B] or NUR 735 [Min Grade: B] or NUR 735 [Min Grade: B])

NFH 622. Family Nurse Practitioner II. 3-4 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to pediatric, adult and elderly populations. The focus of this course is to provide the student with opportunities to integrate in depth diagnostic and management skills to provide care for pediatric, elderly and adult populations. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: (NFH 621 [Min Grade: B] or NFH 621 [Min Grade: B]) and (NFH 685L [Min Grade: P] or NFH 685L [Min Grade: P])

NFH 623. Family Nurse Practitioner III. 5 Hours.
This course is designed to provide the student with opportunities to integrate in-depth knowledge of health assessment and management skills to provide care for clients with commonly occuring chronic and complex health problems with diverse cultures over the life span. Students will also have the opportunity to develop strategies to market the nurse practitioner role, to creat a specific practice position and to explore strategies to market their role in family health care. The following elements are integrated into the course: critical thinking, health promotion and disease prevention, scientific integrity and ethics, human diversity and social issues and professional role development.
Prerequisites: NFH 622 [Min Grade: B]

NFH 623L. Family Nurse Practitioner III. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course is on the utilization of complex models and systems of practice to deliver high quality evidence-based care to pediatric, adult, and elderly populations. The emphasis of the course is on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: (NFH 622 [Min Grade: B] or NFH 622 [Min Grade: B]) and (NFH 686L [Min Grade: P] or NFH 686L [Min Grade: P])

NFH 685L. Practicum I: Family Nurse Practitioner. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to pediatric, adult and elderly populations. The focus of this course is on the delivery of health care services to pediatric, adult and elderly populations. The emphasis of this course is on promoting the progression of competence within the Advanced Practice Nursing role.
Prerequisites: (NUR 612 [Min Grade: B] or NUR 612 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) and (NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B])

NFH 686L. Practicum II: Family Nurse Practitioner. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to pediatric, adult and elderly populations. The focus of this course is to provide the student with opportunities to integrate in depth diagnostic and management skills to provide care for pediatric, adult and elderly populations. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: (NFH 621 [Min Grade: B] or NFH 621 [Min Grade: B]) and (NFH 685L [Min Grade: P] or NFH 685L [Min Grade: P])

NFH 687. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the students' knowledge base.
Prerequisites: NFH 686 [Min Grade: P]

NFH 692L. Practicum III: Family Nurse Practitioner. 3-6 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to pediatric, adult and elderly populations. The focus of this course is to evaluate progress toward achievement of professional competencies. The emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of pediatric, adult and elderly populations.
Prerequisites: (NFH 622 [Min Grade: B] or NFH 622 [Min Grade: B]) and (NFH 686L [Min Grade: P] or NFH 686L [Min Grade: P])

NFH 718L. Focus on Advanced Nursing Practice. 3 Hours.
The purpose of this course is the study of specialty track-specific topics. The focus of the course is to provide foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: NUR 612 [Min Grade: B] and NUR 613 [Min Grade: B]

NFH 721. Advanced Family Nursing I. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of the course is to prepare the student to implement the role Doctor of Nursing Practice prepared Advanced Practice Nurse. The emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to pediatric adult and elderly populations.
Prerequisites: (NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B]) and NFH 618L [Min Grade: P]

NFH 722. Advanced Family Nursing II. 4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness for pediatric, adult and elderly populations in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The focus of this course is on the health promotion and disease prevention and the management of strategies form inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care of pediatric, adult and elderly populations.
Prerequisites: NFH 721 [Min Grade: B] and NFH 618L [Min Grade: P]

NFH 723. Advanced Family Nursing III. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course in on the utilization of complex models and systems of practice to deliver high quality evidence-based care as a Doctor of Nursing Practice prepared Advanced Practice Nurse to pediatric, adult and elderly populations. The emphasis of the course in on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: NFH 722 [Min Grade: B] and NFH 786L [Min Grade: P]

NFH 785L. Practicum I: Family Nurse Practitioner. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to pediatric, adult and elderly populations. The focus of this course is on the delivery of health care services to pediatric, adult, and elderly populations. The emphasis of this course is on promoting the progression of competence within the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse.
Prerequisites: NFH 618L [Min Grade: P]

NFH 786L. Practicum II: Family Nurse Practitioner. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to pediatric, adult, and elderly populations. The focus of this course is to provide the student with opportunities to integrate in-depth diagnostic, management, and leadership skills in the role of the Doctor of Nursing Practice prepared Advanced practice Nurse to provide care for pediatric, adult, and elderly populations. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: NFH 721 [Min Grade: B] and NFH 785L [Min Grade: P]

NFH 787. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the students' knowledge base.

NFH 792L. Practicum III: Family Nurse Practitioner. 4 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to pediatric, adult, and elderly populations. The focus of this course is to evaluate progress toward achievement of competencies of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of pediatric, adult, and elderly populations.
Prerequisites: NFH 722 [Min Grade: B] and NFH 786L [Min Grade: P]

NGN-Nursing - Gerontological Courses

NGN 630. Advanced Practice Gerontology Nursing. 2 Hours.
This course is desigend to provide students in all advanced practice nursing tracks with the ability to integrate knowledge of gerontology and geriatrics with other specialy knowledge concerning the management of health care of adults. The emphasis in the course is on providing students with the background to apply this knowledge with elders and their families.

NGN 631. Gerontology and Geriatrics for Advanced Nursing Practice. 3 Hours.
This course is designed to provide students with the opportunity to integrate knowledge of gerontology and geriatrics with previously acquired knowledge concerning the management of health care of adults. It is the required support course for students in the gerontological nurse practitioner option and may be taken as an elective by students in other options. In this course students acquire knowledge of gerontology and geriatrics that is relevant to the nursing and medical management of health care of elders. This knowledge is applied in the required clinical course.

NGN 632. Chronic Health Conditions for Advanced Nursing Practice. 3 Hours.
This is a required support course for students in the gerontological nurse practitioner option, and may be taken as an elective by students in other options. In this course students acquire knowledge of a variety of clinical topics that are relevant to the nursing and medical management of health care of persons with complex chronic disorders such as urinary/fecal incontinence, chronic wounds and psychiatric disorders. The course is designed to provide students with the opportunity to integrate knowledge of selected chronic conditions with previously acquired knowledge concerning the management of health care of patients.

NGN 685L. Practicum I: Gerontological Nurse Practitioner. 2 Hours.
This is the first of two gerontological practica courses for the dual adult/Gerontological Nurse Practitioner specialty. In selected clinical settings students are expected to integrate the knowledge and competencies gained from foundation courses and didactic content to further develop the Gerontological Nurse Practitioner role. This course allows the student to develop the role by providing health care services to individuals, families, and groups, while emphasizing the promotion of health and prevention of disease. The student addresses the management of actual and potential health problems including common diseases and human responses to diseases. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, and social issues. Prerequisite: NUR 614L. Corequisite: NAH 621.
Prerequisites: NUR 614L [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B]

NGN 686L. Practicum II: Gerontological Nurse Practitioner. 2 Hours.
This is the second of two gerontological practica courses for the dual adult/Gerontological Nurse Practitioner specialty. In selected clinical settings students are expected to integrate the knowledge and competencies gained from foundation courses and didactic content to further develop the Gerontological Nurse Practitioner role. This course allows the student to develop the role by providing health care services to individuals, families, and groups, while emphasizing the promotion of health and prevention of disease. It is anticipated that the student will be increasingly independent and skilled as the clinical experience progresses, allowing the student to contribute more toward the management of health problems. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity, and social issues. Prerequisite: NAH 621 and NGN 685L. Corequisite: NAH 622.
Prerequisites: (NAH 621 [Min Grade: B] and NAH 658L [Min Grade: P]) or (NAH 621 [Min Grade: B] and NAH 621 [Min Grade: P])

NGN 692L. Residency: Gerontological Nurse Practitioner. 1-4 Hour.
This course is the third of three clinical practicum courses and is designated as the culminating practical experience for Gerontology nurse practitioner students. This course encourages the student to apply knowledge and theories from the core courses as well as previous clinical and clinical support courses. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NGN 686L.
Prerequisites: NAH 686L [Min Grade: P] or NAH 686L [Min Grade: P]

NGN 731. Advanced Practice Gerontological Nursing I. 3 Hours.
This course is designed to provide DNP students who are already adult, adult acute, and/or family nurse practitioners and who are delivering care to a majority of gerontological patients, with an advanced theoretical and empirical knowledge of aging. This level of specialized gerontological nursing knowledge is beyond what would be obtained in an acute, adult, or family nurse practitioner program. The content in NGN 731Q and NGN 732Q satisfies the ANCC didactic requirements for a secondary certification as a gerontological nurse practitioner under the alternative eligibility requirements. This course and NGN 732Q should be considered for students interesting in a secondary licensure and is not intended for initial licensure as an advanced practice gerontological nurse. Documentation of clinical hours required by the ANCC is incumbent upon the student, not the UASON. Questions concerning the alternative eligibility requirements may be addressed by course faculty or by the ANCC registrar.

NGN 732. Advanced Practice Gerontological Nursing II. 3 Hours.
This course is designed to provide DNP students who are already adult, adult acute, and/or family nurse practitioners and who are delivering care to a majority of gerontological patients, with an advanced theoretical and empirical knowledge of aging. This level of specialized gerontological nursing knowledge is beyond what would be obtained in an acute, adult, or family nurse practitioner program. The content in NGN 731Q and NGN 732Q satisfies the ANCC didactic requirements for a secondary certification as a gerontological nurse practitioner under the alternative eligibility requirements. This course and NGN 731Q should be considered for students interesting in a secondary licensure and is not intended for initial licensure as an advanced practice gerontological nurse. Documentation of clinical hours required by the ANCC is incumbent upon the student, not the UASON. Questions concerning the alternative eligibility requirements may be addressed by course faculty or by the ANCC registrar.

NHSA-Nursing and Health Admin Courses

NHSA 616. Nursing Financial Management. 4 Hours.
Nurse leaders play an important role in managing the financial responsibilities for providing high quality care. This course explores health care economics and health care policy as it applies to access, costs, and quality, current and future mechanisms for financing health care services, and organization and unit level budgeting principles. Content will include creating, monitoring, and analyzing a budget, interpreting financial information, and capital budgeting. Corequisite: NHSA 617L.

NHSA 617L. Nursing Financial Management Practicum. 2-3 Hours.
This course provides a practical base for students to apply financial concepts in a health care organization. Students will work with healthcare administrators to create, monitor, and/or analyze budgets, examine revenue cycle for opportunities for improvement, and develop a business case for a new product or service.

NHSA 618. Human Resource Management. 3 Hours.
This course provides a theoretical basis for students to learn and apply human resources and organizational concepts, theories, and behaviors. The course will facilitate the individual growth and development of the nurse leader. Content includes human resource management issues; recruitment and retention; staff development; roles clarification; leadership development and succession planning; teamwork and collaborative practice; conflict management; performance management; cultural competence and the work environment; personnel policies, standards, and laws; and decision making and governance models. Students will begin developing a professional portfolio. Successful completion of field experience is required.

NHSA 620. Nursing and Health Systems Administration I. 3 Hours.
This course provides a theoretical base for students to develop the role of nursing and health systems administrator at the unit level. Emphasis is placed on the development of the knowledge and skills necessary for implementing the management role. Students will develop specific administrative competencies to include the ability to: understand self and others, communicate effectively, develop subordinates, manage conflict, monitor personal and individual performance, manage projects, delegate effectively, manage time and stress, foster a productive work environment, live with change, and build and maintain a power base. Content builds on the theoretical foundations of leadership, organizational behavior, and capital management applied to the structure of nursing and health organizations, patient care delivery and classification systems, staffing, budgeting, quality standards and improvement, risk management, leadership development, strategic planning, and change management. The following elements are integrated into this course: critical thinking, research, scholarly writing, professional presentation, scientific integrity and ethics, cultural diversity, and social issues. The role emphasis of this course is that of beginning nurse manager. Prereq: Admission to the Nursing and Health Systems Administration option.
Prerequisites: NUR 601 [Min Grade: B] and (MBA 609 [Min Grade: C] or HCO 615 [Min Grade: C]) and (MBA 632 [Min Grade: C] or HA 631 [Min Grade: C]) and NUR 602 [Min Grade: C]

NHSA 621. Nursing and Health Systems Administration II. 2,4 Hours.
This course provides a theoretical and experiential base for students to develop and implement the role of nursing and health systems administrator at the division/ department level. Emphasis is placed on the synthesis of knowledge and skills from the disciplines of nursing and business management that is necessary to apply when assuming the middle management role. Students will develop specific administrative competencies to include the ability to manage collective performance, design and organize projects, negotiate agreement and commitment, and create change. Content includes analysis of administrative roles and functions, strategies for coordination of quality care within and across departments and systems, strategies for service as an expert resource, business planning, cost and productivity, redesigning practice to achieve goals, models of practice and service delivery, utilization of consultants, managing product/service lines, and utilization of research for improving nursing processes and patient care outcomes. The following elements are integrated into this course: critical thinking, research, scholarly writing, professional presentation, scientific integrity and ethics, cultural diversity, and social issues. The role emphasis of this course is that of mid-level manager. Prerequisite: NHSA 620. Corequisite: NHSA 685L.
Prerequisites: NHSA 620 [Min Grade: B]

NHSA 622. Nursing and Health Systems Administration III. 2 Hours.
This course continues to provide a theoretical and experiential base for students to develop and implement the role of nursing and health systems administrator at the executive level. Through seminar discussion and with an executive level preceptor, emphasis is placed on the application, synthesis, and integration of knowledge and skills necessary for effective and efficient management of human and material resources, while incorporating the ethical, social, legal, financial, and economic aspects of health care delivery, health policy, and regulatory requirements for both staff and the organization. Students will develop specific administrative competencies to include the ability to manage organizational performance, manage across functions, present ideas, think creatively, and develop a vision, mission, strategic plan, and set goals. Content includes health care regulation and policy, practice plans and financing, internal and external environmental influences on nursing and health care systems, information system development and management, quality improvement, and managed care systems. The following elements are integrated into this course: critical thinking, research, scholarly writing, professional presentation, scientific integrity and ethics, cultural diversity, and social issues. The role emphasis of this course is that of chief nurse executive. Prerequisite: NHSA 621 and NHSA 685L. Corequisite: NHSA 686L.
Prerequisites: NHSA 621 [Min Grade: B]

NHSA 630. Health Services Marketing Management. 3 Hours.
The redesign of healthcare organizations has mandated larger spans of control for nurse managers with expertise and leadership skills in organizational, human resource, and financial management. The need for the integration of clinical skills with business know-how has been fueled by a more diverse work force with direct responsibility for non-nursing staff, an increased emphasis on customer service and risk management, and the ability to design and implement care delivery models that extend beyond the walls of the organization into the community and its stakeholders. Health systems across the country (and internationally), including home health agencies, managed care entities, public and private sector hospitals, long-term and ambulatory care facilities, and insurance companies, are searching for advanced level nurses for management and executive level positions.

NHSA 631. Advanced Quality and Patient Safety. 1-4 Hour.
This course examines current issues in quality improvement and patient safety activities. The course includes a review of past and current efforts, tools, and theories of quality assessment, assurance, utilization management, and measuring and improving outcome. In addition, the course looks at new initiatives to improve quality and safety through regulation, reporting and financial incentives.

NHSA 632. Nursing and Health Systems Administration I. 2-4 Hours.
This course provides a theoretical base for students to develop the role of nursing and health systems administrator. Emphasis is placed on development of knowledge and skills necessary for implementing the management role. Students will develop specific administrative competencies to include the ability to: understand self and others; communicate effectively, develop subordinates, manage conflict, monitor personal, individual, and team performance, manage projects, delegate effectively, manage time and stress, foster a productive work environment, live with change, and build and maintain a power base. Content builds on the theoretical foundations of leadership, organizational behavior, financial management, patient care delivery, quality standards and improvement, risk management, leadership development, and change management. The following elements are integrated into this course: critical thinking, research, scholarly writing, professional presentation, scientific integrity and ethics, cultural diversity, and social issues. The role emphasis of this course is for entry and mid-level nurse leaders. Prerequisite: Admission to the Nursing and Health Systems Administration option.
Prerequisites: NHSA 616 [Min Grade: B] and NHSA 617L [Min Grade: P] and NHSA 618 [Min Grade: B] and NHSA 631 [Min Grade: B] and NHSA 681L [Min Grade: P]

NHSA 633. Nursing and Health Systems Administration II. 4 Hours.
This course offers a theoretical base for students to develop and implement the role of nursing and health systems administrator at the service line/division or higher level. Emphasis is on the synthesis of knowledge and skills from multiple disciplines including nursing and business necessary when assuming a mid-level to senior level leadership role. A primary focus of this course is to develop the nurse leader as an expert to influence patient care, systems and community outcomes in a variety of settings such as ambulatory clinics, long-term care, acute care, community, managed care and policy-making. Content includes strategic management, health care policy and regulation, internal and external environmental assessments, disaster preparedness, and organizational and professional accountability. The following elements are integrated into this course: critical thinking, research, scholarly writing, professional presentation, scientific integrity and ethics, cultural diversity, and social issues. The role emphasis of this course is mid-level to senior level leadership roles.
Prerequisites: NHSA 632 [Min Grade: B] and NHSA 682L [Min Grade: P]

NHSA 640. Economics for Nursing. 3 Hours.
Nurses care for people and caring is the central concept of modern nursing. Yet caring takes many forms, including caring about the economics of services provided. Changes in payment systems, organizational structure and the U.S.healthcare market have led to new interests in the economics of care delivery. Nurses play a major role in this care delivery, as clinicians, administrators and scholars. Topics for the completely on-line course include a basic introduction to economics as it applies to nursing, the nursing labor and service markets and critical professional economic issues facing nursing today.

NHSA 681L. Advanced Quality and Patient Safety Practicum. 2-3 Hours.
This course provides an experiential base for students to develop and implement the role of nursing and health systems quality and outcomes manager within a healthcare organization. Students will analyze outcomes measurement and quality improvement in a health care setting from a strategic perspective and engage, as leaders and participants, in efforts to improve the quality of health services.

NHSA 682L. Nursing and Health Systems Administration I Practicum. 2-4 Hours.
This course is the third of four required practicum courses for the nursing and health systems administration student. Students in this course will synthesize theoretical concepts for administration practice and apply knowledge and skills obtained in masters core courses and prerequisite support courses to meet the objectives of the course. Students will arrange their own clinical site(s) with assistance/approval from clinical faculty.
Prerequisites: NHSA 616 [Min Grade: B] and NHSA 617L [Min Grade: P] and NHSA 618 [Min Grade: B] and NHSA 631 [Min Grade: B] and NHSA 681L [Min Grade: P]

NHSA 683L. Nursing and Health Systems Administration II Practicum. 2 Hours.
This course is the last of four practicum courses for the nursing and health-systems administration student. Students in this course will synthesize theoretical concepts for administration practice and apply knowledge and skills obtained in masters core courses and prerequisite support courses to meet the objectives of the course. Emphasis is placed on the synthesis of knowledge and skills from the disciplines of nursing and business management that is necessary to apply when assuming a mid- or senior level management/leadership role. Students will arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NHSA 632 and NHSA 682L. Corequisite: NHSA 633.
Prerequisites: NHSA 632 [Min Grade: B] and NHSA 682L [Min Grade: P]

NHSA 685L. Nursing and Health Systems Administration Practicum I. 1-2 Hour.
This course is the first of two required application courses for the nursing and health-systems administration student. Students in this course will synthesize theoretical concepts for administration practice and apply knowledge and skills obtained in masters core courses and prerequisite support courses to meet the objectives of the course. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NHSA 620. Corequisite: NHSA 621.
Prerequisites: NHSA 620 [Min Grade: B]

NHSA 686L. Nursing and Health Systems Administration/Quality Management Practicum II. 4 Hours.
Nursing and Health Systems Administration/Quality and Outcomes Management in Health Systems: This course provides an experimental base for students to develop and implement the role of nursing and health systems administrator and quality and outcomes manager at the executive level. Emphasis is placed on the synthesis of knowledge and skills from the disciplines of nursing and business management that is necessary to apply when assuming a management and leadership role. Students will analyze outcomes measurement and quality improvement in a health care setting from a strategic perspective and engage, as leaders and participants, in efforts to improve the quality of health services. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NHSA 621 and NHSA 685L. Corequisite: NHSA 622.
Prerequisites: NHSA 621 [Min Grade: B] and NHSA 685L [Min Grade: P]

NHSA 687. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the student's knowledge base.

NHSL - Nursing Hlth Sys Leader Courses

NHSL 604. Developing the Advanced Nurse Leader. 3 Hours.
The purpose of this course is to provide core content in leadership theories and models for MSN students in the Health Systems Leadership division. The focus of this course is on major theoretical leadership perspectives and change management providing rigorous evidence for systems' practice application and innovation. Emphasis is on specialty role competencies integrating leadership skills for emerging leaders are included through professional development experiences. This course will include a range of practical skills and special topics on major trends in contemporary leadership, including communication, relationship building, negotiation and conflict, change management, ethical and moral leadership, and team science.

NHSL 606. Evidence-Based Translation and Management. 3 Hours.
In this course, the graduate student nurse in the leadership core will learn about and apply the activities of retrieval, rating, grading, synthesis, and translation of evidence to support change to improve quality, safety, efficiency, and outcomes for systems and population. The course stresses the interdependence and fluidity of various approaches to evidence-based practice with an emphasis on developing your skills in scientific inquiry, critical appraisal, and translation. You will examine the use of evidence in the nurse leader practice and use the knowledge and skills gained in this course to apply to future scholarly projects.
Prerequisites: NHSL 610 [Min Grade: B] and NHSL 604 [Min Grade: B]

NHSL 610. Health Care Systems for Advanced Leaders. 3 Hours.
The purpose of this course is to provide graduate nurse leader students with the fundamental knowledge and skills necessary to assume leadership, fiscal, and system responsibilities for providing high-quality services in healthcare organizations. This course focuses on healthcare systems, organizational structures, economics concepts, fiscal management, health policy, and delivery of population health services across the continuum of care. Emphasis is on the integration and use of system concepts, organization theories, fiscal responsibilities, resource management, and legal and ethical issues driving strategic decision-making in healthcare organizations.

NMD - Nursing - Diabetes Mnmgt Courses

NMD 621. Advanced Management of Diabetes I. 3 Hours.
A variety of management strategies will be presented from multiple healthcare disciplines. The perspectives of the multi-disciplinary team in assisting persons to achieve self-care goals is an important theme throughout this course as are the current controversies, issues, and research findings underlying present approaches to treatment and patient/family education. Topics presented are based on the curriculum blueprint of the American Diabetes Educators Program recommendations for the ANCC/AADE Advanced Diabetes Management certification examination for clinical nurse specialist and/or nurse practitioners. The topics addressed in this course include: recognition of early signs of diabetes mellitus, self glucose monitoring, diabetes among: minorities, and those residing in rural settings. Pre-req: NUR 600, NUR 614, NCA 621 and NCA 685L or equivalent or ANCC certifcation as a Nurse Practitioner.

NMD 622. Advanced Management of Diabetes II. 3 Hours.
This online course is the second in a program of study focusing on advanced diabetes management across the lifespan. Two didactic and three clinical courses are offered that will provide a multi-disciplinary framework for the identification of those at risk for or who already possess the metabolic syndrome, prediabetes, frank type 1 or 2 diabetes mellitus and/or the associated complications. A variety of management strategies will be presented from multiple healthcare disciplines. The perspectives of the multi-disciplinary team in assisting persons to achieve self-care goals is an important theme throughout this course as are the current controversies, issues, and research findings underlying present approaches to treatment and patient/family education. Topics presented are based on the curriculum blueprint of the American Diabetes Educators Program recommendations for the ANCC/AADE Advanced Diabetes Management certification examination for clinical nurse specialist and/or nurse practitioners. Topics presented will be based on the curriculum of the American Diabetes Educators Program recommendations for the Certified Diabetes Educator. These topics include: family planning, gestational diabetes, poly cystic ovarian syndrome (PCOS), orthopedic sequelae of diabetes, transplantation, glucose monitoring, insulin pump and other advanced diabetes technologies, diabetes in: rural minorities, elderly, children; diabetes in persons with disabilities, insurance issues, cultural issues, economic issues, mood disorders, eating disorders, hypoglycemia, pain management, foot care, risks of ESRD, hypertension, obesity, dental concerns and provider reimbursement issues regarding diabetes education services.Prerequisite: NMD 621 and NMD 685L or ANCC certification as a nurse practitioner.
Prerequisites: NMD 621 [Min Grade: B] or NMD 621 [Min Grade: B]

NMD 685L. Practicum I: Advanced Management of Diabetes. 3 Hours.
NMD 685L allows the student to begin the development of the Advanced Diabetes Management role by providing health care services to clients across the lifespan (i.e., individuals, families, groups) in a variety of settings and emphasizing the promotion of health and the prevention of disease. Further, the student applies knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and awareness of social and professional issues. The advanced practice role emphasis in this course begins the trajectory of the NP experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, teacher, manager, researcher, and consultant. .Students arrange their own clinical sites with assistance/ approval from clinical faculty. Corequisite: NMD 621.

NNE-Nursing - Neonatal Courses

NNE 613. Neonatal Pharmacology and Therapeutics. 3 Hours.
This course focuses on the analysis and utilization of principles of pharmacology and pharmacokinetics for the purpose of planning, implementing, and evaluating theraputic pharmacological interventions within the specified population. The unique characteristics of the neonatal population, related to therapeutic needs, as well as drug absorption, metabolism and excretion are defined.

NNE 614L. Assessment and Diagnostic Reasoning for Advanced Nursing Practice. 4 Hours.
This course is designed to provide students with an advanced level of skill and knowledge in critical thinking, procedures and skills, and diagnostic reasoning for conducting health assessments and planning care for wholistic, adaptive human beings. The following elements are integrated into the course: professional presentations, critical thinking, scientific integrity and ethics, human diversity and social issues.Pre or Corequisite: NUR 612.
Prerequisites: NUR 612 [Min Grade: B](Can be taken Concurrently) or NUR 612 [Min Grade: B](Can be taken Concurrently)

NNE 618L. Focus on Advanced Nursing Practice Specialization. 3 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: (NUR 606 [Min Grade: B] or NUR 729 [Min Grade: B] or NUR 737 [Min Grade: B]) and (NUR 613 [Min Grade: B]) and NUR 614 [Min Grade: B](Can be taken Concurrently)

NNE 621. Advanced Neonatal Nursing I. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role of the Advanced Practice Nurse. The emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to neonates, infants, and young toddlers up to two years of age.
Prerequisites: NUR 612 [Min Grade: B] and (NUR 610 [Min Grade: B] or NUR 735 [Min Grade: B]) and NUR 613 [Min Grade: B] and (NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B])

NNE 622. Advanced Neonatal Nursing II. 4-5 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness of neonates, infants, and young toddlers up to the age of two. The focus of this course is on health promotion and disease prevention and management strategies from inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care to neonates, infants, and young toddlers up to the age of two.
Prerequisites: (NNE 621 [Min Grade: B] or NNE 621 [Min Grade: B]) and (NNE 685L [Min Grade: P] or NNE 685L [Min Grade: P])

NNE 623. Advanced Neonatal Nursing III. 4-5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course is on the utilization of complex models and systems of practice to deliver high quality evidence-based care to neonates, infants, and young toddlers up to the age of two. The emphasis of the course is on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: (NNE 622 [Min Grade: B] or NNE 622 [Min Grade: B]) and (NNE 686L [Min Grade: P] or NNE 686L [Min Grade: P])

NNE 684L. Practicum I: Neonatal Nurse Practitioner. 2-3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to neonates, infants, and young toddlers up to the age of two. The focus of this course is on the delivery of health care services to neonates, infants, and young toddlers up to the age of two. The emphasis of this course is on promoting the progression of competence within the Advanced Practice Nursing role.
Prerequisites: (NUR 612 [Min Grade: B] or NUR 612 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) and (NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B])

NNE 685L. Practicum II: Neonatal Nurse Practioner. 4 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to neonates, infants, and toddlers up to the age of two. The focus of this course is to provide the student with opportunities to integrate in depth diagnostic and management skills to provide care for neonates, infants, and toddlers up to the age of two. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: NNE 618L [Min Grade: P] and NNE 621 [Min Grade: B]

NNE 686L. Practicum III: Neonatal Nurse Practitioner. 4 Hours.
This course is the second of two practicum courses that will be followed by a residency. In selected clinical settings, students are expected to integrate the knowledge and competencies gained from foundation courses to begin to further develop the NNP Role.
Prerequisites: NNE 622 [Min Grade: B](Can be taken Concurrently) or NNE 622 [Min Grade: B](Can be taken Concurrently)

NNE 687. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the student's knowledge base.

NNE 692L. Practicum III : Neonatal Nurse Practitioner. 4 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to neonate, infant, and young toddler up to the age of two. The focus of this course is to evaluate progress toward achievement of professional competencies. The emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of neonate, infant, and young toddler up to the age of two.
Prerequisites: (NNE 622 [Min Grade: B] or NNE 622 [Min Grade: B]) and (NNE 685L [Min Grade: P] or NNE 685L [Min Grade: P])

NNE 718L. Focus on Advanced Nursing Practice. 3 Hours.
The purpose of this course is the study of specialty track-specific topics. The focus of the course is to provide foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: NUR 612 [Min Grade: B] and NUR 613 [Min Grade: B] and NUR 614 [Min Grade: B](Can be taken Concurrently)

NNE 721. Advanced Neonatal Nursing I. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to neonates.
Prerequisites: NNE 618L [Min Grade: P] and (NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B])

NNE 722. Advanced Neonatal Nursing II. 4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness for neonates in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The focus of this course is on the health promotion and disease prevention and the management of strategies form inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care of neonates.
Prerequisites: NNE 721 [Min Grade: B]

NNE 723. Advanced Neonatal Nursing III. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course in on the utilization of complex models and systems of practice to deliver high quality evidence-based care as a Doctor of Nursing Practice prepared Advanced Practice Nurse to neonates. The emphasis of the course in on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: NNE 722 [Min Grade: B] and NNE 785L [Min Grade: P]

NNE 784L. Practicum I: Neonatal Nurse Practitioner. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to neonates. The focus of this course is on the delivery of health care services to neonates. The emphasis of this course is on promoting the progression of competence within the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse.
Prerequisites: NNE 618L [Min Grade: P]

NNE 785L. Practicum II: Neonatal Nurse Practitioner. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to neonates. The focus of this course is to provide the student with opportunities to integrate in-depth diagnostic, management, and leadership skills in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse to provide care for neonates. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: NNE 721 [Min Grade: B] and NNE 784L [Min Grade: P]

NNE 786L. Practicum II: Neonatal Nurse Practitioner. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to neonates. The focus of this course is to provide the student with opportunities to integrate in-depth diagnostic, management, and leadership skills in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse to provide care for neonates. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: NNE 722 [Min Grade: B] and NNE 784L [Min Grade: P]

NNE 787. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the student's knowledge base.

NNE 792L. Practicum III: Neonatal Nurse Practitioner. 4 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to neonates. The focus of this course is to evaluate progress toward achievement of competencies of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of neonates.
Prerequisites: NNE 722 [Min Grade: B] and (NNE 785L [Min Grade: P] or NNE 786L [Min Grade: P])

NNI-Nursing - Informatics Courses

NNI 621. Conceptual Basis for Informatics Practice. 3 Hours.
This course is based on the concepts underpinning nursing informatics practice as delineated in the American Nurses Association s Scope and Standards of Nursing Informatics Practice. Students will explore theories of adult education, communication, systems, decision making, human-computer interaction and the concepts of data, information and knowledge. They will have the opportunity to learn how these theories and concepts are utilized in informatics practice.Prerequisite: NUR 643.
Prerequisites: NUR 643 [Min Grade: C](Can be taken Concurrently)

NNI 622. The Information System Life Cycle. 3 Hours.
This offering is designed to be the culminating course of the nursing informatics specialist curriculum. This course ties together all previous course work together in an application based review of the information system life cycle from systems analysis to system evaluation and maintenance. The course is designed to be taken in conjunction with a clinical experience in which the student will be exposed to aspects of the hands on application of course content.
Prerequisites: NUR 643 [Min Grade: C] and NNI 621 [Min Grade: B]

NNI 625. Organizational Process and Behavior. 3 Hours.
This course will assist the Nurse Informatician to understand and evaluate how organizations change and innovate with new information technologies to compete in the marketplaces, collaborate with partners, serve customers, motivate employees, and improve operations. This course provides the students with the opportunities to: learn the main theoretical perspectives on managing IT change through innovations: familiarize with current best practices and models of change of innovation through IT: and develop innovation skills in various organizational settings and within the framework of project management.
Prerequisites: (NUR 610 [Min Grade: C] or NUR 610 [Min Grade: C]) and (NHSA 631 [Min Grade: C] or NHSA 631 [Min Grade: C]) and NUR 643 [Min Grade: C](Can be taken Concurrently)

NNI 630. Biomedical Informatics Research. 3 Hours.
This course provides an overview of the field of biomedical informatics, including subfields ranging from bioinformatics to public health informatics, from the perspective of research accomplishments and challenges. Each topic will be taken from a historical perspective-where are we now and how did we get here 0 and then explore the current research directions. There will be emphasis on underlying concepts, theories and methods. Although this course can serve as a survey of the field, it is also intended for students who will pursue research in some area of biomedical informatics. This course would be useful for any students doing research using healthcare data.

NNI 631. Foundations ofNursing Informatics-Scope of Practice, Models, Standards, and Theories. 3 Hours.
In this course, the graduate nursing informatics student will be grounded in the Scope and Standards of Nursing Informatics (NI)Practice beginning with forming an understanding of the foundational model of all informatics: data to information to knowledge to wisdom (DIKW). NI students will then apply the DIKW model to an examination of concept oriented, standardized terminologies and the impact of this on evidence formation, outcomes, evaluation, and the calculation of the value of nursing. The graduate nursing informatics student will explore standards guiding interoperability, security, and data transfer. Lastly, the nursing informatics student will analyze and evaluate the role of the Informatics Nurse Specialist in leading change using relevant informatics theories.
Prerequisites: NHSL 604 [Min Grade: B] and NHSL 610 [Min Grade: B]

NNI 632. Nursing Informatics Systems Analysis and Design. 4 Hours.
Information systems development and implementation is a process in which technical, organizational, and human aspects of a system are analyzed with the goal of creating an improved and more efficient system. The process of systems analysis and design contains best practice process but is still largely an art. There is a high dependence on the skills of individual analysts and designers even though there are established principles, methods, and tools. This course will give nursing informatics graduate students an understanding of the most common tools, techniques, and theories currently used in healthcare information systems analysis and design.
Prerequisites: NNI 631 [Min Grade: B]

NNI 633. Informatics and Information Technology Review to Advance Care. 3 Hours.
In this course, the graduate informatics nurse student will be presented with the latest federal policies directing the infusion of technology at the point of care and the broad goals of expected impact on the health of the nation. A survey and critical appraisal of the latest technologies used in administrative, clinical, research, educational, and consumer spaces will be facilitated along with best practice implementation strategies and research to support optimal outcomes and quality.
Prerequisites: NNI 631 [Min Grade: B]

NNI 634. Informatics Project Evaluation/Human Factors. 3 Hours.
In this course, the graduate student informatics nurse will gain the knowledge and skills to effectively develop an evaluation protocol for the implementation of a health information technology. This course will assist the student to understand the challenges of evaluation in this specialization. Stude3nts will: determine objectives for study; design a study methodology; offer possible measurement tools; and will compare and contrast analyses. This course will include a review of human factors as part of the measurement process.
Prerequisites: NNI 632 [Min Grade: B] and NNI 633 [Min Grade: B] and NHSA 631 [Min Grade: B]

NNI 635. Essentials of Project Management for Nursing Information Specialists. 3 Hours.
This course emphasizes the application of nursing informatics theories, models, and skill to the role of the informatics nurse specialist as a project manager. In this course, students will demonstrate the application of the concepts, principles, and practices of formal informatics project management through the knowledge, skills, and competencies of an informatics nurse specialist. An informatics project will be planned, implemented and evaluated in a selected healthcare-related setting.
Prerequisites: NNI 632 [Min Grade: B] or NNI 633 [Min Grade: B] or NHSA 631 [Min Grade: B]

NNI 636. Data Analytics for the Informatics Nurse Specialist. 3 Hours.
The purpose of this course is to provide the informatics nurse specialist graduate students with an overarching knowledge of Big Data, Data Lifecycle, and the use of advanced technologies with Big Data in healthcare while considering the current challenges. The focus of the course will be to master the domain knowledge and appropriate theories while mastering the use of analytics software using a real-life large dataset. The emphasis of this course will be for the students to apply this knowledge through the use and application of data visualization software to answer healthcare questions/problems. students will: propose study questions/problems; visually display data results through a data visualization software (Tableau); and synthesize their questions and answers. A presentation of results will be the culminating experience.
Prerequisites: NHSL 604 [Min Grade: B] and NHSL 606 [Min Grade: B] and NHSL 610 [Min Grade: B] and NNI 631 [Min Grade: B] and NNI 632 [Min Grade: B] and NNI 634 [Min Grade: B]

NNI 685L. Nursing Informatics: Practicum I. 2 Hours.
This course provides an experimental base for students to develop and implement the role of the informatics nurse specialist. Emphasis is placed on the synthesis and application of the theories and concepts that provide the basis of informatics practice. Students will develop the ability to collaborate in multidisciplinary groups, identifying areas for the design and implementation of administrative and clinical technological applications. Students will spend 100 hours during the semester working with a clinical informatics specialist in practice.

NNI 686L. Nursing Informatics: Practicum II. 2 Hours.
This course provides an experimental base for students to develop and implement the role of the informatics nursing specialist at the organizational level. Students will be paired with a nursing informatics specialist working on aspects of system analysis, design, implementation and evaluation. This experience requires the student synthesize knowledge gained in all previous courses in the curriculum. This course includes 100 hours of clinical practice and is designed to function as the clinical capstone to the NNI curriculum. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation.
Prerequisites: NNI 685L [Min Grade: P]

NNI 687. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the student's knowledge base.

NNI 730. Biomedical Informatics Research. 3 Hours.
This course provides an overview of the field of biomedical informatics, including subfields ranging from bioinformatics to public health informatics, from the perspective of research accomplishments and challenges. Each topic will be taken from historical perspective- where are we now and how did we get here- and then explore the current research directions. There will be emphasis on underlying concepts, theories and methods. Although this course can serve as a survey of the field, it is also intended for students who will pursue research in some area of biomedical informatics. This course would be useful for any student doing research using healthcare data.

NOH-Nursing -Occupational Hlth Courses

NOH 624. Total Worker Health and Worker Wellbeing: Program Design to Evaluation. 3 Hours.
The purpose of this course is to apply principles of basic sciences, theories, and research related to occupational health for the improvement of workers' health. This course focuses on the evaluation of workplace policies, programs, and practices through the lens of work as a social determinant of health. The emphasis of this course is the utilization of assessment data to design, implement, and evaluate evidence-based interventions that promote workers' safety, health, and well-being.

NOH 625. Principles and Practice of Occupational Safety, Ergonomics, and Industrial Hygiene. 3 Hours.
The purpose of this course is to introduce major concepts from occupational safety, ergonomics, and industrial hygiene and the collaborative relationship among occupational health and safety professionals. Emphasis is on exploring risk factors in disciplines to control injury and illness in the national and international workplace. Students will also develop an appreciation of the history of occupational health along with an understanding of legal and regulatory influences on worker populations.

NOH 626. Emergency Management & Disaster Preparedness. 3 Hours.
The purpose of this course is to prepare occupational health professionals to effectively manage emergencies and prepare for disasters. Emergency management and disaster preparedness traditionally referred to natural disasters and now included violence in the workplace and infectious diseases. Emphasis is placed on the application of these principles in community and occupational settings.

NPA-Nursing - Palliative Care Courses

NPA 621. Advanced Palliative Care Nursing I. 3 Hours.
The purpose of this course is to provide a theoretical and practical foundation for students to diagnose and manage the health needs of the patient and family in the delivery of palliative care across the life span. The focus of the course is on interdisciplinary, holistic palliative care management strategies. The emphasis of the course is on critical thinking, research, ethics, cultural competence, disease management, complication prevention and healthcare delivery as they apply to chronic disease management and quality of life for the palliative care patient and family.
Prerequisites: (NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B])

NPA 622. Advanced Palliative Care Nursing II. 3 Hours.
The purpose of this course is to provide the student with opportunities to integrate in-depth knowledge of health assessment and management skills to provide care for clients with commonly occurring chronic and complex health problems as well as palliative care problems. The focus of the course is the development of strategies to market the nurse practitioner role, to create a specific practice position, and to explore strategies to market palliative care and their role in family health care. The emphasis of the course is on critical thinking, health promotion, disease prevention, scientific integrity and ethics, human diversity and social issues, professional role development, education and marketing.
Prerequisites: NPA 621 [Min Grade: B] or NPA 621 [Min Grade: B]

NPA 626. Palliative Care for Advanced Nursing Practice I. 3 Hours.
This course provides a theoretical and practical foundation for students to diagnose and manage the health needs of the palliative care patient and family in the delivery of culturally competent care across the life span. Content includes multidisciplinary management strategies to holistic healthcare delivery as it applies to administration of culturally competent palliative care. This course will utilize discussion, online activities for application of class content, readings, lecture and guest lecture approach to supplement text readings and online delivery of didactic content. The students are expected to apply culturally competent and palliative care theories to clinical assessment and decision-making strategies in order to provide direct patient care to the palliative care patient and family. Prerequisite: NUR 614L. Corequisite: NPA 685L.
Prerequisites: NUR 614L [Min Grade: B] and NUR 613 [Min Grade: B] (Can be taken Concurrently) or NUR 613 [Min Grade: B](Can be taken Concurrently)

NPA 627. Palliative Care for Advanced Nursing Practice II. 3 Hours.
This course is designed to provide the student with opportunities to integrate in-depth knowledge of health assessment and management skills to provide care for patients with commonly occurring palliative care problems. Students will also have the opportunity to develop strategies to market the advanced practice nurse role, to create a specific practice position and to explore strategies to market their role in health care. The following elements are integrated into the course: critical thinking, health promotion, disease prevention and palliative care, scientific integrity and ethics, human diversity and social issues and professional role development. Corequisite: NPA 686L.
Prerequisites: (NPA 626 [Min Grade: B] or NPA 626 [Min Grade: B])

NPA 685L. Practicum: Advanced Palliative Care. 2-4 Hours.
The purpose of this course is for the student to develop the Palliative Care Nurse Practitioner role by providing health and palliative care services to clients across the lifespan, families, and groups while emphasizing the promotion of health, the prevention of disease and the palliative care for life altering conditions. The focus of the course is on application of knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. The emphasis of this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, and includes role components such as interdisciplinary collaborator, coach, educator, and consultant.
Prerequisites: (NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B]) and NPA 621 [Min Grade: B](Can be taken Concurrently) or NPA 621 [Min Grade: B] (Can be taken Concurrently) or NPA 622 [Min Grade: B](Can be taken Concurrently) or NPA 622 [Min Grade: B](Can be taken Concurrently)

NPA 686L. Practicum: Culturally Competent Palliative Care Nurse Practitioner II. 3 Hours.
This course allows the student to develop the Culturally Competent Palliative Care Nurse Practitioner role by providing health and palliative care services to clients across the lifespan, families and groups while emphasizing the promotion of health, the prevention of disease and palliative care for life altering conditions throughout the course of clinical experiences over two academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. An Objective Structured Patient Experience held during this course will determine if the student can progress into 6 hours of the final residency course, NCA 692L. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NPA 621 and NPA 685L. Corequisite: NPA 622.
Prerequisites: NPA 685L [Min Grade: P] or NPA 685L [Min Grade: P]

NPA 692L. Residency: Culturally Competent Palliative Care Nurse Practitioner. 3-6 Hours.
This course prepares the student in the Culturally Competent Palliative Nurse Practitioner role to be a beginning expert in the diagnosis and management of client's health problems. During residency, the student is expected to continue growth toward becoming an independent practitioner, specializing in the culturally competent care of clients from across the lifespan. The student further develops the Palliative Care Nurse Practitioner role with patient/clients by providing health care services to clients (i.e. individuals, families, groups) emphasizing the promotion of health, prevention of disease and/or palliation of symptoms of life-altering diseases. A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NPA 622 and NPA 686L.
Prerequisites: (NPA 627 [Min Grade: B] or NPA 627 [Min Grade: B]) and (NPA 685L [Min Grade: P] or NPA 685L [Min Grade: P]) and (NPA 686L [Min Grade: P] or NPA 686L [Min Grade: P])

NPE-Nursing - Pediatrics Courses

NPE 613. Primary Care Pediatric Pharmacology. 1 Hour.
This course is a supplement course for Primary Care Practitioner students to provide them with information necessary to safely and competently prescribe medications for infants, children and adolescents. It complements the information provided in NUR 613 Pharmacology and Therapeutics but focuses on the unique physiologic and metabolic characteristics of this population.Pre or corequisite: NUR 613.
Prerequisites: NUR 613 [Min Grade: B](Can be taken Concurrently) or NUR 613 [Min Grade: B](Can be taken Concurrently)

NPE 618L. Focus on Advanced Nursing Practice Specialization. 3 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: (NUR 606 [Min Grade: B] or NUR 729 [Min Grade: B] or NUR 737 [Min Grade: B]) and (NUR 613 [Min Grade: B]) and NUR 614 [Min Grade: B](Can be taken Concurrently)

NPE 621. Advanced Pediatric Nursing I - Primary Care. 4-5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role of the Advanced Practice Nurse. The emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to primary care pediatric patients and their families.
Prerequisites: (NUR 612 [Min Grade: B] or NUR 612 [Min Grade: B]) and (NUR 610 [Min Grade: B] or NUR 610 [Min Grade: B]) or (NUR 735 [Min Grade: B] or NUR 735 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) and (NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B])

NPE 622. Advanced Pediatric Nursing II - Primary Care. 4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness of primary care pediatric patients and their families. The focus of this course is on health promotion and disease prevention and management strategies from inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care to primary care pediatric patients and their families.
Prerequisites: (NPE 621 [Min Grade: B] or NPE 621 [Min Grade: B]) and (NPE 685L [Min Grade: P] or NPE 685L [Min Grade: P])

NPE 623. Advanced Pediatric Nursing III - Primary Care. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course is on the utilization of complex models and systems of practice to deliver high quality evidence-based care to primary care pediatric patients and their families. The emphasis of the course is on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: (NPE 622 [Min Grade: B] or NPE 622 [Min Grade: B]) and (NPE 686L [Min Grade: P] or NPE 686L [Min Grade: P])

NPE 685L. Practicum I: Pediatric Nurse Practitioner –Primary Care. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to primary care pediatric patients and their families. The focus of this course is on the delivery of health care services to primary care pediatric patients and their families. The emphasis of this course is on promoting the progression of competence within the Advanced Practice Nursing role.
Prerequisites: (NUR 612 [Min Grade: B] or NUR 612 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) and (NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B])

NPE 686L. Practicum II: Pediatric Nurse Practitioner –Primary Care. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to primary care pediatric patients and their families. The focus of this course is to provide the student with opportunities to integrate in depth diagnostic and management skills to provide care for primary care pediatric patients and their families. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: (NPE 621 [Min Grade: B] or NPE 621 [Min Grade: B]) and (NPE 685L [Min Grade: P] or NPE 685L [Min Grade: P])

NPE 687. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the student's knowledge base.

NPE 687L. Practicum III: Primary Care Pediatric Nurse Practitioner. 2 Hours.
This course prepares the student in the Pediatric Nurse Practitioner role. The student develops the Pediatric NP role with patients/clients by providing pediatric health care services to clients (i.e. individuals, families, groups) emphasizing the promotion of health and the prevention of disease throughout the course of clinical experiences over two or three academic terms. Further, the student continues to apply knowledge and current research findings to the management of actual and potential health problems, which include common diseases and human responses to disease. It is anticipated that the student will be increasingly independent and skilled as each clinical experience progresses, allowing him/her to become more proficient and to contribute to the management of more complex health problems. The following elements are integrated into the course: critical thinking, professional presentations, research utilization, scientific integrity and ethics, human diversity and social issues. The advanced practice role emphasis in this course encompasses a trajectory of the nurse practitioner experience from novice to beginning expert, including interdisciplinary collaboration, coach, educator, consultant roles. Prerequisite: NPE 622 and NPE 686L. Corequisite: NPE 623.
Prerequisites: (NPE 622 [Min Grade: B] and NPE 686L [Min Grade: P]) or (NPE 622 [Min Grade: B] and NPE 686L [Min Grade: P])

NPE 692L. Practicum III: Pediatric Nurse Practitioner –Primary Care. 4 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to primary care pediatric patients and their families. The focus of this course is to evaluate progress toward achievement of professional competencies. The emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of primary care pediatric patients and their families.
Prerequisites: (NPE 622 [Min Grade: B] or NPE 622 [Min Grade: B]) and (NPE 686L [Min Grade: P] or NPE 686L [Min Grade: P])

NPE 718L. Focus on Advanced Nursing Practice. 3 Hours.
The purpose of this course is the study of specialty track-specific topics. The focus of the course is to provide foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: NUR 612 [Min Grade: B] and NUR 613 [Min Grade: B] and NUR 614 [Min Grade: B](Can be taken Concurrently)

NPE 721. Advanced Pediatric Nursing I - Primary Care. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to primary care pediatric patients and their families.
Prerequisites: NPE 618L [Min Grade: P] and (NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B])

NPE 722. Advanced Pediatric Nursing II - Primary Care. 4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness for primary care pediatric patients and their families in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The focus of this course is on the health promotion and disease prevention and the management of strategies form inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care of primary care pediatric patients and their families.
Prerequisites: NPE 721 [Min Grade: B]

NPE 723. Advanced Pediatric Nursing III - Primary Care. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course in on the utilization of complex models and systems of practice to deliver high quality evidence-based care as a Doctor of Nursing Practice prepared Advanced Practice Nurse to primary care pediatric patients and their families. The emphasis of the course in on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: NPE 722 [Min Grade: B] and NPE 786L [Min Grade: P]

NPE 785L. Practicum I: Pediatric Nurse Practitioner - Primary Care. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to primary care pediatric patients and their families. The focus of this course is on the delivery of health care services to primary pediatric patients and their families. The emphasis of this course is on promoting the progression of competence within the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse.
Prerequisites: NPE 618L [Min Grade: P]

NPE 786L. Practicum II: Pediatric Nurse Practitioner –Primary Care. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to primary care pediatric patients and their families. The focus of this course is to provide the student with opportunities to integrate in-depth diagnostic, management, and leadership skills in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse to provide care for primary care pediatric patients and their families. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: NPE 721 [Min Grade: B] and NPE 785L [Min Grade: P]

NPE 787. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the student's knowledge base.

NPE 792L. Practicum III: Pediatric Nurse Practitioner - Primary Care. 4 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to pediatric patients and their families. The focus of this course is to evaluate progress toward achievement of competencies of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of pediatric patients and their families.
Prerequisites: NPE 722 [Min Grade: B] and NPE 786L [Min Grade: P]

NPN-Psyc Mental Hlth Nur Prac Courses

NPN 613. Psychopharmacology for Advanced Practice Nursing. 3 Hours.
This course will provide advanced knowledge of psychobiological information in conjunction with the use of psychopharmacological interventions with patients. This course will focus on the pharmacokinetics and clinical management including prescription of medications for psychiatric disorders. Prerequisite: NUR 613, NPN 621 and NPN 685L.
Prerequisites: (NUR 613 [Min Grade: B] and NPN 621 [Min Grade: B] and NPN 685L [Min Grade: P]) or (NUR 613 [Min Grade: B] and NPN 621 [Min Grade: B] and NPN 685L [Min Grade: P])

NPN 618L. Focus on Advanced Nursing Practice Specialization. 3 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: (NUR 606 [Min Grade: B] or NUR 729 [Min Grade: B] or NUR 737 [Min Grade: B]) and (NUR 613 [Min Grade: B]) and NUR 614 [Min Grade: B](Can be taken Concurrently)

NPN 621. Advanced Psych Mental Health Nursing I. 4-5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice psychiatric nursing. The focus of this course is to prepare the student to implement the role of the Psychiatric Advanced Practice Nurse. The emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to a psychiatric population across the lifespan.
Prerequisites: (NUR 612 [Min Grade: B] or NUR 612 [Min Grade: B]) and (NUR 610 [Min Grade: B] or NUR 610 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) or (NUR 735 [Min Grade: B] or NUR 735 [Min Grade: B]) and (NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B])

NPN 622. Advanced Psychiatric/ Mental Health Nursing II. 4,5 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness of psychiatric patients across the lifespan. The focus of this course is on health promotion and disease prevention and management strategies for psychiatric patients from inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care to psychiatric patients across the lifespan.
Prerequisites: (NPN 621 [Min Grade: B] or NPN 621 [Min Grade: B]) and (NPN 685L [Min Grade: P] or NPN 685L [Min Grade: P])

NPN 623. Advanced Psychiatric/ Mental Health Nursing III. 4 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice psychiatric nursing. The focus of this course is on the utilization of complex models and systems of practice to deliver high quality evidence-based care to psychiatric patients across the lifespan. The emphasis of the course is on the critical analysis of the evidence for applications that optimize health in psychiatric patients across the lifespan.
Prerequisites: (NPN 622 [Min Grade: B] or NPN 622 [Min Grade: B]) and (NPN 686L [Min Grade: P] or NPN 686L [Min Grade: P])

NPN 685L. Practicum I: Psychiatric Nurse Practitioner. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to psychiatric and substance use patients across the lifespan. The focus of this course is to provide the student with opportunities to integrate in depth diagnostic and management skills to provide care for psychiatric patients across the lifespan. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: (NUR 612 [Min Grade: B] or NUR 612 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) and (NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B]) or (NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B])

NPN 686L. Practicum II: Psychiatric/ Mental Health Nurse Practitioner. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to psychiatric patients across the lifespan. The focus of this course is on the delivery of health care services to psychiatric patients across the lifespan. The emphasis of this course is on promoting the progression of competence within the Advanced Practice Nursing role.
Prerequisites: (NPN 621 [Min Grade: B] or NPN 621 [Min Grade: B]) and (NPN 685L [Min Grade: P] or NPN 685L [Min Grade: P])

NPN 687. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the student's knowledge base.

NPN 692L. Practicum III: Psych Mental Health Nurse Practitioner. 1-6 Hour.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to psychiatric patients across the livespan. The focus of this course is to evaluate progress toward achievement of professional competencies in advanced practice psychiatric nursing. The emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of psychiatric patients across the lifespan.
Prerequisites: (NPN 622 [Min Grade: B] or NPN 622 [Min Grade: B]) and (NPN 686L [Min Grade: P] or NPN 686L [Min Grade: P])

NPN 718L. Focus on Advanced Nursing Practice. 3 Hours.
The purpose of this course is the study of specialty track-specific topics. The focus of the course is to provide foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: NUR 612 [Min Grade: B] and NUR 613 [Min Grade: B] and NUR 614 [Min Grade: B](Can be taken Concurrently)

NPN 721. Advanced Psychiatric/Mental Health Nursing I. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to the psychiatric population across the lifespan.
Prerequisites: NPN 618L [Min Grade: P] and (NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B])

NPN 722. Advanced Psychiatric/Mental Health Nursing II. 5 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness for the psychiatric population across the life-span in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The focus of this course is on the health promotion and disease prevention and the management of strategies form inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care of the psychiatric population across the life-span.
Prerequisites: NPN 721 [Min Grade: B]

NPN 723. Advanced Psychiatric/Mental Health Nursing III. 4 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course in on the utilization of complex models and systems of practice to deliver high quality evidence-based care as a Doctor of Nursing Practice prepared Advanced Practice Nurse to the psychiatric population across the life-span. The emphasis of the course in on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: NPN 722 [Min Grade: B] and NPN 786L [Min Grade: P]

NPN 785L. Practicum I: Psychiatric/Mental Health Nurse Practitioner. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to the psychiatric population. The focus of this course is on the delivery of health care services to the psychiatric population. The emphasis of this course is on promoting the progression of competence within the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse.
Prerequisites: NPN 618L [Min Grade: P]

NPN 786L. Practicum II: Psychiatric/Mental Health Nurse Practitioner. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to the psychiatric population across the life-span. The focus of this course is to provide the student with opportunities to integrate in-depth diagnostic, management, and leadership skills in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse to provide care for the psychiatric population across the life-span. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: NPN 721 [Min Grade: B] and NPN 785L [Min Grade: P]

NPN 787. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the students' knowledge base.

NPN 792L. Practicum III: Psych Mental Health Nurse Practitioner. 4 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to the psychiatric population. The focus of this course is to evaluate progress toward achievement of competencies of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of the psychiatric population.
Prerequisites: NPN 722 [Min Grade: B] and NPN 786L [Min Grade: P]

NPP- NUR - Pediatric Pulmonary Courses

NPP 685. Interdisciplinary Pediatric Pulmonary Care I. 3 Hours.
This course provides the trainee with the opportunity to analyze ideas, concepts and theories relative to the delivery of healthcare to pediatric pulmonary patients. Emphasis will be focused on the acquisition of in-depth knowledge of all aspects of the well child. Chronic respiratory disease is presented as the model to demonstrate the effects of chronic illness of the child and family. Trainees are introduced to basic respiratory anatomy and physiology, diagnostic procedures and various treatment modalities. Throughout the term, trainees will be expected to apply the knowledge and skills acquired to selected clinical assignments.

NPP 686. Interdisciplinary Pediatric Pulmonary Care II. 3 Hours.
NPP 686 provides the traninee with the opportunity to analyze ideas, concepts and theories relative to the delivery of healthcare to pediatric pulmonary patients. Emphasis will be focused on the acquisition for in-depth knowledge of all aspects of the well child. Chronic respiratory disease is presented as the model to demonstrate the effects of chronic illness on the child and family. Trainees are introduced to basic respiratory anatomy and physiology, diagnostic procedures and various treatment modalities. Throughout the term, trainees will be expected to apply the knowledge and skills acquired to selected clinical assignments.

NPR-NUR Promo/Protect/Rest Hlt Courses

NPR 760. Conceptual Foundations for Promoting, Protecting, and Restoring Health. 3 Hours.
This course will be focused on theories, concepts and research related to promoting, protecting and restoring health. Students are expected to analyze cultural, social, racial and gender influences on health and research related to health promotion, protection and restoration.

NPR 761. Interventions to Promote, Protect, and Restore Health. 3 Hours.
This course will be focused on in-depth exploration and critical analysis of current intervention research including conceptual and methodological issues. In addition, the course will be focused on designing research to evaluate the outcomes of interventions designed to promote, protect or restore health on individuals or community groups.

NRM-Nursing - Research Methods Courses

NRM 750. Foundations of Quantitative Research. 3 Hours.
This course is a survey of quantitative research methods and the first required research core course in the PhD doctoral nursing program. The course is designed to prepare PhD doctoral nursing students with the research knowledge and skills to: (1) critically evaluate research; (2) use the process of research to examine questions identified in one's own nursing practice; and (3) contribute to expansion of nursing's knowledge base. This course will include integration of the following elements and/or activities: critical thinking, critique and synthesis of quantitative research literature in a focused area of interest, scholarly writing, scientific integrity and ethics, human diversity, and social issues. Students will apply criteria for the critique of research to assess the design, methods and validity of research findings. Students will be exposed to various critique frameworks for both quantitative and qualitative research. Strategies for conducting both systematic and integrated reviews will be addressed. The advanced practice role emphasis of this course is that of investigator, research collaborator, and content expert in a selected practice field.

NRM 752. Responsible Conduct of Research. 2 Hours.
This course will examine a wide range of historical and modern treatises that have shaped ethical practices and medical ethical theories both in the United States and globally. The course will emphasize comparing and contrasting various world views of ethical research practice from a cultural and global perspective. The content will focus on ethical principles such as respect for persons, autonomy, justice and rights-based codes. In addition, the expectations and regulations of Institutional Review Boards will be examined with an emphasis on developing effective strategies to expedite approval of student research applications. In addition, students will complete and provide proof of current completion of the UAB IRB training course as an initial pass/fail learning activity. This course will also include integration of the following elements and/or activities: critical thinking, informatics, collaboration, scholarly writing, preparing/giving professional presentations, theory evaluation and application, human diversity, cultural competence, global concerns and health disparity issues. The advanced role emphasis of this course is that of investigator, research collaborator, and content expert in a selected practice field.

NRM 761. Research in Children with Chronic Health Conditions. 3 Hours.
This course provides students with an understanding of the ethical developmental and regulatory considerations necessary for the responsible conduct of research in children with chronic illness. The focus of this course is on critical evaluation of published research in populations of children with chronic illness, understanding of scientific and methodological considerations necessary when conducting research involving children, and development of a mock research proposal focused on a question of importance to the field that addresses processes necessary to assure appropriate protection of pediatric research participants. Inter-professional enrollment on this course is encouraged.

NRM 770. Designs for Nursing Studies I. 3 Hours.
Designs For Nursing Studies I. In this course, special emphasis is placed upon the beginning phases of the research process, including formulation of research questions/aims, integration of theory and/or conceptual framework in the development of research, the critique and review of knowledge that support an identified area of research, and the discussion of the type of research design. Cultural implications and ethical standards for research will be addressed.

NRM 771. Methods/Measurement In Nursing Research. 3 Hours.
Instrumentation in nursing research involves measurement of biological, psychological and/or sociological aspects of human systems. This course is an overview of the theories, principles and techniques that yield reliable and valid measurement of human systems. Opportunities will be provided to evaluate the psychometric properties of selected measures and strategies. This course is designed to aid the student in writing the measurement section of a research proposal in the focal area. 999999.

NRM 772. Designs of Nursing Studies II. 3 Hours.
Designs for Nursing Studies II. This course focuses on sampling, collection of data, data analysis plans, presentation of findings, conclusions in various research designs and the reintegration of the findings into the body of knowledge in an indentified area of research. Ethical and cultural issures relateded to the conduct of research will be addressed. Students will develope a research proposal.

NRM 773. Qualitative Research Methods. 4 Hours.
This core course focuses on sampling, design, analysis plans, presentation of results, findings, and conclusions in various research designs and the reintegration of the findings into the body of knowledge in an identified area of research. Ethical and cultural issues related to the conduct of research are also examined.

NRM 774. Designs and Methods for Research of Vulnerable Populations With Health Disparities. 3 Hours.
This course is designed for doctoral level students in nursing and other health-related disciplines. Special emphasis is placed on critical analysis of health disparities research, and the integration of theory and empirical evidence in designing studies of vulnerable populations such as minorities and other underserved populations. Issues of race, gender, age, ethnicity, social class and cultures are examined in relation to research design and successful implementation of research studies. Intervention approaches commonly used in health disparities research will be evaluated and ethical issues of relevance to vulnerable populations will be explored.

NRM 775. Research on Applied Cognitive Neuroscience for Health Professionals. 3 Hours.
This elective course for the PhD program provides the student with knowledge in the fundamentals of behavioral neuroscience and cognitive psychology as it relates to intervention studies and research designs. The student has an opportunity to practice cognitive assessment, develop behavioral intervention plans, and design research studies involving such knowledge.

NRM 777. Mixed Methods Research I: Introduction to the Field. 3 Hours.
The course will provide students with an introduction to the field of mixed methods research. The course will focus on understanding what constitutes mixed methods research, its fundamental principles, and the main trends, issues, and debates involved in the application of this research approach. Students will examine the process of mixed methods research, including its definition, rationale for using it, the key characteristics, major design applications, and means of assessing the quality of mixed methods inferences. In addition, students will learn how the mixed methods research process is shaped by personal, interpersonal, and social contexts and how mixed methods intersects with other quantitative and qualitative research approaches and designs.

NRM 778. Mixed Methods Research II: Designing and Conducting a Mixed Methods Study. 3 Hours.
Building on the foundation knowledge received in Mixed Methods Research I, the course will provide students with knowledge and skills of designing and conducting mixed methods studies in social and health sciences. The topics will include types of research problems addressed, specification of mixed methods purpose statements and research questions, types of mixed methods designs, data collection and analysis strategies within mixed methods designs, and procedures for reporting and evaluating mixed methods studies. Students will get applied knowledge of choosing an appropriate mixed methods design, following the steps in designing and conducting a mixed methods study, and visually presenting mixed methods procedures employed in the study. Students will develop a proposal for a mixed methods study with the major emphasis on the study methodology.

NRM 779. Mixed Methods Application in Community-Based Action Research. 3 Hours.
The course will provide students with a detailed overview of how mixed methods can be applied in designing and conducting community-based action research studies. The topics will include: community-based action research, its purposes and cross-disciplinary utilization; a mixed methods methodological framework for action research; steps in designing and conducting mixed methods action research studies in community settings; specific types of mixed methods action research designs; sampling, data collection, analysis, validation, and evaluation of mixed methods action research projects. Students will get applied knowledge of choosing an appropriate mixed methods action research design, of applying the steps to designing and conducting a mixed methods action research study, and visually presenting the procedures employed in the study. Students will develop a proposal for a mixed methods action research study with the major emphasis on the study methodology.

NRM 780. Application of Research Design Principles I. 3 Hours.
In this course, special emphasis is placed upon the beginning phases of the research process, including formulation of research questions/aims, integration of theory and/or conceptual framework in the development of research, the critique and review of knowledge that support an identified area of research, and the discussion of the type of research design. Cultural implications and ethical standards for research will be addressed.

Prerequisites: (NRM 750 [Min Grade: B] or NRM 750 [Min Grade: B]) and (NUR 755 [Min Grade: B] or NUR 755 [Min Grade: B])

NRM 781. Quantitative Measurement in Research. 3 Hours.
The purpose of this course is to provide the student with the knowledge of how to best measure bilogical, psychological and/or sociological variables within individuals, families, and/or systems. This course includes an overview of the theories, principles and techniques that yield effective operationalization in order to obtain valid and reliable measurements.
Prerequisites: NRM 750 [Min Grade: B]

NRM 782. Application of Research Design Principles II. 3 Hours.
This course focuses on proposal development to include design, sampling, data collection, and data analysis plans for a focal area of interest. Ethical and cultural issues related to the conduct of research will be addressed.
Prerequisites: NRM 780 [Min Grade: B] and NRM 783 [Min Grade: B] and NST 778 [Min Grade: B] and NST 758 [Min Grade: B]

NRM 783. Foundations of Qualitative Research. 3 Hours.
The purpose of this course is to examine research traditions that guide the collection and analysis of qualitative data in the development of science. Included are naturalistic, conceptual, interpretive and analytical research methods such as phenomenology, grounded theory, ethnography, descriptive inquiry and narrative inquiry.

NRM 784. Qualitative Research: A Grounded Theory Approach. 3 Hours.
This course will provide students with in-depth knowledge of the historical origins, philosophical and theoretical foundations, methodological principles and applications of a grounded theory qualitative research approach. Students will explore types of research problems addressed, specification of the purpose statement and research questions, sampling, data collection and analysis strategies, establishing credibility and trustworthiness, and procedures for reporting a grounded theory study. The course will provide a structured field experience of designing and conducting a small-scale grounded theory study. The use of qualitative research software NVivo for data organization, management and analysis will be emphasized.

NRM 785. Qualitative Research: Analysis and Interpretation. 3 Hours.
The course will provide students with applied knowledge of data analysis and interpretation in qualitative inquiry. Students will understand the nature of qualitative data and explore different approaches to qualitative data analysis. The course will provide a structured experience of learning how to analyze, interpret, display and report qualitative data and results within five basic approaches to qualitative inquiry (narrative, case study, ethnography, grounded theory, and phenomenology). Students will develop basic skills in using qualitative research software NVivo for data organization, management and analysis.

NRM 786. Qualitative Research: Case Study and Ethnographic Approaches. 3 Hours.
The course will provide students with in-depth knowledge of the historical origins, philosophical and theoretical foundations, methodological principles and applications of case study and ethnographic qualitative research approaches. Students will explore types of research problems addressed, specification of the purpose statement and research questions, sampling data collection and analysis strategies, establishing credibility and trustworthiness, and procedures for reporting a case study and ethnography. The course will provide a structured field experience of designing and conducting a small-scale case study or an ethnographic study. The use of qualitative research software NVivo for date organization, management and analysis will be emphasized.

NRM 787. Qualitative Research: A Phenomenological Approach. 3 Hours.
The course will provide students with an in-depth knowledge of the historical origins, philosophical and theoretical foundations, methodological principles and applications of a phenomenological qualitative research approach. Students will explore types of research problems addressed, specification of the purpose statement and research questions, sampling, data collection and analysis strategies, establishing credibility and trustworthiness, and procedures for reporting a phenomenological study. The course will provide a structured field experience of designing and conducting a small scale phenomenological study. The use of qualitative research software NVivo for data organization, management and analysis will be emphasized.

NRM 798L. Research Immersion. 3-6 Hours.
The purpose of this course is to provide the student the opportunity to participte as a member of an established and funded research team. Research team members will mentor students taking part in relevant research experiences. Students will be expected to participate in various research activities including, but not limited to, research team meetings, consent of study participants, intervention implementation, data collection, data base management, data analysis, and manuscript preparation. Students will apply concepts and principles from research core courses in their research immersion experience. As part of an established funded research team, students will explore various research team roles and responsibilities. Additionally, students will take the opportunity to learn about and participate in various components of the UAB research enterprise. Through the research immersion experiences, students will learn about sources and mechanisms of research funding and strategies for dissemination of research findings. As appropriate, students will participate as a member of an established funded research team in preparation and dissemination of reports of research findings. Students will also have the opportunity to work with research team members in analysis, interpretation of findings and in the development manuscripts, research presentations and posters for dissemination.
Prerequisites: NRM 750 [Min Grade: B] and (NRM 752 [Min Grade: B] or NRM 780 [Min Grade: B])

NST- NUR - Statistical Methods Courses

NST 755. Data Mining & Statistical Techniques. 3 Hours.
This course covers major concepts and algorithms of data mining. The course will be taught using the SAS Enterprise Miner program. The final project will demonstrate all the data mining techniques covered in the course and furthermore expose students working with real data. At the end of the course students will be proficient in utilizing data mining techniques to exploit data patterns and behavior, gain insider understanding of the data, and produce new knowledge that healthcare decision-makers can act upon.
Prerequisites: NUR 756 [Min Grade: B]

NST 758. Inferential Statistics I. 3 Hours.
The purpose of this course is to provide an underpinning for the understanding of statistical methods and findings. Students will gain an understanding of common statistical models and applications of probability, sampling distributions, parametric and non-parametric one and two sample tests, confidence intervals, applications of analysis of two-way contingency table data, simple linear regression, and simple analysis of varience.
Prerequisites: NST 778 [Min Grade: B]

NST 772. Data Mining and Statistical Learning I. 3 Hours.
NST 772 is an elective course for PhD students. This is the first course in a two-course series that provides further exposition of advanced statistical analysis and data mining techniques for students interested in doing research that involves considerable quantitative analysis in their dissertation and/or future professional work.

NST 773. Data Mining/Stats Learning II. 3 Hours.
NST 773 is an elective course for PhD students. This is the second course in a two-course series that provides further exposition of advanced statistical analysis and data mining techniques for students interested in doing research that involves considerable quantitative analysis in their dissertation and/or future professional work.
Prerequisites: NST 772 [Min Grade: B] or NST 772 [Min Grade: B]

NST 775. Introduction to Statistical Software Packages: SPSS and SAS. 2 Hours.
Special emphasis of this laboratory course will be on the use of the statistical packages, SAS and SPSS, in the creation of the data files, data entry, manipulation of data, descriptive analysis and selected statistical techniques.

NST 776. Linear Models For Clinical Nursing Research. 3 Hours.
Linear Models For Clinical Nursing Research. This course is designed as a survey course on the application of advanced General Linear Model and related techniques in health care research. The course will focus on application to research questions of importance to nursing, with an emphasis on practice-related problems.

NST 777. Multivariate Statistical Methods For Clinical Nursing Research. 3 Hours.
Multivariate Methods For Clinical Nursing Research. This course is designed as a survey course on the application of multivariate techniques in health care research. The course will focus on application of multivariate statistical methods to nursing-related research questions, with emphasis on interpretation within clinical nursing research problems.

NST 778. Data Management. 2 Hours.
A hands-on exposure to data management with common statistical software packages, including concepts of types of variables, data entry and cleaning, importing and converting datasets, merging and concatenating datasets, sorting, sub-setting, and producing reports and descriptive statistics.

NST 779. Statistical Modeling I - Linear Models. 3 Hours.
This course is designed as a survey course on the application of General Linear Models and Logistic Regression, with emphasis on health-related problems. These techniques are covered in detail including appropriate diagnostic and remedial measures.
Prerequisites: NST 758 [Min Grade: B]

NST 780. Statistical Model II - Topics in Multivariate Analysis. 3 Hours.
This course will extend concepts introduced in NST 779: Statistical Modeling I - Linear Models into multivariate applications. This course is designed as a survey course on the application of common multivariate methods, with emphasis on health-related data.
Prerequisites: NST 779 [Min Grade: B]

NTC-Nursing - Teaching Courses

NTC 618L. Focus on Advanced Nursing Practice Specialization. 2 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: (NUR 606 [Min Grade: B] or NUR 606 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B])

NTC 650. Instructional Strategies For Teaching in Nursing. 3 Hours.
This course is required for students in the Teacher in Nursing Certificate program and maybe chosen as an elective course by other graduate students. The content is general and applicable to a variety of teaching situations and learners. The course is an introduction to a systematic approach to developing and implementing adult learning experiences. This course emphasizes the application of a systematic approach (assessing, planning, implementing, and evaluating) to the design of an educational unit. The focus will be on assessing learning needs, identifying learning objectives, selection of resources, and development of teaching strategies for different learner populations.

NTC 652. Program and Curriculum Development. 3 Hours.
This course is a required for students in the Teaching Nursing Certificate program and may be chosen as an elective course by other graduate students. The content is general and applicable to course, educational program, and/or curriculum development. The course is an introduction to the educational development process. This course emphasizes the basic components of program/curriculum development, philosophy, goals, planning learning experiences, implementing learning experiences, and evaluation of the curriculum or an educational program. The focus is on an understanding of program/curriculum determinants (learning, knowledge, man, society) and their impact on curriculum and educational program planning. The impact of philosophy, organizing framework, goals, learning experiences, and evaluation on curricular and program design and development will be discussed.

NTC 654. Evaluation of Instruction in Nursing. 3 Hours.
This course is a required for students in the Teacher in Nursing Certificate program and may be chosen as an elective course by other graduate students. The content is general and applicable to a variety of health related educational settings and learners. This course is an introduction to educational testing and measurement, teaching effectiveness, and clinical performance appraisal. This course provides an overview of evaluation techniques that enable nurses to plan and implement a variety of education related evaluation approaches, including test construction, item analysis, teaching effectiveness, and clinical performance appraisals. Emphasis will be placed on classroom and clinical evaluation of learning and on the use of technology for evaluation purposes. Prereq: Admission to Graduate Studies in the School of Nursing or as a non-degree post-baccalaureate student or by permission of instructor;knowledge of statistics and writing measurable educational ofjectives int eh domains of knowledge, skills, and attitudes.

NTC 656. WebCT for Instructors and Designers. 3 Hours.
Provides students with an advanced level of skill and knowledge of WebCT. Students are introduced to WebCT tools in a sequence that will permit development of a new course using WebCT as a learning management system.This course is offered only when sufficient interest by students is generated.

NTC 658. Simulation and Classroom Technologies for Student Learning. 2-3 Hours.
Designed to introduce graduate nursing students to the use of technology and simulation in nursing education. Students will be introduced to simulationas an educational strategy addressing issues related to the development implementation and evaluation of simulations. The use of technology available to enhance the educational environment will also be explored. Students will analyze advantages and disadvantages of various technologies and determine appropriate application of these technologies.

NTC 660. Foundations of Evidence-Based Nursing Education. 3 Hours.
Designed to prepare graduate nursing students to understand the concepts fundamental to nursing education. Students will be expected to analyze the effects of student and faculty diversity, legal and ethical issues, evidence-based practice on nursing education.

NTC 683L. Teaching Practicum in Nursing. 1-3 Hour.
This course is a required practicum for students in the Teacher in Nursing Certificate program and may be taken as an elective course by other graduate students who are concurrently enrolled in one or more NTC courses. The practicum provides an opportunity for students to concurrently or retrospectively implement the knowledge and skills acquired in NTC 650, NTC 652, and NTC 654 to selected teaching (classroom and clinical) situations. This course provides opportunities for students to integrate previously or concurrently acquired knowledge concerning teaching, curriculum, and/or evaluation into selected classroom and clinical situations. This practicum course allows students to assume limited responsibilities in classroom and clinical teaching while under the guidance of an instructor and/or preceptor. Students will be expected to meet all the course objectives upon completion of the three credit hour practicum. The practicum should involve both didactic and clinical teaching.Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: Admission to Graduate Studies in the School of Nursing or as a non-degree post-baccalaureate student. Prerequisite: NTC 650, NTC 652, and NTC 654.
Prerequisites: NTC 650 [Min Grade: B] and NTC 660 [Min Grade: B] and NTC 658 [Min Grade: B] and NTC 652 [Min Grade: B] and NTC 654 [Min Grade: B]

NTC 687. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the student's knowledge base.

NTC 692L. Residency: Nurse Educator. 3-6 Hours.
A comprehensive examination is given during this residency course. Failure to pass the comprehensive examination will delay graduation. Students arrange their own clinical sites with assistance/approval from clinical faculty. Prerequisite: NTC 650, NTC 652 and NTC 654.
Prerequisites: (NTC 650 [Min Grade: B] or NTC 650 [Min Grade: B]) and (NTC 652 [Min Grade: B] or NTC 652 [Min Grade: B]) and (NTC 654 [Min Grade: B] or NTC 654 [Min Grade: B])

NTC 760. Transitions to Academic Nursing Education. 3 Hours.
This course provides content relevant to the role of the nurse educator in an academic setting. The course includes information on nurse educator competencies, trends in higher education, the nature of our students in the 21st century, and strategies for building a successful nurse-educator career, including building collegial relationships and integrating the teaching, research, and service missions of the university into one position. This course may be included in a program of study as an elective, or taken as a non-degree student. NTC 760 may also be taken by students in the Nurse Educator track in the MSN program.

NUR-Nursing Courses

NUR 519. Evidence-Based Nursing & Health Care Technology. 4 Hours.
The purpose of this course is to prepare students to translate current evidence, identify existing gaps, and use technology to improve care outcomes. The focus is on the knowledge and skills needed to deliver and coordinate care across multiple settings, apply research outcomes, resolve practice problems, and disseminate results. The emphasis is on leading continuous improvement processes individually or through an inter-professional team, implementing evidence-based practice and determining the appropriate technology to support evidence based care and health education.
Prerequisites: NUR 556 [Min Grade: C] and NUR 537L [Min Grade: P] and NUR 538 [Min Grade: C] and NUR 553L [Min Grade: P]

NUR 520. Foundational Competencies for the Professional Nurse. 3 Hours.
The purpose of this course is to introduce fundamental nursing concepts and processes of professional nursing that assist in providing safe, quality nursing care to clients and their families. The course focuses on the role of the nurse as a caregiver and educator of individuals and groups from diverse populations. Emphasis is on the professional attributes of the generalist nurse, legal and ethical implications for nursing practice, and beginning care competencies of the professional nurse.

NUR 521L. Foundational Skills for the Professional Nurse. 3 Hours.
The purpose of this course is to introduce fundamental nursing skills and professional behaviors needed to provide safer, quality patient/family centered nursing care to clients within diverse settings and communities. The focus is on applying the nursing process and developing clinical judgment and reasoning skills, emphasis is on clinical competencies including health assessment and history taking, foundational clinical nursing skills, basic nursing care for adult clients, and nursing documentation.

NUR 522. Mental Health Nursing. 3 Hours.
The purpose of this course is to introduce concepts of mental health and psychiatric illness throughout the lifespan with consideration given to therapeutic communication and evidence-based nursing interventions for clients and their families. The course focuses on the use of critical thinking and clinical decision-making skills in the promotion, maintenance and restoration of optimum mental health of vulnerable individuals and families. Emphasis is placed on the independent and collaborative roles of nursing in identifying risk factors for mental disorders, assessing mental health status, and designing and implementing psychobiological and psychosocial interventions associated with expected therapeutic outcomes.

NUR 524. Pharmacology for AMNP. 3 Hours.
The purpose of this course is to increase understanding of pharmacologic concepts needed by the generalist nurse. The course focuses on preparing the generalist nurse to apply acute pharmacological concepts in clinical practice and deliver safe, effective administration of medications. The emphasis of the course is a systematic overview of pharmacological concepts, pharmacokinetics, and pharmacodynamics.

NUR 526. Adult Health Nursing I: Managing Chronic and Episodic Health Conditions. 2 Hours.
The purpose of this course is to introduce concepts and processes needed to provide safe, quality family-centered nursing care to adults. The course focuses on the practice of professional nursing as an evidence-based, goal-directed activity designed to assist adult clients in achieving optimal health by meeting basic human needs, providing holistic care, and engaging in health promotion and disease/injury prevention strategies. Emphasis is on the individual and collaborative roles of nursing to identify risk factors, assess health status of adults, and design, implement, and evaluate nursing interventions associated with expected therapeutic outcomes for chronic disease and episodic health conditions such as heart disease, hypertension, type 2 diabetes, obesity, and arthritis.

NUR 527L. Nursing Practicum with Adults I. 2 Hours.
The purpose of this course is to apply fundamental nursing skills and professional behaviors needed to provide safe, quality client/family centered nursing care. The focus is on applying the nursing process and developing clinical judgment and reasoning skills with adult clients form diverse backgrounds and communities. Emphasis is on developing clinical competencies including health assessment and history taking, foundational clinical nursing skills, basic nursing care for adult clients, and nursing documentation.

NUR 528. Pathophysiology for AMNP. 2 Hours.
The purpose of this course sis to increase understanding of pathophysiological concepts/ processes needed to provide safe, quality client/family centered nursing care across the lifespan. The course focuses on preparing the generalist nurse to apply [pathophysiological concepts in clinical practice. The emphasis is on a systematic study of pathophysiological concepts/processes associated with cellular injury and genetics; alterations in fluid and electrolytes, acid base balance, immunity, inflammation, and metabolism; and a basic introduction to oxygenation and perfusion.

NUR 533. Spirituality in Health Care. 3 Hours.
This course will focus on spirituality, including a greater understanding of different spiritual traditions, personal spiritual development, and the incorporation of spirituality into professional practice. The content will examine spirituality and health from the perspective of the major world religions and spiritual practices. The impact of spirituality on illness and healing will be examined. Spiritual care, including assessment and selected interventions, legal and ethical issues will be discussed with respect to individuals and families of varying developmental stages, socio-cultural backgrounds, and life situations. Students will be challenged to explore their own spirituality and its impact on their personal and professional lives. A foundation in computer utilization and accessing resources through use of the internet is strongly recommended.

NUR 534. Living With Loss. 3 Hours.
This course includes loss, grief, body-image changes, loss due to chronic conditions, and loss of life in childhood and adulthood explored from the viewpoint of a health-care professional.

NUR 537L. Nursing Practicum with Adults II. 3 Hours.
The purpose of this course is to apply nursing clinical skills and professional behaviors needed to provide safe, quality client/family centered nursing care in acute care settings for adult clients from diverse backgrounds and communities. The focus is on applying the nursing process and using clinical judgment and reasoning skills in acute care situations. Emphasis is on increasing competency in the design, coordination, and evaluation of client/family centered care of adults with acute disease or injury associated conditions.
Prerequisites: NUR 520 [Min Grade: C] and NUR 526 [Min Grade: C] and NUR 524 [Min Grade: C] and NUR 528 [Min Grade: C] and NUR 522 [Min Grade: C]

NUR 538. Pathophysiology for AMNP II. 2 Hours.
The purpose of this course is to increase understanding of pathophysiological concepts/processes needed to provide safe, quality client/family centered nursing care across the lifespan. The course focuses on preparing the generalist nurse to apply acute pathophysiological concepts in clinical practice. The emphasis of the course is a systematic study of pathophysiological concepts/processes associated with alterations in fluid and electrolytes, perfusion, oxygenation, intracranial regulation, metabolism, and infection.
Prerequisites: NUR 520 [Min Grade: C] and NUR 524 [Min Grade: C] and NUR 528 [Min Grade: C] and NUR 522 [Min Grade: C]

NUR 542. Health Promotion, Prevention, Populations, and Policy. 3 Hours.
The purpose of this course is to prepare the generalist nurse to lead population focused health promotion and prevention initiatives that address national and global health issues. The focus is on health hazards, social determinants, and regulatory, legal, and ethical issues that affect population health. Emphasis is on analyzing current data and best evidence to advocate through policy change for improved health status of individuals. Communities and diverse populations.
Prerequisites: NUR 520 [Min Grade: C] and NUR 526 [Min Grade: C] and NUR 524 [Min Grade: C] and NUR 528 [Min Grade: C] and NUR 522 [Min Grade: C]

NUR 546. Adult Health Nursing III: Managing Complex Health Conditions. 2 Hours.
The purpose of this course is to expand the knowledge of concepts and processes needed to provide safe, quality family-centered nursing care to adults with complex health conditions. The course focuses on the practice of professional nursing as an evidence-based, goal-directed activity designed to assist adult clients in achieving optimal health by meeting basic human needs, providing holistic care and engaging in health promotion and disease/injury prevention strategies. Emphasis is on the individual and collaborative roles in nursing used to identify risk factors for complex health conditions: assess health status of adults: and design implement, and evaluate nursing interventions associated with expected therapeutic outcomes associated with life-threatening cardiac conditions, traumatic injuries, immunodeficiency, and neurological events.

Prerequisites: NUR 556 [Min Grade: C] and NUR 552 [Min Grade: C] and NUR 538 [Min Grade: C] and NUR 542 [Min Grade: C]

NUR 547L. Nursing Practicum with Adults III. 1 Hour.
The purpose of this course is to apply nursing clinical skills and professional behaviors needed to provide safe, quality client/family centered nursing care in acute care settings for clients from diverse backgrounds and communities. The focus is on applying the nursing process and using clinical judgement and reasoning skills in client care situations with increasing complexity. Emphasis is on increasing competency in the design, coordination, and evaluation of client/family centered care and therapeutic outcomes for adults with complex disease and traumatic injury conditions.
Prerequisites: NUR 556 [Min Grade: C] and NUR 552 [Min Grade: C] and NUR 538 [Min Grade: C] and NUR 542 [Min Grade: C]

NUR 549. Synthesis Review Course. 1 Hour.
The purpose of this course is to prepare the student to successfully complete the NCLEX examination. The course focuses on all professional nursing roles. Emphasis is on the synthesis of knowledge from all nursing courses as well as humanities, and the social, behavioral, and natural sciences.

NUR 550. Professional Leadership and Role Transition. 4 Hours.
The purpose of this course is to expend the knowledge of concepts, processes, and strategies of leader and change agent needed to transition into the professional nurse role within the healthcare team and profession as a generalist nurse. The course focuses on evidence-based, goal-directed activities designed to control health care costs and promote continuous quality improvement for the individual and collaborative nursing roles used to identify hazards with the healthcare environment that create risks to health and safety, to enact evidence-based “nurse-sensitive” quality improvement processes, and to evaluate healthcare outcomes from a systems and financial perspective.
Prerequisites: NUR 556 [Min Grade: C] and NUR 552 [Min Grade: C] and NUR 538 [Min Grade: C] and NUR 542 [Min Grade: C]

NUR 551L. Nursing Practicum with Vulnerable Populations. 2 Hours.
The purpose of this course is to implement therapeutic communication and safe, quality, family-centered nursing acre to individuals and groups among vulnerable populations in diverse healthcare and community settings. Focus is on developing roles of the generalist nurse in population health care as clinician, educator, health counselor, advocate, and care manager. Emphasis is on the professional attributes and nursing skills concerning legal, regulatory, ethical, and cultural implications for health promotion, illness and injury prevention, health maintenance, emergency preparedness, and coordination of health care across the lifespan for vulnerable populations.
Prerequisites: NUR 556 [Min Grade: C] and NUR 552 [Min Grade: C] and NUR 538 [Min Grade: C] and NUR 542 [Min Grade: C]

NUR 552. Nursing Care of Woman and Children. 4 Hours.
The purpose of this course is to obtain knowledge and skills to provide safe, quality client/family centered nursing acre to women across the lifespan with special attention given to women of childbearing age and children. The course focuses on the practice of professional nursing as an evidence-based, goal-directed activity to assist clients to achieve optimal health, meet basic human needs, provide holistic care, and engage in health promotion and disease/injury prevention strategies. Emphasis is on the individual and collaborative roles of nursing to identify risk factors, assess health status, and design, implement, and evaluate nursing interventions to obtain therapeutic outcomes for neonates, infants, children, adolescents, and women across the lifespan in diverse family and care settings.
Prerequisites: NUR 520 [Min Grade: C] and NUR 526 [Min Grade: C] and NUR 524 [Min Grade: C] and NUR 528 [Min Grade: C] and NUR 522 [Min Grade: C]

NUR 553L. Nursing Practicum with Women and Children. 2 Hours.
The purpose of this course is to apply nursing clinical skills and professional behaviors needed to provide safe, quality client/family centered nursing to women and children from diverse backgrounds and communities. The focus is on applying the nursing process, using clinical judgment and reasoning skills in health care situations, and promoting health and preventing disease/injury among women and children. Emphasis is on increasing competency in the design, coordination, and evaluation of client/family centered care for this population.
Prerequisites: NUR 520 [Min Grade: C] and NUR 526 [Min Grade: C] and NUR 524 [Min Grade: C] and NUR 528 [Min Grade: C] and NUR 522 [Min Grade: C]

NUR 556. Adult Health Nursing II: Managing Acute Health Conditions. 4 Hours.
The purpose of this course is to obtain knowledge and skills to provide safe, quality client-family centered nursing care to adults with acute health problems. The course focuses on the practice of professional nursing as an evidence-based, goal-directed activity to assist adults achieve optimal health, meet basic human needs, provide holistic care, and engage in health promotion and disease/injury prevention strategies. Emphasis is on the individual and collaborative roles of nursing to identity risk factors, assess health status, and design, implement, and evaluate nursing interventions to obtain therapeutic outcomes for conditions such as myocardial infarction, stroke, acute renal failure, and exacerbations of respiratory and metabolic disorders.
Prerequisites: NUR 520 [Min Grade: C] and NUR 526 [Min Grade: C] and NUR 524 [Min Grade: C] and NUR 528 [Min Grade: C] and NUR 522 [Min Grade: C]

NUR 557. Leadership and Management in Professional Nursing for RNs. 3 Hours.
This course focuses on leadership and management theories and models, resource allocation and management, delegation, conflict resolution, legal implications of practice, managed care, evaluation of practice, continuous quality improvement, healthcare systems, and contemporary issues in the workplace. Emphasis is placed on the integration of all professional role behaviors, application of research, and leadership/management skills. For students enrolled in 557, this course is a transition course into the RN-MSN option for baccalaureate degree RN Mobility students. Evaluation methods for the course will be different from those used for students enrolled in NUR 457.
Prerequisites: NUR 574 [Min Grade: C](Can be taken Concurrently) and NUR 597 [Min Grade: C](Can be taken Concurrently)

NUR 558L. Clinical Synthesis and Role Immersion. 5 Hours.
The purpose of this course is the synthesis and assimilation of skills and nursing content from all previous courses and is intended to prepare students to function independently in the roles of the generalist nurse. The focus of the course is on the professional roles of direct caregiver, health policy advocate, translator/integrator of nursing scholarship, interprofessional team collaborator, nursing practice innovator, and leader of organizations and systems. The course emphasizes independent nursing practice as a generalist nurse under the supervision of a nursing preceptor, involvement in organizational/systems leadership, and application of best evidence to deliver safe, quality, client/family centered care.
Prerequisites: NUR 556 [Min Grade: C] and NUR 552 [Min Grade: C] and NUR 538 [Min Grade: C] and NUR 542 [Min Grade: C]

NUR 559L. Concepts of Transitional Care Coordination. 4 Hours.
The purpose of this course is to apply nursing knowledge and skills to promote safe, quality patient care in a variety of transitional care settings across the lifespan. The focus of this course will be to apply concepts of care coordination and transitional care in order to focus on achieving the outcomes of increasing access to care, preventing hospital readmissions, and promoting innovative, cost-effective, quality care for highly vulnerable and/or chronically ill clients during critical transitions. Emphasis will be upon coordination and promotion of care continuity within, between and across settings, as well as between providers. Additionally, emphasis will be placed on identification of required community resources, development of a mutually-agreeable plan of care with the client, coordination of care with all providers, the time-limited nature of transitional care services, client, family and caregiver education, identifying root causes of poor health outcomes, avoiding hospital readmissions and promoting optimal client outcomes.

NUR 574. Transition to Professional Nursing Practice for RNs. 4 Hours.
Using an online format, this course is designed to enhance the registered nurse's knowledge of the role of the professional nurse in meeting the healthier needs of society. Historical, legal, political, and ethical issues affecting the profession will be examined. The relationship between selected issues, trends, and theories and professional nursing practice will be analyzed. Students will examine behaviors related to various roles of the professional nurse, including caregiver, teacher, advocate, research consumer, and counselor. Additionally, this course addresses communication skills necessary to a professional nurse including writing and computer literacy. For students enrolled in NUR 574, this course is a transition course into the RN-MSN option for post-baccalaureate degree RN Mobility students.

NUR 587. Supplemental Academic Course for Support (SACS). 1-3 Hour.
The purpose of this distance-accessible course is to introduce a structured format for students to review nursing concepts and processes related to a specific patient population. The course focuses on the role of the nurse as caregiver. Emphasis is on test-taking strategies and the review of didactic content to strengthen the student's knowledge base.

NUR 596. Didactic Independent Study for Delayed Progression. 1 Hour.
The purpose of this course is to augment knowledge gained in nursing courses related to test taking, delegation, prioritization and critical thinking. The course focuses on the role of the nurse as caregiver, manager, collaborator, and education. Emphasis is on the nursing care and management of young, middle-age, and older adults.

NUR 597. Community and Public Health Nursing for RNs. 4 Hours.
This course is designed for RN students to build on existing clinical expertise and knowledge, broaden exposure to different roles of the professional nurse in the areas of community and public health, and apply knowledge learned throughout the BSN curriculum to meet the needs of population aggregates. Emphasis is on professional nurse role development focused on illness and injury prevention, health promotion, health education, public health preparedness and advocacy for population aggregates across the life span. For students enrolled in NUR 597, this course is a transition course into the RN-MSN option for post-baccalaureate degree RN Mobility students.
Prerequisites: NUR 574 [Min Grade: C](Can be taken Concurrently)

NUR 600. Research and Statistics for Advanced Practice. 4 Hours.
This course is designed to prepare master¿s students with the research knowledge and skills to (1) use current research findings to improve practice, (2) use the process of research to examine questions identified in nursing practice, and (3) participate in collaborative research. This course will include integration of the following elements: critical thinking, current technologies for data management and statistical analysis, scholarly writing, scientific integrity and ethics and human diversity. Statistical procedures examined will include univariate and bivariate statistics, parametric and nonparametic procedures and selected epidemiological measures. Prerequisite: Under-graduate statistics.
Prerequisites: NUST A or MA 180 [Min Grade: C] or PY 214 [Min Grade: C] or MA 480 [Min Grade: C] or QM 214 [Min Grade: C] or JS 120 [Min Grade: C] or (NUR 517 [Min Grade: C] and NUR 518L [Min Grade: P])

NUR 601. Role Development for Advanced Nursing Practice. 3 Hours.
This course is designed to prepare graduate nursing students to understand the concepts of advanced nursing practice and advanced practice nursing. Students will be expected to differentiate between advanced nursing practice and the practice of other nurses and health care providers. Concepts from a variety of models and theories from nursing and other disciplines will be discussed, and examples of how these concepts may be applied in advanced nursing practice will be offered. The concept of cultural competence will be explored as will its application when interacting with people from diverse ethnic and racial groups.

NUR 602. Issues Affecting Advanced Nursing Practice. 3 Hours.
This course prepares graduate nursing students to incorporate management and leadership skills in the practice arena. The health care environment and culture, selected organizational, economic, and financial theories, strategic planning, change theory, health care marketing and information and quality management will be explored in the context of contemporary issues such as bioterrorism and health care policy and regulation. This course will also include integration of the following elements: critical thinking, scholarly writing, research, theory evaluation and application, scientific integrity and ethics, human diversity and social issues.

NUR 603. Primary Health Care in Low Resource Countries. 3 Hours.
This course is designed for the Advanced Health Care Provider who plans to deliver primary health care in countries considered to be low resource areas as designated by the World Health Organization. These students will study the epidemiology, pathophysiology, diagnosis, and management of infectious and parasitic diseases throughout the global community. In addition, nutritional deficiencies and obstetric problems will be reviewed. Emphasis will be placed on those health problems which are not common in high resource countries. Implementation of the World Health Organization's Integrated Management standards will be included in the study of each disease as they apply to adults adolescents, and children. Potential personal safety issues for world travelers, and information designed to alleviate these issues will be studied. Each student will focus on a specific country or global area for a more in-depth learning experience.

NUR 604. Leadership in Advanced Nursing Practice Roles. 3 Hours.
The purpose of this course is to provide students with the foundation for an in-depth understanding of advanced nursing practice leadership. The focus of the course is on the principles and standards of advanced nursing practice. The emphasis of the course is on inter-professional collaboration in healthcare.

NUR 605. Research for Evidence-Based Practice. 3 Hours.
This core course is designed to prepare master¿s nursing students with the research knowledge and skills to (1) use current research findings to improve practice, (2) use the process of research to examine questions identified in one's own nursing practice, (3) develop an evidence-based advanced nursing practice, and (4) contribute to expansion of nursing's knowledge base. This course will also include integration of the following elements and/or activities: critical thinking, informatics, current technologies for data management and statistical analysis, collaboration, scholarly writing, preparing/giving professional presentations, theory evaluation and application, scientific integrity and ethics, human diversity, and social issues. The advanced-practice role emphasis of this course is that of investigator, research collaborator, and content expert in a selected practice field. A graduate course in inferential statistics and a solid foundation in computer utilization and accessing scientific sources by internet is required.

NUR 606. Translating Evidence into Practice. 3 Hours.
The purpose of this course is to provide students with the knowledge and skills to evaluate and interpret evidence that supports application in practice. The focus of the course will be on the management and analysis of health care evidence and translation for practice. The emphasis of the course will be on evidence-based practice, safety and quality, informatics, emerging technologies, data management, applied statistics, evaluation and trend analysis.
Prerequisites: (NUR 604 [Min Grade: B] or NUR 604 [Min Grade: B] or NUR 737 [Min Grade: B]) or (NUR 612 [Min Grade: B] or NUR 612 [Min Grade: B]) and (MA 180 [Min Grade: C] or MA 480 [Min Grade: C] or PY 214 [Min Grade: C] or PY 216 [Min Grade: C] or QM 214 [Min Grade: C] or JS 120 [Min Grade: C] or NUST A) or (NUR 517 [Min Grade: C] and NUR 518L [Min Grade: P])

NUR 607. Interprofessional Global Health Service Learning I. 1 Hour.
This course provides students with an opportunity to apply principles of interprofessional collaboration, community partnerships,and global health in the development of a plan to address a global health problem in collaboration with a community partner. Students apply concepts and theories related to global health, interprofessional collaboration, team building, community partnerships, and the ecological framework developing a plan to address a specific global health problem with a community partner. The course focuses on planning a service learning project that will benefit a community partner. The project is planned and carried through by an interprofessional team. The course is primarily experiential, with students' time spent on planning the project and learning leadership and project planning skills.

NUR 608. Interprofessional Collaboration (IPC) and Community Partnerships in Global Health. 1 Hour.
This course provides students with an understanding of principles of interprofessional collaboration and community partnerships that, together with key social and economic concepts of global health, enables them to participate in developing and implementing sustainable global health projects in collaboration with local and international community partners. Working in interdisciplinary teams, students apply concepts and theories related to global health, interprofessional collaboration, team building, community partnerships, and the socioecological framework to develop a plan to address a specific global health problem with a community partner.

NUR 609. Radiology for Advanced Practice. 3 Hours.
This course provides nurse practitioners and other mid-level providers with an introduction to radiography. The course provides the novice the opportunity to incorporate radiographic studies into working through a differential diagnosis. The course utilizes various common radiographic techniques including plain films, computed tomography and magnetic resonance imaging.

NUR 610. Health Care Systems for Advanced Nursing Practice. 3 Hours.
The purpose of this course is to provide students an opportunity to evaluate health care systems that influence advanced nursing practice. The focus of the course is on organizational theories of business practice and health care economics. The emphasis of the course is on the incorporation of business, legal, political, and organizational concepts in advanced nursing practice.
Prerequisites: (NUR 606 [Min Grade: B] or NUR 729 [Min Grade: B] (Can be taken Concurrently) and (NUR 604 [Min Grade: B] or NUR 737 [Min Grade: B](Can be taken Concurrently) and (NWH 618L [Min Grade: P] or NPN 618L [Min Grade: P] or NNE 618L [Min Grade: P] or NFH 618L [Min Grade: P] or NPE 618L [Min Grade: P] or NDP 618L [Min Grade: P] or NAH 618L [Min Grade: P] or NCA 618L [Min Grade: P] or NCC 618L [Min Grade: P] or NCL 618L [Min Grade: P](Can be taken Concurrently)

NUR 611. Management of Diabetes Mellitus (Type 1 and 2). 3 Hours.
This course will provide a multi-disciplinary framework for the identification of those at risk or who already possess the metabolic syndrome, frank type 2 diabetes mellitus and its complications. A variety of management strategies will be presented from the perspectives of multiple healthcare disciplines. The perspectives of the multi-disciplinary team in assisting persons to achieve self-care goals are an important theme throughout this course as are the current controversies, issues and research findings underlying present approaches to treatment and patient/family education.

NUR 612. Advanced Pathophysiology. 3 Hours.
The purpose of this course is to provide the student with an opportunity to build upon existing knowledge of basic physiology. The focus of this course is on the analysis and application of principles of anatomy and physiology. The emphasis is placed on the use of critical thinking to apply physiologic principles in explaining adaptations to pathogenic changes in the systems across the lifespan.
Prerequisites: NUR 604 [Min Grade: B](Can be taken Concurrently) or NHSL 604 [Min Grade: B](Can be taken Concurrently) or NUR 737 [Min Grade: B](Can be taken Concurrently)

NUR 613. Pharmacology and Therapeutics. 3 Hours.
The purpose of this course is to plan, implement, and evaluate therapeutic pharmacological interventions. The focus of this course is on the analysis and use of principles of pharmacology, pharmacodynamic, and pharmacokinetics. The emphasis is on characteristics of special populations related to therapeutic needs, as well as drug absorption, metabolism, and excretion.
Prerequisites: NUR 606 [Min Grade: B](Can be taken Concurrently) or NUR 606 [Min Grade: B](Can be taken Concurrently) or NHSL 606 [Min Grade: B](Can be taken Concurrently) or NHSL 606 [Min Grade: B] (Can be taken Concurrently) or NUR 737 [Min Grade: B](Can be taken Concurrently) and NUR 612 [Min Grade: B](Can be taken Concurrently)

NUR 614. Assessment and Diagnostic Reasoning for Advanced Nursing Practice. 3 Hours.
The purpose of this course is designed to provide students with an advanced level of skill and knowledge in critical thinking and diagnostic reasoning. The focus is on conducting health assessments and planning care for patients across the lifespan. The emphasis of this course is on the integration of critical thinking, scientific ethics, human diversity, as well as the recognition of social issues in the care of and presentation of patients.
Prerequisites: NUR 612 [Min Grade: B](Can be taken Concurrently) and NUR 613 [Min Grade: B](Can be taken Concurrently) and NA 720 [Min Grade: B](Can be taken Concurrently) or NUR 604 [Min Grade: B] (Can be taken Concurrently) or NUR 737 [Min Grade: B](Can be taken Concurrently) and NUR 606 [Min Grade: B](Can be taken Concurrently) or NHSL 606 [Min Grade: B] or NUR 729 [Min Grade: B](Can be taken Concurrently) or NA 733 [Min Grade: B])

NUR 614L. Assessment and Diagnostic Reasoning for Advanced Nursing Practice. 3 Hours.
This course is designed to provide students with an advanced level of skill and knowledge in critical thinking and diagnostic reasoning for conducting health assessments and planning care for holistic, adaptive human beings. The following elements are integrated into the course: professional presentations, critical thinking, scientific integrity and ethics, human diversity, and social issues.Pre or corequisite: NUR 612.
Prerequisites: NUR 612 [Min Grade: B](Can be taken Concurrently) or NUR 612 [Min Grade: B](Can be taken Concurrently)

NUR 615. Sexuality Issues in Health and Illness: A Lifespan Approach. 3 Hours.
This course includes the ethical, social, biological, and psychological concepts of human sexuality.

NUR 616L. Focus on Advanced Nursing Practice Specialization. 2 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: (NUR 606 [Min Grade: B] or NUR 606 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B])

NUR 617. Interprofessional Ethical Issues in Clinical Genetics. 2 Hours.
This course will incorporate basic knowledge of clinical genetics and build knowledge of ethical and legal issues related to genetics. The course focuses on interprofessional collaboration and team development of solutions and approaches for cases from clinical practice. Examination of clinical genetic competencies according to professional standards is highlighted.

NUR 618L. Clinical Diagnostic Reasoning. 4 Hours.
A modular organ system approach utilizing case studies will be used to pull together basic principles from pathophysiology, pharmacology and physical/health assessment to develop clinical diagnostic reasoning skills necessary for the nurse practitioner. This course is designed to provide students with an advanced level of skill and knowledge in critical thinking and diagnostic reasoning to apply in the subsequent clinical nursing courses. Students will utilize the knowledge and skills learned in NUR 618QL as they diagnose and manage the care of clients with acute, chronic, and episodic health problems throughout the life span.

NUR 619. Health Issues in Culturally Diverse Populations in the United States. 3 Hours.
This course provides students with an overview of health issues and health disparities confronting culturally diverse populations in the United States. The course also addresses genetic, cultural, historical and demographic factors that influence these health issues and disparities, implications for culturally effective health care, and for development of health policy.

NUR 620. Social Responsibility in Global Health. 1 Hour.
This course provides students with an understanding of key social and economic concepts of global health that, together with an understanding of interprofessional collaboration and community partnerships, will enable them to participate in developing and implementing sustainable global health projects in collaboration with local and international community partners. The course is open to undergraduate and graduate students who are enrolled in two co-requisite courses that are requirements for students participating in the interprofessional global health service learning program at the University of Alabama at Birmingham. Working in interdisciplinary teams, students apply concepts and theories related to global health, interprofessional collaboration, team building, community partnerships, and the socioecological framework to develop a plan to address a specific global health problem with a community partner.

NUR 625. Concepts of Addiction Across the Lifespan. 3 Hours.
The purpose of this course is to explore the concept of substance use, misuse and addiction across the lifespan from a nursing perspective. The course will focus on exploring substance use, misuse and addictions nursing, and will include: the epidemiology of substance use, misuse and addiction, a review of addictive substances and medications, an overview of the pathophysiological effects of substance use, misuse, addiction, and overdose, pertinent legislation, and the impact of substance use, misuse and addiction on the professional registered nurse. Emphasis will be placed upon the nurse's role in screening, brief intervention, and referral to treatment for patients across the lifespan experiencing substance use, misuse, and addiction.

NUR 628. Men's Health Across the Lifespan. 3 Hours.
The purpose of this course is to provide an expansion of knowledge of health related issues for the pre-adolescent, adolescent, adult, and aging male population. The focus of this course is on physiologic and psychologic development, age related health complications, emotional challenges of adolescence, social determinants of health, policy, sexual health and related issues, and complications specific to aging males. The emphasis of the course is on promoting the progression of knowledge of health related issues of the male population.

NUR 630. Principles of Epidemiology. 3 Hours.
This course is intended to provide the advanced practice nurse with a working knowledge of epidemiology and biostatistics as they relate to nursing practice. Additionally, phenomena along the wellness continuum will be discussed. The Natural History of Disease Model will be applied to the study of health and illness in human populations.
Prerequisites: NUR 600 [Min Grade: C]

NUR 633. Growth and Development. 3 Hours.
The content of this course is centered on major theories of development including physiological, psychoanalytic, social, stimulus-response, cognitive and moral. Current areas and findings of research are investigated and research designs and methods are critiqued. Self-selected in depth studies are made and shared. Contributions of the study of development to the functional practice of nursing are demonstrated.

NUR 634. Perspectives in Global Health Leadership. 3 Hours.
This course is designed to provide students with an understanding of global aspects of health care leadership. The course will focus on identification of characteristics of global health care leaders, leadership theories, and strategies to develop one's own personal leadership abilities. The course will provide students with a unique opportunity to interact with health care leaders from countries around the world, and develop projects related to an aspect of global health care leadership of interest to each student.

NUR 637. Genetic Principles and Issues. 3 Hours.

NUR 639. Complementary Therapies and Integrative Hlth Care. 3 Hours.
The focus of this elective course is on holistic nursing utilizing complementary and alternative therapies and integrative health care as an emerging paradigm in the health care arena. This course will examine both the concepts of integrative health care and major complementary therapies, including theoretical basis and research support, actions, uses, contraindications, and side effects. The socio-cultural, economic, legal and ethical issues associated with complementary therapies will be included as well as standards for practice and available resources. Students will be encouraged to explore ways in which they can counsel patients regarding complementary therapies as well as potential inclusion of the therapies in their own practice.

NUR 641. Herbals and Nutritional Supplements. 3 Hours.

NUR 642. Health Education and Social Welfare in a Global Community. 3 Hours.
The purpose of this course is to provide students with a cross-cultural experience in which they will spend time in a selected global community while learning about health, educational and social welfare issues. Students will participate in pre-trip seminar in Birmingham or on-line prior to travel. The seminar(s) will focus on an overview of the course, a model of assessing culture and an overview of selected global community's culture. Students will also participate in seminars on a variety of health, education and social welfare topics provided by the course instructor and by resource persons from the selected global community.

NUR 643. Introduction to Nursing Informatics. 3 Hours.
The organizing framework for this course is based on the three concepts that form the theoretical basis of nursing informatics, data, information and knowledge. Students will explore how data can be organized into information for the generation of knowledge through the design, selection and implementation of clinical information systems. The course has two sections: theory and laboratory. The theoretical content will focus on the collection, organization, analysis and dissemination of information in nursing and healthcare. Laboratory work will familiarize the student with computer applications designed to manage nursing and healthcare information.

NUR 644. Principles of Developmental Care Newborn Infants. 3 Hours.
Provides students with an overview of principles of individualized developmental care for newborns and infants. The course also addresses principles of family-centered care as a key component of developmental care. Students review concepts and theories related to molecular biology, fetal, infant and family development, psychology and sociology in assessing and planning care to promote optimal development of high risk infants and families. Students explore roles of nurses and other interdisciplinary team members in developmental care are assessed, and develop plans to promote organizational change in order to incorporate developmental care principles in a clinical setting.

NUR 645. Sleep Across the Lifespan I. 3 Hours.
This course provides students with knowledge and skills required for: 1) screening, diagnosing, and treatment of adults (age 13 and beyond) with sleep disturbances and disorders, 2) understanding the articulation between physiologic, social, cultural, and environmental influences on sleep, sleep disturbances, and sleep disorders, 3) critical analysis of sleep, sleep disturbances and sleep disorders and how they relate to public policy, and law, 4) strategies for health promotion related to sleep, and 5) views of knowledge development, and scientific progress in sleep disturbances and disorders among diverse groups of adults.

NUR 653. A Glocal Health Approach to Health Promotion in the Rural South. 3 Hours.
The purpose of this course is to provide students with the knowledge, skills, and attitudes needed for global health competency development and apply global health principles to promote wellness in rural populations in the southern United States. The course focuses on the impact of the social determinants of health (SDOH) on outcomes and health disparities and draws parallels to similar rural populations in selected low- or middle-income countries. Emphasis is on the contributions of interprofessional health teams to address the complex issues that influence population health, health promotion, and health care delivery in low-resource rural settings.

NUR 667. Psychosocial Aspects of Evidence-Based Practice in Chronic Illness. 3 Hours.
This course is organized around the concepts of evidence-based practice, psychosocial nursing and chronic illness. The chronic illness trajectory across the individual s and family s life span and the needs of vulnerable populations with attention to disparity of care and cultural competence of involved health care providers is included. This course is designed to provide the undergraduate student with the basic knowledge and skills needed to provide evidence-based interventions and the graduate student to analyze needs for development of interventions to address the psychosocial needs of those with chronic illness.

NUR 670. Occupational Health Management Principles. 1 Hour.
This course provides the student with a working knowledge of management topics specific to planning, directing, and evaluating occupational health services.

NUR 671. Principles and Practice of Occupational Toxicology and Disease. 3 Hours.
This course is designed to provide the student with an opportunity to build upon existing knowledge of physiology and pathophysiology. Emphasis is placed on the use of critical thinking to assess risk, determine effects, and plan strategies to minimize effects of toxicant exposure and occupational diseases in worker populations.

NUR 673. Intervention Approaches to Family Violence Across the Lifespan. 3 Hours.
The purpose of this course is to provide an overview of contemporary issues in family violence in the US. This course focuses on intervention and prevention responses, best practices and public policy addressing family violence. Emphasis is placed on multidisciplinary responses to addressing the public health problem of family violence.

NUR 674. Evaluation and Management of Occupational Health and Safety Programs. 3 Hours.
The purpose of this course is to provide the occupational health student with a working knowledge of program planning and managerial processes in occupational settings. The focus is to prepare the student to actively explore factors that influence the delivery of occupational health and safety services. The emphasis will be on the decision-making processes related to financial management and resource allocation, along with management of health and safety programs.

NUR 674L. Evaluation and Management of Occupational Health and Safety Programs. 2 Hours.
The aim of NUR 674QL is to provide the occupational health student with a working knowledge of program planning and managerial processes in occupational settings. This graduate course is designed to give the master¿s student an opportunity to actively explore factors which influence the delivery of occupational health and safety services and to critically evaluate the role functions of managers of those services. Decision-making processes related to financial management and resource allocation, along with management of health and safety programs, will be emphasized. Planning for and implementing a worksite occupational health and safety intervention in industry at the aggregate level will be a major part of the course.

NUR 686. Honors Seminar III: Project Implementation. 3 Hours.
This required course for Honors Program students provides opportunities for implementation of an innovatie evidence-based practice strategy which integrates human responses to health and illness and professional practice roles. Course content includes clinical or research experiences in innovative practice approaches, discussions of implications for evidence-based practice and professional nursing roles, and guidelines for preparation of manuscript and presentations. Professional expectations include dissemination of findings through a public forum and collaboration with agencies for integration of findings into practice.

NUR 687. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the students' knowledge base.

NUR 690. Independent Study in Nursing. 1-6 Hour.
Course allows concentration on a selected topic of interest relevant to the Program of Studies.

NUR 691. Independent Study in Clinical Nursing. 1-6 Hour.
Course provides for clinical learning activities which are in addition to the activities in the regular clinical sequence of a given option. Students apply or test out theories and knowledge obtained in established or independent study theory courses.

NUR 692. Clinical Practicum in Genetics. 1-2 Hour.
Course provides students with the opportunity to apply concepts related to Genetic Principles and Issues in a clinical practicum experience. Students will work with an approved preceptor in a clinical site that provides genetic services to prenatal clients and in a site that serves children with known or suspected genetic disorders. Students will conduct genetic assessments, apply the nursing process to develop culturally-appropriate and ethical plans of care, participate as a member of an interdisciplinary team and use genetic counseling principles in interactions with families and children who have known or suspected genetic problems. Students will also implement an educational program related to genetics for nurses in a clinical or community setting.

NUR 693. Genetics In Modern Healthcare and Personalized Medicine. 2-3 Hours.
This elective for graduate students is an advanced study of genetics and genetic technologies which have revolutionized both healthcare and research. The goal of this course is to: (1) Enable students to understand the biology of genes and genetics and their role in healthcare, (2)Educate students on the role of genetic testing, sequencing, gene therapy, CRISPR-Cas9 and personalized medicine in modern healthcare, and (3) Educate students in the use of genetic technologies and how they can be incorporated into their research programs. This included making students aware of the resources available at UAB and training in the use and interpretation of GWAS, Next Generation Sequencing, microbiome, genetic repositories and microarrays. The course has been designed to accommodate distance learning and may either be taken as a 2 credit online course with flexible schedule or as a 3 credit hybrid course which included hands-on labs and paper discussion.

NUR 697. Department of Transportation Medical Examiner Certification Review Course. 1 Hour.
The purposes of this course are to: (1) introduce and asssist the student to gain mastery of the regulations and guidelines set forth by the U.S. Department of Transportation related to medical fitness for duty determination of commercial motor vehicle drivers; and (2) provide the student with an opportunity to demonstrate competency in conducting a DOT medical examination in the laboratory setting.

NUR 698. Research Practicum. 1-2 Hour.
This graduate course is designed to give the master¿s nursing student an opportunity to actively participate in the research process. This practicum course allows students to assume limited responsibilities in the development, execution, and/or dissemination of a research study by performing selected roles within the research team. It is acknowledged that given the limited time allotted to the practicum, students may only have the opportunity to participate in one phase of a study due to the extended period usually required to initiate and conduct a study, or to compile the data to present results to target audiences. This course may include integration of the a wide range of experiences such as: using informatics, data management, using statistical analysis software programs, scholarly writing, and preparing or giving presentations to professional or lay audiences. The advanced practice role emphasis of this course is that of investigator and research collaborator.

NUR 699. Thesis Research. 1-4 Hour.
The thesis is the result of original research work undertaken by the student and the interpretation of those results. The document should also demonstrate the candidates¿ acquaintance with the literature of the field and with proper selection and execution of research methodology. The physical form of the thesis must comply with published departmental and university guidelines for theses and dissertations. The student works under the guidance of a major professor with a committee of faculty members. However, the obligations of research, accuracy, writing, and quality rest with the student. A public defense of this work is expected. A minimum of four hours of credit is required for completion of thesis hours, although a variable number of hours may be taken per term as necessary. The advanced practice role emphasis of this course is that of investigator, research collaborator, and author.
Prerequisites: GAC M

NUR 700. Clinical Data Management and Analysis. 3 Hours.
This required course provides students with the knowledge base to understand, collect, manage, and measure clinical data. Students will explore data collection and management processes, levels of measurement, basic statistics, and measurement for improvement in order to effectively use clinical data. Data entry exercises employed through analytical tools and statistical software packages will allow the students to practice and apply the basic data management and analysis skills needed for the evaluation of clinical data and evidence-based practice.

NUR 701. Writing for Publication. 3 Hours.
This course concerns the development of skills in writing, editing, and preparing manuscripts for publication from initial idea to submission of a publishable manuscript. The course emphasizes a writing process that encourages productivity and collegial peer review. Legal and ethical aspects of authorship prepare students for responsible practices expected of scholars. Students should have mastered basic writing skills, e.g., grammar, syntax, and computer skills, prior to enrolling in this course.

NUR 706. Theory Building in Nursing. 4 Hours.
This course focuses on the nature of knowledge in practice disciplines with an emphasis on philosphy of science as an underpinning for knowledge development and research; approaches to theory, statement, and conceptual development, and criteria for evaluation of theory. Students examine a variety of sources regarding the nature and modes of theory, model, and concept development in practice disciplines. They select research literature in their substantive area for isolation of concepts, theories, and research contexts to assess congruence between theoretical and operational systems, and suggest ways to remedy problems. They interpret research reports in their substantive area from a theory develpment and testing perspective, providing a visual schematic representation of their analysis. Through group interation, they formulate conclusions about the state of the art and forecast directions for theory development as a basis for practice. Each student develops a personal philosophy of science. Admission to PhD program in nursing or permission of instructor.

NUR 729. Evidence-Based Practice Design and Translation. 3 Hours.
The purpose of this course is to provide students with models for evidence-based practice (EBP) design and improvement translation. Students learn to formulate clinical questions in answerable format, and search for and identify best research evidence. The focus of the course is to evaluate and critically appraise evidence for rigor and applicability to the clinical problem and is designed to improve clinical outcomes. Students will translate the evidence into practice environments for safe, high-quality care. Students will gain access to information that will support optimal clinical decision-making. Improvement translation sciences will also be introduced.

NUR 730. Current Topics in Nursing. 1-3 Hour.
A special topic seminar with variable focus.

NUR 731. Philosophical, Theoretical, and Conceptual Foundations for Advanced Practice Nursing. 3 Hours.
This required core course in the Doctorate of Nursing Practice program provides an understanding of the use of theory and conceptual foundation to guide the complexity of specialty nursing practice at the doctoral level. The content is derived from the philosophical and scientific underpinnings of nursing, natural, and psycho-social sciences.(on-line) (Essential I).

NUR 732. Design and Statistical Methods for Advanced Practice Nursing. 3 Hours.
This required core course for the Doctorate of Nursing Practice program provides the student with the basis to search, retrieve, and manipulate statistical data. The focus of this course is on quantitative and qualitative methodologies, research design, and data analysis. The content provides essential knowledge for evaluation of research to guide evidence-based practice at the highest level. (Essential III).

NUR 733. Informatics for Advanced Practice Nursing. 3 Hours.
This course focuses on the collection, organization, analysis, and dissemination of information in nursing and health care. Students are introduced to the specialty of nursing informatics, the information system life-cycle, telemedicine, and the use of technology to enhance nursing care delivery and patient safety. Also, students learn how to design, use, and manipulate large and small patient databases for the analysis of patient outcomes.

NUR 734L. Advanced Experiential Clinical Course. 1-6 Hour.
This course provides the opportunity for DNP students to demonstrate excellence in providing complex care and leadership in healthcare settings.

NUR 735. Population Health in Advanced Practice Nursing. 3 Hours.
This course for the Doctor of Nursing Practice program prepares the student to implement specialty population-based disease prevention and health promotion activities to achieve national and international goals of improving worldwide health status. The course focuses on a spectrum of issues affecting health, which include emerging infectious diseases, emergency preparedness, disparities in health and healthcare services, and the impact of behavior and lifestyle choices on health.

NUR 736. Application of Best Practices. 3-4 Hours.
This course prepares the student to evaluate interdisciplinary clinical and health systems for best practices and outcomes in a specialty area. Students acquire the knowledge, skills and tools to support, promote, and implement evidence-based specialty practice in nursing and health care delivery systems to improve health outcomes. Emphasis is on the synthesis, critique, and application of evidence to support quality clinical and organizational practices.
Prerequisites: NUR 731 [Min Grade: C] and NUR 732 [Min Grade: C]

NUR 737. Interprofessional Leadership and Role Development for Practice Excellence. 3 Hours.
This course is a required core DNP course that focuses on organizational and systems leadership and knowledge and skills critical to role development in independent and inter- and intra-disciplinary practice. Content includes communication, conflict resolution, collaboration and negotiation, leadership, and team functioning to maximize success in the establishment of safe, effective patient-centered care in complex environments.

NUR 738L. DNP Project Development. 2-3 Hours.
NUR 738L is a 3-hour seminar designed to assist the student in selecting an area of interest within a practice specialization, and in demonstrating professional competencies related to that area of interest. The student will document previously acquired abilities and competencies in a professional portfolio. Students will participate in the seminar to obtain guidance, be involved in discussion, and receive peer suggestions about the portfolio and project plans.
Prerequisites: (NUR 729 [Min Grade: B] or NUR 729 [Min Grade: B]) and (NUR 743 [Min Grade: B] or NUR 743 [Min Grade: B])

NUR 739L. DNP Project Implementation and Evaluation. 1-7 Hour.
This required course is the capstone clinical course in all advanced practice tracks. The student presents evidence of achievements and competencies in a professional portfolio. The practice residency is completed in a specialty area of the student's choice. One credit hour of each semester of the residency is devoted to classroom seminar. The seminar focuses on the aspects of the final practice project and interventions that promote health, prevent illness and disability, and alleviate health disparities. Small group sessions are formed for students who are at similar stages of completion of the course requirements. The final project is selected and planned by the student and the advisor, and is implemented during this course. The student completes the project, evaluates the outcomes, disseminates the findings, and makes a formal, scholarly presentation to faculty and peers.
Prerequisites: NUR 738L [Min Grade: P](Can be taken Concurrently) or NUR 738L [Min Grade: P](Can be taken Concurrently)

NUR 740. Health Policy and Politics: Implications in Health Care. 3 Hours.
This required core course in the Doctor of Nursing Practice program focuses on the basic principles of health policy and the influence of the political process as a systematic approach to health care in the United States and internationally. The course prepares students to assume complex leadership roles in order to advance specialty practice and health. This course focuses on the unique challenges of engaging and influencing health care policy in the U.S. and internationally. It is designed to develop skills, techniques, and approaches to the critical analysis of health policy proposals, health policies, and related issues from the perspective of consumers, nursing, other health professions, and other stakeholders in policy and public forums. The health policy framework is analyzed from a governmental, institutional, and organizational perspective.

NUR 741. Cancer Prevention and Control Training Program (CPCTP): Research Intensive. 2 Hours.
Grants process and proposal writing in healthcare research using NIH predoctoral and postdoctoral applications. Strategies for successful proposal preparation include the production of elements required in PHS-398 research grant proposal.

NUR 742. Program Evaluation and Methods. 3 Hours.
The purpose of this course is to synthesize knowledge related to translational/implementation science models and strategies to improved health outcomes. The emphasis in the course is the use of program evaluation as a strategic planning tool to achieve positive changes in health status, to initiate quality improvement, to engage in risk anticipation, management and to facilitate organizational and system level changes.
Prerequisites: NUR 700 [Min Grade: B](Can be taken Concurrently) or NUR 700 [Min Grade: B](Can be taken Concurrently) and (NUR 729 [Min Grade: B] or NUR 729 [Min Grade: B])

NUR 743. Evidence-Based Practice Strategies. 3 Hours.
This course is a required core Doctor of Nursing Practice Program course, which expands on foundational evidence-based practice concepts to refine a problem statement and derive a searchable and answerable clinical question. Content includes conducting a systematic review of the literature to guide the selection of methods, strategies, tools and metrics needed to complete a successful scholarly project. The course also addresses targeted strategies for disseminating evidence associated with scholarly projects.
Prerequisites: (NUR 731 [Min Grade: B] or NA 731 [Min Grade: B]) and NUR 729 [Min Grade: B]

NUR 744. Program Evaluation and Methods. 3 Hours.
The purpose of this course is to synthesize knowledge related to translational/implementation science models and strategies to improve health outcomes. The emphasis in the course is the use of program evaluation as a strategic planning tool to achieve positive changes in health status, to initiate quality improvement, to engage in risk anticipation, management and to facilitate organizational and system level changes.
Prerequisites: NUR 700 [Min Grade: B] and NUR 729 [Min Grade: B] and NUR 743 [Min Grade: B]

NUR 745. Foundations of Scholarly Writing. 3 Hours.
The purpose of this course is to provide students with the skills necessary for articulating concepts in a logical and scholarly manner. The focus of the course is on the development of literacy skills needed to locate, analyze, and apply information using a variety of techniques and resources The emphasis is on the development of skills in writing and editing the manuscript using scholarly grammar, syntax, punctuation, and sentence and paragraph structure.
Prerequisites: NUR 737 [Min Grade: B](Can be taken Concurrently)

NUR 750. Quantitative Research Methods. 3 Hours.
This course is a survey of quantitative research methods and the first required, research core course in the doctoral nursing program. The course is designed to prepare doctoral nursing students with the research knowledge and skills to: (1) use current research findings to improve practice, (2) use the process of research to examine questions identified in one's own nursing practice, and (3) contribute to expansion of nursing's knowledge base. This course will also include integration of the following elements and/or activities: critical thinking, synthesis of quantitative research literature, scholarly writing, scientific integrity and ethics, human diversity, and social issues. The advanced practice role emphasis of this course is that of investigator, research collaborator, and content expert in a selected practice field. Students must have a solid foundation in computer utilization and accessing scientific sources by Internet.

NUR 751. Philosophical Foundations of Science. 3 Hours.
The purpose of this course is to introduce the student to the concept of truth, and scientific worldviews used to confirm or refute truth over the course of history and during specific periods of social and political contexts. The overall desired student outcome of students participating in the course is demonstrated skill in analysis and application of diverse approaches to knowledge development to research.

NUR 752. Responsible Conduct of Research: A Cross-Cultural Perspective. 2 Hours.
This course will examine a wide range of historical and modern treatises that have shaped ethical practice in the dominant western culture as well as medical ethical theories in other cultures. The course will emphasize comparing and contrasting various world views of ethical research practice from a cultural and global perspective. The content will focus on the pillars of liberal political theory which include respect for persons, autonomy, justice and rights-based codes. In addition, the expectations and regulations of Institutional Review Boards will be examined with an emphasis on developing effective strategies to anticipate procedural problems and expedite approval of student research applications. In addition, students will complete and provide proof of current completion of the UAB IRB training course (within 12 months) as an initial pass/fail learning activity. This course will also include integration of the following elements and/or activiities: critical thinking, informatics, collaboration, scholarly writing, preparing/giving professional presentations, theory evaluation and application, human diversity, cultural competence, global concerns and health disparity issues. The advanced role emphasis of this course is that of investigator, research collaborator, and content expert in a selected practice field.

NUR 753. Nursing as a Scientific Discipline. 2 Hours.
The purpose of this course is to provide students with an overview of the processes of knowledge development and contributions of nursing to scientific knowledge. The course focuses on multiple ways of knowing and strategies for expanding knowledge to meet changing societal needs. Students will have an opportunity to appraise different modes of inquiry that contribute to knowledge development as well as integrate different scientific perspectives into a trajectory of research within nursing and multidisciplinary contexts.

NUR 754. Issues in Leadership and Health Policy. 3 Hours.
This graduate core course is designed to prepare doctoral nursing students with adanced theory in health care leadership and analysis of health policy: (1) examine theories of leadershp behavior to improve the delivery and or provision of nursing care, (2) examine aspects of leadership in policy analysis and advocacy, (3) develop an evidence-based foundation for practice as a nursing leader and (4) contribute to the improvement of patient care across the health care continuum through leadership. This course will also include integration of the following elements and /or activities: critical thinking, informatics, current technologies for information retrieval and data management, collaboration, scholarly writing, preparing/giving professional presentations, theory evaluation and application, scientific integrity and ethics, human diversity, cultural competence and health disparity issues. The advanced role emphasis of this course is that of research team leader, academic administrator, health policy advocate and content expert in a selected practice field. Admission to the Doctorate of Philosophy (PhD) Program of the School of Nursing.

NUR 755. Critical Analysis of Theories, Models, and Frameworks. 3 Hours.
The purpose of this course is to identify the underlying concepts and theories that will serve as the basis of conducting research in a focused area. Through literature review and discussion students will challenge each other to link the most relevant theory(s) including physiological, behavioral, and other theories of health and illness to their developing research questions. Students will perform a concept analysis relevant to their proposed area of research focus in order to begin to understand the complexity and issues of measurement and testing that they will face as they undertake rigorous study.
Prerequisites: NUR 751 [Min Grade: B] and NUR 753 [Min Grade: B]

NUR 756. Applied Statistical Analysis Techniques. 4 Hours.
This required core course in the Doctor of Philosophy program is intended to provide the student with the basis to search, retrieve, and manipulate statistical data. It provides an underpinning for the understanding of research methods and findings, and supports clinical scholarship practice.

NUR 757. Health Services Research in Nursing. 3 Hours.
The purpose of this course is to introduce health services research to a nursing audience. Students will gain an understanding of the domains of health services research, to include organizational systems research, patient outcomes research, improvement science, and program evaluation through analyzing studies that seek to answer contemporary problems in our health care system, particularly as they apply to nursing aspects of patient care. They will have the opportunity to identify critical problems in health care delivery, pose research questions and hypotheses, explore existing and innovative indicators and sources of data, and develop skill in analyzing such data. Students will also develop an appreciation for the broad implications of health services research in nursing.

NUR 758. Research and Health Policy. 3 Hours.
This graduate core course is designed to prepare PhD nursing students for designing research and translating evidence so as to influence health policy. This course will include integration of the following elements and/or activities: critical thinking, informatics, current technologies for information retrieval and data management, collaboration, scholarly writing, preparing/giving professional presentations, theory evaluation and application, scientific integrity and ethics, human diversity, cultural competence and health disparity issues.

NUR 759. Writing the Career Development Grant Proposal. 1 Hour.
The purpose of this course is to prepare PhD students in the foundations of writing grants for external funding. The Course addresses the grants process and proposal writing in healthcare research using the NIH pre-doctoral application as a template. Strategies for successful proposal preparation including development of elements required in NIH research grant proposal are covered.
Prerequisites: NRM 750 [Min Grade: B](Can be taken Concurrently) and NRM 752 [Min Grade: B]

NUR 760. Scientific Dissemination. 1 Hour.
The purpose of this course is to provide the student an understanding of why dissemination is essential for scientific advancement, with particular emphasis on peer-reviewed journals. To accomplish this, students will be provided with the basic components of writing a peer-reviewed manuscript for publication. Students will be provided a framework for how to generate a detailed outline for a scientific manuscript. Topics to be addressed include but are not limited to plagiarism, self-plagiarism, referencing guidelines (e.g., Endnote), and strategies for improving dissemination productivity. Additional topics to be addressed include: rules and responsibilities of authorship, copyright and conflict of interest, how to select a journal (i.e., impact factors, pros and cons of open access journals), the role of the editor and reviewers, the importance of adhering to journal guidelines and instructions, how and why to contact the editor, how to negotiate electronic submission portals, the peer-review process, how to respond to journal reviewers' feedback, and monitoring production details after the article is accepted (i.e., reviewing galley proofs, communication with production staff).

NUR 787. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the students' knowledge base.

NUR 790. Independent Study in Nursing. 1-9 Hour.
Independent Study in Nursing.

NUR 791. Independent Study in Clinical Nursing. 1-9 Hour.
Independent Study in Clinical Nursing.

NUR 797. Writing the Dissertation. 3 Hours.
The purpose of this course is to guide students in the development of an internally consistent dissertation research proposal that can be successfully defended as they progress toward candidacy. In addition, students will explore strategies for discussing research results and their contributions to the state of the science and theory development. Students are to work closely with their dissertation chair and members of their dissertation committee while developing the proposal.
Prerequisites: NRM 781 [Min Grade: B] or (NRM 783 [Min Grade: B] and NRM 798L [Min Grade: B])

NUR 798. Research Practicum. 1-9 Hour.
Research Practicum. The research practicum is a series of course credits taken throughout the student's doctoral coursework to provide continuous experience under the supervision of the mentor.

NUR 799. Dissertation Research. 1-9 Hour.
Dissertation Research - Prerequisites: Comprehensive Examination and admission to candidacy.
Prerequisites: GAC Z

NWH-Nursing - Womens Health Courses

NWH 618L. Focus on Advanced Nursing Practice Women. 3 Hours.
The purpose of this course will be the study of specialty track specific topics. The focus of the course will be on providing foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: (NUR 606 [Min Grade: B] or NUR 729 [Min Grade: B] or NUR 737 [Min Grade: B]) and (NUR 613 [Min Grade: B]) and NUR 614 [Min Grade: B](Can be taken Concurrently)

NWH 621. Advanced Women's Health Nursing I. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role of the Advanced Practice Nurse. The emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to women.
Prerequisites: (NUR 612 [Min Grade: B] or NUR 613 [Min Grade: B]) and (NUR 610 [Min Grade: B] or NUR 735 [Min Grade: B]) and (NUR 614L [Min Grade: B] or NUR 614 [Min Grade: B])

NWH 622. Advanced Women's Health Nursing II. 4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge of diagnoses and management of the health illnesses of women. The focus of this course is on health promotion and disease prevention and management strategies from inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high-quality evidence-based care to women.
Prerequisites: NWH 621 [Min Grade: B]

NWH 623. Advanced Women's Health Nursing III. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course is on the utilization of complex models and systems of practice to deliver high quality evidence-based care to women's health patients. The emphasis of the course is on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: NWH 622 [Min Grade: B] and NWH 686L [Min Grade: P]

NWH 631. Advanced Women's Health Nursing I. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role of the Advanced Practice Nurse. The emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to women.
Prerequisites: (NUR 612 [Min Grade: B] or NUR 612 [Min Grade: B]) and (NUR 613 [Min Grade: B] or NUR 613 [Min Grade: B]) and (NUR 610 [Min Grade: B] or NUR 610 [Min Grade: B]) or (NUR 735 [Min Grade: B] or NUR 735 [Min Grade: B]) and (NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B])

NWH 632. Advanced Women's Health Nursing II. 4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness of women. The focus of this course is on health promotion and disease prevention and management strategies from inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care to women.
Prerequisites: NWH 631 [Min Grade: B] or NWH 631 [Min Grade: B]

NWH 633. Advanced Women's Health Nursing III. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course is on the utilization of complex models and systems of practice to deliver high quality evidence-based care to women's health patients. The emphasis of the course is on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: NWH 632 [Min Grade: B] and NWH 686L [Min Grade: P]

NWH 685L. Practicum I: Women's Health Care Nurse Practitioner. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to women. The focus of this course is on the delivery of health care services to women. The emphasis of this course is on promoting the progression of competence within the Advanced Practice Nursing role.
Prerequisites: (NUR 610 [Min Grade: B] or NUR 610 [Min Grade: B]) or (NUR 735 [Min Grade: B] or NUR 735 [Min Grade: B]) and (NUR 614 [Min Grade: B] or NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B] or NUR 614L [Min Grade: B])

NWH 686L. Practicum II: Women's Health Care Nurse Practitioner. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to women. The focus of this course is to provide the student with opportunities to integrate in depth diagnostic and management skills to provide care for women. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: (NWH 631 [Min Grade: B] or NWH 631 [Min Grade: B]) and (NWH 685L [Min Grade: P] or NWH 685L [Min Grade: P])

NWH 687. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the student's knowledge base.

NWH 692L. Practicum III: Women's Health Care Nurse Practitioner. 4 Hours.
The purpose of this course is to refine management strategies and best practice models in the delivery of high quality care to women. The focus of this course is to evaluate progress toward achievement of professional competencies. The emphasis is on incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of women.
Prerequisites: NWH 686L [Min Grade: P] or NWH 686L [Min Grade: P]

NWH 718L. Focus on Advanced Nursing Practice. 3 Hours.
The purpose of this course is the study of specialty track-specific topics. The focus of the course is to provide foundational materials for specialized areas of advanced nursing practice. Emphasis is on exploring specific advanced nursing practice competencies.
Prerequisites: NUR 612 [Min Grade: B] and NUR 613 [Min Grade: B] and (NUR 610 [Min Grade: B] or NUR 735 [Min Grade: B]) and (NUR 614L [Min Grade: B] or NUR 614 [Min Grade: B])

NWH 721. Advanced Women's Health Nursing I. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to women.
Prerequisites: NUR 614 [Min Grade: B] and NWH 618L [Min Grade: P]

NWH 722. Advanced Women's Health Nursing II. 4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness of women in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The focus of this course is on the health promotion and disease prevention and the management of strategies from inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high-quality evidence-based care of women.
Prerequisites: NWH 721 [Min Grade: B]

NWH 723. Advanced Women's Health Nursing III. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course in on the utilization of complex models and systems of practice to deliver high quality evidence-based care as a Doctor of Nursing Practice prepared Advanced Practice Nurse to women. The emphasis of the course in on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: NWH 722 [Min Grade: B] and NWH 786L [Min Grade: P]

NWH 731. Advanced Women’s Health Nursing I. 5 Hours.
The purpose of this course is to introduce essential concepts in the safe and effective provision of advanced practice nursing. The focus of this course is to prepare the student to implement the role Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis of this course is on the acquisition of the knowledge and skills necessary to deliver safe and effective care to women.
Prerequisites: NWH 618L [Min Grade: P] and (NUR 614 [Min Grade: B] or NUR 614L [Min Grade: B])

NWH 732. Advanced Women’s Health Nursing II. 4 Hours.
The purpose of this course is to integrate prior theoretical and practical knowledge for diagnoses and management of the health and illness for women in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The focus of this course is on the health promotion and disease prevention and the management of strategies form inter-professional domains. The emphasis of this course is to examine current evidence that supports the delivery of safe and high quality evidence-based care of women.
Prerequisites: NWH 731 [Min Grade: B]

NWH 733. Advanced Women’s Health Nursing III. 5 Hours.
The purpose of this course is to synthesize in-depth knowledge and theoretical concepts as related to advanced practice nursing. The focus of this course in on the utilization of complex models and systems of practice to deliver high quality evidence-based care as a Doctor of Nursing Practice prepared Advanced Practice Nurse to women. The emphasis of the course in on the critical analysis of the evidence for applications that optimize health outcomes.
Prerequisites: NWH 732 [Min Grade: B] and NWH 785L [Min Grade: P]

NWH 785L. Practicum I: Women’s Health Nurse Practitioner. 3 Hours.
The purpose of this course is to demonstrate management strategies and apply selected practice models for the delivery of high quality care to women. The focus of this course is on the delivery of health care services to women. The emphasis of this course is on promoting the progression of competence within the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse.

NWH 786L. Practicum II: Women’s Health Nurse Practitioner. 3 Hours.
The purposes of this course are to prioritize management strategies and apply selected practice models for delivery of care to women. The focus of this course is to provide the student with opportunities to integrate in-depth diagnostic, management, and leadership skills in the role of the Doctor of Nursing Practice prepared Advanced Practice Nurse to provide care for women. The emphasis of this course is on the formulation and management of individualized treatment plans based on diagnostic findings and current practice models.
Prerequisites: NWH 731 [Min Grade: B] and NWH 785L [Min Grade: P]

NWH 787. Supplemental Nursing Course for Support. 1 Hour.
The purpose of this course is to introduce a structured format for students to review concepts and processes related to a specific patient population. This course focuses on the content presented throughout the program including pathophysiology, pharmacology, health assessment, evidence-based practice, leadership, and all specialty track content according to the program of study. The emphasis of this course is on test-taking strategies and the strengthening of the student's knowledge base.

NWH 792L. Practicum III: Women’s Health Nurse Practitioner. 4 Hours.
The purpose of this course is to enhance acquired management strategies and the use of best practice models in the delivery of high quality evidence-based care to women. The focus of this course is to evaluate progress toward achievement of competencies of the Doctor of Nursing Practice prepared Advanced Practice Nurse. The Emphasis is on the incorporation of evidence and concepts from previous coursework and clinical practice to improve the health status of women.
Prerequisites: NWH 732 [Min Grade: B] and NWH 786L [Min Grade: P]

School of Optometry

Dean: Kelly K. Nichols, OD, MPH, PhD

Founded in 1969, The UAB School of Optometry (UABSO) earned the notable distinction of being the first optometry school to be located on an academic medical center campus. The School's first Doctor of Optometry (O.D.) degrees were awarded in 1973 and since that time, the School has grown to include graduate degrees in Vision Science, post-doctoral optometry residency education, and the highly-unique OD/MBA dual-degree program. With relatively small class sizes of less than 50 students, an integrated medical/professional program for 1st year students, and an esteemed reputation in vision science research, UABSO continually remains positioned among the top optometry schools in the nation.

Vision Science

Degree Offered:	PhD, MS, OD/MS
Program Director:	Lawrence Sincich, PhD
Program Manager:	Kristi Smith, M.A.Ed.
Phone:	(205) 934-6743
E-mail:	krk@uab.edu
Website:	http://www.uab.edu/vsgp/

Program Information

Vision Science is a multidisciplinary field where basic scientists and clinicians focus on the discovery of new knowledge that will further our understanding of the eye and vision. This discovery includes virtually every scientific discipline where advances come from biologists, neuroscientists, optical engineers, epidemiologists, psychologists, optometrists, physicians and others.

The Vision Science Graduate Program at the University of Alabama at Birmingham provides comprehensive training for the next generation of leaders in vision science. Your decision to pursue graduate training in this program will place you at the center of one of the nation's top biomedical research institutions and will immerse you in collaborative multidisciplinary research environment that is today's model for biomedical research leadership. Moreover, our training environment will present opportunities for creative career paths such as dual degree programs with business, law and public health that will allow you to position yourself for a career as unique as your individual talents and interests.

Admission and Financial Aid

Applications for admission to the graduate program in vision science are reviewed by the Vision Science Graduate Program Admissions Committee. Qualified students admitted to the program may receive financial assistance in the form of annual stipends, tuition support, scholarships, and student health insurance.

Master of Science Degree

Vision Science Master's Program

Program requirements

Requirements		Hours
VIS 610	Ocular Anatomy and Biology	4
VIS 611	Biology and Pathology of Ocular Disease	4
GRD 717	Principles of Scientific Integrity	3
General Elective [1]		3
Available for Repeat Credit [2]		
VIS 698	Master's Level Non-Thesis Research	1-15
VIS 699	Master's Level Thesis Research	1-15
VIS 700	Vision Research Literature Review	1
Total Hours		**17-45**

1 Any graduate level elective can be taken for the program with advisor's permission for at least 3 credit hours.

2 VIS 698, VIS 699, and VIS 700 are available for repeat credit for up to a minimum of 32 hours to meet Vision Science masters requirements. **Please view the UAB School of Optometry Vision Science Graduate Program Handbook for more program information.**

Two calendar years are generally required to complete the Master of Science (MS) in the Vision Science Graduate Program. Each candidate must complete a minimum of 30 hours of credit: 24 credit hours in vision science and 6 credit hours in related graduate courses. In addition, the candidate must successfully complete and defend a research thesis.

Admission Requirements:

- GRE Optional
- TOEFL or IETLS tests required for international students (see program website for minimum scores)
- Undergraduate GPA of 3.0 on a 4.0 scale (B average)
- Strong background in the biological, physical or health sciences
- Three letters of recommendation

Doctor of Optometry / Master of Science —Dual Degree

OD/MS Dual Degree Program

Program Requirements

Requirements		Hours
GRD 717	Principles of Scientific Integrity	3
Available for Repeat Credit [1]		
VIS 698	Master's Level Non-Thesis Research	1-15
VIS 699	Master's Level Thesis Research	1-15
VIS 700	Vision Research Literature Review	1
Total Hours		**6-34**

1 VIS 698, VIS 699, and VIS 700 are available for repeat credit for up to a minimum of 30 hours to meet Vision Science masters requirements. **Please view the UAB School of Optometry Vision Science Graduate Program Handbook for more program information.**

Selected students in the UAB Optometry Professional Program are encouraged to combine the clinical doctorate degree with additional

research training in Vision Science. Financial assistance is available for qualified students. Potential candidates should have completed an undergraduate degree in a biological, physical, or health science field.

Admission Requirements:

- See Master Degree Requirements

Doctor of Philosophy Degree

Doctoral Program

Program Requirements

Requirements		Hours
VIS 610	Ocular Anatomy and Biology	4
VIS 611	Biology and Pathology of Ocular Disease	4
VIS 612	Optics for Vision Science	4
VIS 613	Visual Neuroscience	4
VIS 702	Fundamental Techniques in Vision Science	4
GRD 717	Principles of Scientific Integrity	3
BST 621	Statistical Methods I	3
General Electives [1]		6
Available for Repeat Credit [2]		
VIS 700	Vision Research Literature Review	1
VIS 798	Doctoral Level Non-Dissertation Research	1-15
VIS 799	Doctoral Level Dissertation Research	1-15
Total Hours		**35-63**

[1] Any two graduate level electives can be taken for the program with advisor's permission for at least 6 credit hours total.

[2] VIS 700, VIS 798, and VIS 799 are available for repeat credit for up to a minimum of 83 hours to meet Vision Science masters requirements. **Please view the UAB School of Optometry Vision Science Graduate Program Handbook for more program information.**

Doctoral research training leading to the PhD in Vision Science is based upon completion of graduate course work, a qualifying examination, research accomplishments, and successful defense of a dissertation. There is considerable flexibility in the coursework for the PhD in Vision Science. Each student is required to take the first-year core curriculum for their respective track, as well as courses in statistics and the ethical conduct of research. Students then take three additional courses, selected by the student in consultation with their academic advisor, which can include a wide range of interdisciplinary topics. Other graduate level courses can be substituted so that students can take maximum advantage of offerings in other programs at UAB. Individuals with previous clinical training will have opportunities for further clinical development and research integration. Students are also required to gain teaching experience.

Admission Requirements:

- GRE Optional
- TOEFL and/or IETLS tests required for international students (see program website for minimum scores)
- Undergraduate GPA of 3.0 on a 4.0 scale (B average)
- Strong background in the biological, physical or health sciences
- Three letters of recommendation

Additional Information

Deadline for Entry Term(s):	Fall
Deadline for All Application Materials to be in the Graduate School Office:	January 15th
Number of Evaluation Forms Required:	Three
Entrance Tests:	GRE optional, (TOEFL and TWE also required for international applicants whose native language is not English.) OAT is considered for combined degree programs, e.g. OD/ MS.
Web site:	http://www.uab.edu/vsgp/

For detailed information, contact the graduate program manager, Kristi Smith, UAB School of Optometry Vision Science Graduate Program, HPB 304-D, 1720 2nd Ave S., Birmingham, AL 35294-4390 (office location: Henry Peters Building, Room 304-D, 1720 University Blvd.).
Telephone 205-934-6743
E-mail krk@uab.edu
Web http://www.uab.edu/vsgp/

Courses

VIS 600. Clinical Vision Science Literature Review. 1 Hour.
Review, critical analysis and discussion of foundational literature and current topics in clinical vision science and evidence-based practice.

VIS 601. Fundamentals of Clinical Research. 2 Hours.
Introduction to fundamental principles of clinical research including: framing research questions, structured literature reviews, study design, sources of bias and their control, presentation and publication of research findings.

VIS 610. Ocular Anatomy and Biology. 4 Hours.
Anatomy, biochemistry, physiology, cellular and molecular biology of ocular tissues.

VIS 611. Biology and Pathology of Ocular Disease. 4 Hours.
Overview of ocular disease and pathology of the visual system including disease mechanisms and treatments.

VIS 612. Optics for Vision Science. 4 Hours.
Advanced topics in optics related to the eye and vision including paraxial, wave, and quantum optics, light safety, refraction, reflection, aberrations, interference, diffraction, polarization, Fourier optics, lasers, and fluorescence. The course will include applications for optical system design, biomedical imaging, microscopy, and clinical assessment of the eye and visual system.

VIS 613. Visual Neuroscience. 4 Hours.
Vision begins with photons and ends in the brain. How does it all work? This course introduces the student to the anatomical and physiological underpinnings of visual perception, stepping from single photoreceptors in the retina on through the cortical neural circuits devoted to capturing every facet of seeing the world. Lectures are supplemented with hands-on sessions where students can test their own vision.

VIS 615. The Body Electric: Electronics for Biologists. 3 Hours.
This course provides an overview of the fundamental concepts of electronics that are relevant to a biologist. The material is aimed at non-engineers who require a background in the circuit concepts needed for studying ion channels, electrophysiology, proper use of amplifiers and filters, and the use of computers to acquire and analyze data. There will be a mix of formal lectures and problem sets with practical hands-on experience.

VIS 670. Intermediate Orientation and Mobility Skills. 3 Hours.
Development of teaching skills in orientation and mobility in semi-independent settings with multihandicapped and blind students.

VIS 671. Intermediate Orientation and Mobility Seminar. 3 Hours.
Recent research practices and problem areas in special education. Focus onintermediate orientation and mobility for multihandicapped and blind students.

VIS 672. Advanced Orientation and Mobility Skills. 3 Hours.
Advanced orientation and mobility teaching techniques for travel in independent settings for multihandicapped and blind students.

VIS 673. Advanced Orientation and Mobility Seminar. 3 Hours.
Recent research practices and problem areas in special education. Focus onadvanced orientation and mobility for people with multiple handicaps and blindness.

VIS 674. Orientation and Mobility Internship. 3-6 Hours.
Demonstrate skills in applying principles of special methods of teaching, designing instruction, conducting skills assessments, and in preparing written reports, and consulting and collaborating with professionals and parents to assure orientation and mobility programming for students with visual impairments.

VIS 698. Master's Level Non-Thesis Research. 1-15 Hour.
Lab/research hours for master's students who have not entered into candidacy.

VIS 699. Master's Level Thesis Research. 1-15 Hour.
Lab/research hours for master's students who have entered into candidacy.
Prerequisites: GAC M

VIS 700. Vision Research Literature Review. 1 Hour.
Review, analysis, and discussion of foundational literature and current topics in basic and translational vision science.

VIS 701. Principles of Research. 2 Hours.
Principles and fundamentals of scientific thinking and practice including: framing the research question, critical thinking, literature review, use of modern information resources, experimental design, sources of bias and their control, reproducibility, presentation and publication of research findings, and case studies in failures of the scientific method.

VIS 702. Fundamental Techniques in Vision Science. 4 Hours.
This course is designed to provide graduate students with an overview of common laboratory techniques, both basic science techniques and clinical techniques, used in vision research.

VIS 703. Matlab: Imaging and Image Processing. 3 Hours.
This course is designed to provide graduate students with an introduction to the use of Matlab and its capabilities for analysis and quantification of image data. Students will learn the fundamentals of Matlab and the unique challenges of working with image data types.

VIS 704. Visual Communication for the Sciences. 3 Hours.
A workshop to develop visual communication skills using commonly encountered data in the quantitative sciences. Emphasis will be on the creation of clear figures that aim to appear in the professional literature.

VIS 705. Microscopic Anatomy of the Retina and Central Visu. 3 Hours.

VIS 710. Ocular Biochemistry and Molecular Biology. 3 Hours.
Ocular Biochemistry.

VIS 714. Ocular Biomechanics. 3 Hours.
This interdisciplinary course provides upper-division graduate students exposure to scientific principles and practices related to the biomechanics of soft-tissues and the eye. Knowledge of basic histology and ocular anatomy is assumed. The course will include lecture and laboratory exercises.

VIS 717. Research Ethics for the Clinician Scientists. 3 Hours.
Training in the principles of scientific integrity and research ethics with specific emphasis on issues encountered by clinician scientists engaged in clinical research (e.g. human subjects research, clinical trials, data safety monitoring, etc.).

VIS 729. Introduction to Neurobiology/Marine Biology. 4 Hours.

VIS 743. Optics and Imaging. 3 Hours.
Optical properties of the eye. Transparency, aberrations, modulation transfer functions of the eye. Use of coherent optics (lasers) invision research. MRI in vision research.

VIS 744. Ocular Anatomy, Physiology and Biochemistry of Anterior Serment. 3 Hours.
Anatomy of the eye. Biochemistry and physiology of ocular tissues, including tears, cornea, aqueous humor, lens, vitreous and sclera.

VIS 745. Ocular Anatomy-Physiology and Biochemistry II. 3 Hours.
Continued examination of ocular anatomy, biochemistry and physiology.

VIS 755. Electronic for Biologists. 3 Hours.
This course provides an overview of the fundamental concenpts of electronics that are relavance to a biologist. The material is aimed at non-engineers who need a backgroun in the circuit concepts needed for studying ion channels, electrophysiology, the basic s of the proper use of amplifer and fitler, and the use of computers to acquire and analyse data. There will be a mix of formal lectures and problem set with practical hands-on experience.

VIS 756. Visual Neuroscience. 4 Hours.
Vision begins with photons and ends in the brain. How does it all work? This course introduces the student to the anatomical and physiological underpinnings of visual perception, stepping from single photoreceptors in the retina on through the cortical neural circuits devoted to capturing every facet of seeing the world. Lectures are supplemented with hands-on sessions where students can test their own vision.

VIS 757. Functional MRI. 3 Hours.
In this course, we will explore the history of fMRI, design of fMRI experiments, and the analysis of fMRI data. We will also discuss several related techniques that are used in neuroimaging research. When designing fMRI experiments, it is important to know what techniques and statistical methods are available. It is also important to understand the kinds of hypotheses that can be tested with fMRI. By the end of this class, students will understand what led to the development of fMRI, when to use fMRI or related methods, limitations of experiments involving this technology, and different techniques for analyzing fMRI data. This class will be ‘hands-on’; each student will be required to design and execute an fMRI experiment.

VIS 760. Sensory Impairment Lit Review. 1 Hour.
Sensory Impairment and Deafblind literature review and presentation.

VIS 770. Advanced Graduate Seminar in Ocular Biology. 1-3 Hour.
Advanced graduate seminar in biology of the eye and visual system that will include critical review analysis, and discussion of fundamental literature and current topics.

VIS 771. Advanced Graduate Seminar in Ocular Surface. 1-3 Hour.
Review, analysis and discussion of current literature topics of ocular surface physiology and disease.

VIS 772. Advanced Graduate Seminar in Cornea and Anterior Segment. 1-3 Hour.
Advanced graduate seminar on topics related to the cornea and anterior segment that will include critical review and discussion of fundamental literature and current topics.

VIS 773. Advanced Graduate Seminar in Retinal Research. 1-3 Hour.
Advanced graduate seminar on topics related to retinal research that will include critical review, and discussion of fundamental literature and current topics.

VIS 774. Advanced Graduate Seminar in Visual Neurobiology. 1-3 Hour.
Advanced graduate seminar in visual neurobiology that will include critical review and discussion of fundamental literature and current topics.

VIS 775. Advanced Graduate Seminar in Ocular Motor Systems. 1-3 Hour.
Advanced graduate seminar in ocular motor systems that will include critical review analysis ,and discussion of fundamental literature and current topics.

VIS 776. Advanced Graduate Seminar on Refractive Error. 1-3 Hour.
Advanced graduate seminar on topics related to refractive error, ocular growth, and development that will include critical review, and discussion of fundamental literature and current topics.

VIS 777. Advanced Graduate Seminar in Public Health and Vision. 1-3 Hour.
Advanced graduate seminar on topics in public health issues with a focus on visual disorders that will include critical review and discussion of fundamental literature and current topics.

VIS 778. Advanced Graduate Seminar on Vision Rehabilitation. 1-3 Hour.
Advanced graduate seminar on topics in visual rehabilitation, orientation and mobility that will include critical review and discussion of fundamental literature and current topics.

VIS 779. Advanced Graduate Seminar in Interdisciplinary Sciences. 1-3 Hour.
Advanced graduate seminar on topics related to research that spans faculty and student interests across traditional academic disciplines or boundaries. The course will include critical review, and discussion of fundamental literature and current topics relevant to the participants.

VIS 790. Individual Topics and Advanced Topics. 1-3 Hour.

VIS 798. Doctoral Level Non-Dissertation Research. 1-15 Hour.
Lab/research hours for doctoral students who have not entered into candidacy.

VIS 799. Doctoral Level Dissertation Research. 1-15 Hour.
Lab/research hours for doctoral students who have entered into candidacy.
Prerequisites: GAC Z

School of Public Health

Dean: Paul C. Erwin, MD, DrPH
Associate Dean for Academic Affairs: Greg Pavela, PhD, MA
Website: www.uab.edu/soph
Primary Email: soph@uab.edu

About the School of Public Health

Schools of public health were established to develop leaders and scientists who could bring academic rigor to the discipline of "assuring conditions in which people can be healthy." Once the major challenges related to sanitation and clean water, vaccine-preventable diseases, and other communicable diseases were identified (although never fully solved!), public health as an academic discipline began to examine the larger issues of where and how we live, work, and play, and the influence these have on whether families, communities, and populations can live healthy lives.

The great challenges before us now are understanding the root causes — known as social determinants of health — that shape our capacity as individuals, families, communities, and populations to become and remain healthy. The COVID-19 pandemic unmasked the effects of these social determinants of health and their role in creating health inequities. We are just beginning to grasp how these determinants impact, and are impacted by, our environment, which in turn affects gene expression and individual susceptibilities to both communicable and non-communicable diseases. Connecting this understanding to the impacts of climate change on human health is a commitment the school is making through a new school-level faculty hiring initiative.

Our school engages with local leaders in Birmingham to address homicide as a public health crisis, supports community efforts to address the decades-long environmental injustices related to environmental contamination in north Birmingham, works with communities in the Black Belt of rural Alabama to understand the disparities in the development of hypertension, and develops novel methods of stemming the HIV/AIDS epidemic in Sub-Saharan Africa. Throughout the COVID-19 pandemic, public health leaders from our school have provided expert guidance to the University of Alabama System and UAB regarding COVID-19 related policies and procedures; we have been engaged in regular consultations with the Jefferson County Health Department in Birmingham, as well as with the Alabama Department of Public Health (ADPH); and we have supported the work of ADPH through our school's Case Investigation/ Contact Tracing activities, the establishment of a Regional Center for Infection Prevention and Control, and our management of COVID-19 testing in K-12 schools across the state.

Opportunities abound for students to explore connections between public health and other academic disciplines across the UAB campus. We offer practical and meaningful internship experiences through partnerships with state and local governmental agencies, local businesses and industry, and a global network of governmental and non-governmental organizations. Students have been at the forefront of our COVID-19 activities, most notably becoming Contact Tracers – simultaneously learning public health and DOING public health! Students in the UAB School of Public Health have life-changing opportunities to BE SOMEBODY and MAKE A DIFFERENCE! Come join us!

Admission Requirements

Our graduate programs in Biostatistics, Environmental Health Sciences, Epidemiology, Health Behavior, and Health Policy and Organization offer students intellectual tools to address complex problems with a global perspective. Whether you are looking for a highly rated program that provides the opportunity to work next to leading researchers or you are a graduate student looking for information related to your studies, we have everything you need. Click the applicable link below for information related to your particular need.

The UAB Graduate School's standard fee is $50 for domestic applicants and $60 for international applicants.

The cost for a **SOPHAS application** is $145 for the first school or program to which you apply. Any additional schools or programs to which you choose to apply will cost $55 per designation, even if you submit those schools or programs later in the application cycle. Still have questions? Send an email to **soph@uab.edu** or contact us by phone at (205) 934-4993.

If you're applying to a stand-alone MPH, MSPH, or DrPH program, you will submit your primary application via **sophas.org**. All students admitted through SOPHAS must also complete a supplemental application, and pay the application fee, to the UAB Graduate School. See our **website** for further information on program availability, where to apply, and when to apply.

Accelerated Learning Opportunities

Public Health offers both **Fast-Track and Accelerated Bachelor's/ Masters (ABM)** options for high-achieving undergraduate students.

The **Fast Track Master of Public Health Program** allows motivated undergraduate students to begin coursework for a Master of Public Health (MPH) degree while still completing their undergraduate degree requirements. We welcome students from#any major#to consider the Fast Track MPH program and will provide academic advising to assist students in planning their graduate coursework, which students can begin once they have completed 60 undergraduate credit hours (including 36 at UAB).

The **Accelerated Bachelor's to Master of Public Health Program** allows motivated undergraduate students to begin coursework for a Master of Public Health (MPH) degree while still completing their undergraduate degree requirements. We welcome students from any major to consider the ABM program and will provide academic advising to assist students in planning their graduate coursework, which students can begin once they have completed 60 undergraduate credit hours (including 36 at UAB). As a major benefit of this program, up to 12 hours of graduate credit can be counted toward (shared) with the undergraduate degree, saving students time and money.

Maintaining Status in ABM

To maintain status in ABM, the student must:

- maintain a 3.25 GPA average in undergraduate courses
- receive a B (or better) in the MPH courses taken while still an undergraduate student
- maintain full-time student status at UAB

Early Acceptance

Early Acceptance Programs are designed for academically superior high-school students. They allow high-achieving students to be conditionally admitted into a graduate program at the same time they are admitted to an undergraduate program. Students who were admitted to the **Early Acceptance Program** may enroll in the MPH program when eligible provided they maintain a 3.5 UAB undergraduate GPA.

Additional Information

Deadlines for All Applications (Both US and International)	www.uab.edu/soph/home/apply
	Fall Term (Domestic): July 1; (International): April 1; final deadlines vary by department
	Spring Term (Domestic and International): November 1 (except for Biostatistics, which only admits in the Fall)
	Summer Term (Domestic and International): April 1 (except for Biostatistics, which only admits in the Fall).
	Doctoral Programs: Deadlines vary by department
Entrance Test:	www.uab.edu/soph/home/apply (GRE recommended but not required for admission to MPH programs)
International Transcripts:	International transcripts must be submitted to World Education Services (WES) or Educational Credential Evaluators (ECE) for an official course-by-course credential evaluation (document-by-document evaluations will not suffice).
Number of Evaluation Forms Required:	Three letters of recommendation from academic or professional references.
Apply Webpage:	www.uab.edu/soph/home/apply

DEGREES OFFERED

Master of Public Health (MPH)

Prospective students should **click here** to obtain specific admission requirements on how to apply.

Environmental Health Concentrations:	Environmental Health (also online)
	Fast Track Environmental Health
	Accelerated Bachelor's / Masters (ABM) Environmental Health
Epidemiology Concentrations:	Epidemiology (also online)
	Fast Track Epidemiology
	Accelerated Bachelor's / Masters (ABM) Epidemiology
Health Behavior Concentrations:	Health Behavior (also online)
	Fast Track Health Behavior
	Accelerated Bachelor's / Masters (ABM) Health Behavior
Health Policy and Organization Concentrations:	Health Policy and Organization (also online)
	Fast Track Health Policy and Organization
	Accelerated Bachelor's / Masters (ABM) Health Policy and Organization
	Maternal & Child Health Policy & Leadership (also online)
	Accelerated Bachelor's / Masters (ABM) Maternal & Child Health Policy & Leadership
Public Health General Degree:	Population Health - individualized degree (also online)
Public Health Coordinated Degree Programs:	MPH / Doctor of Medicine
	MPH / Doctor of Optometry
	MPH / Doctor of Pharmacy
	MPH / Doctor of Philosophy in Civil Engineering
	MPH / Doctor of Veterinary Medicine (Auburn)
	MPH / Master of Business Administration
	MPH / Master of Science in Civil Engineering
	MPH / MS in Nutrition Sciences, Dietetic Internship/Clinical Track
	MPH / Juris Doctorate (Samford)
	MPH / Master of Public Administration
	MPH / Master of Social Work (UA)
	MPH / Master of Science in Physician Assistant Studies
	MPH / Master of Science in Health Administration

Master of Science in Public Health (MSPH)

Prospective students should **click here** to obtain specific admission requirements on how to apply.

Biostatistics Concentration:	Biostatistics
Environmental Health Concentrations:	Environmental and Occupational Health Sciences
	Industrial Hygiene
Epidemiology Concentration:	Applied Epidemiology

Health Policy and Organization Concentration:	Outcomes Research Online
Public Health MSPH Coordinated Program:	MSPH / Doctor of Medicine

Master of Science (MS)

Prospective students should **click here** to obtain specific admission requirements on how to apply.

Biostatistics Concentration:	Biostatistics
Health Policy & Organization Concentration:	Global Health

Doctor of Philosophy (PhD)

Prospective students should **click here** to obtain specific admission requirements on how to apply.

Biostatistics Concentration:	Biostatistics
Environmental Health Sciences Concentration:	Environmental Health Sciences
Epidemiology Concentration:	Epidemiology
Health Behavior Concentration:	Health Behavior

Doctor of Public Health (DrPH)

Prospective students should **click here** to obtain specific admission requirements on how to apply.

Health Policy and Organization Concentrations:	Health Policy and Organization
	Maternal & Child Health Policy
	Outcomes Research
Biostatistics Concentration:	Biostatistics

For detailed information about the graduate programs offered, please consult the **School of Public Health website** or visit the UAB School of Public Health:

Ryals Public Health Building
Room 130, Office of Student and Academic Services
1665 University Boulevard
Birmingham, AL 35294-0022
Telephone: (205) 934-4993
E-mail: soph@uab.edu
Website: www.uab.edu/soph
Facebook: www.facebook.com/UABSchoolofPublicHealth

BST-Biostatistics Courses

BST 601. Biostatistics. 4 Hours.
Logic and language of scientific methods in life science research; use of basic statistics in testing hypotheses and setting confidence limits. Simple and multiple regression and elementary experimental designs. BST 601 is a 4-credit course for MPH students. There are no formal prerequisites for this course; however, familiarity and comfort with basic mathematical concepts is essential. The minimum technical skills required include the ability to use Adobe Acrobat, Word, Excel, and PowerPoint. If you are deficient in any of these areas, it is your responsibility to improve your skills before starting the course.

BST 603. Introductory Biostatistics for Graduate Biomedical Sciences. 3 Hours.
This course will utilize current statistical techniques to assess and analyze health science related data.

BST 611. Intermediate Statistical Analysis I. 3 Hours.
Students will gain a thorough understanding of basic analysis methods, elementary concepts, statistical models and applications of probability, commonly used sampling distributions, parametric and non-parametric one and two sample tests, confidence intervals, applications of analysis of two-way contingency table data, simple linear regression, and simple analysis of variance. Students are taught to conduct the relevant analysis using current software such as the Statistical Analysis System (SAS).

BST 612. Intermediate Statistical Analysis II. 3 Hours.
This course will introduce students to the basic principles of tools of simple and multiple regression. A major goals is to establish a firm foundation in the discipline upon which the applications of statistical and epidemiologic inference will be built. If prerequisite is not met, permission of instructor is required.
Prerequisites: BST 611 [Min Grade: C]

BST 613. Intermediate Statistical Analysis III. 3 Hours.
This course will introduce students to additional general concepts in biostatistics beyond an introductory level to include study design, power and sample size estimation, mixed-models, survival analysis, survey design and interpretation of research results. We recommend a prior statistics/biostatistics course that included hypothesis testing for proportions and means, ANOVA, correlation, simple and multiple linear regression, and logistic regression (with approval of the instructor).
Prerequisites: BST 611 [Min Grade: C] and BST 612 [Min Grade: C]

BST 619. Data Collection and Management. 3 Hours.
Basic concepts of study design, forms design, quality control, data entry, data management and data analysis. Hands-on experience with data entry systems, e.g., DBASE, and data analysis software, e.g., PC-SAS. Exposure to other software packages as time permits. Previous computer experience or workshop on microcomputers highly recommended. NOTE: If space permits, non-degree graduate students will be permitted to enroll. All students registered for the course must attend 1st class to remain enrolled. Previous computer experience or workshop on microcomputers highly recommended.
Prerequisites: BST 611 [Min Grade: C] or BST 621 [Min Grade: C]

BST 620. Applied Matrix Analysis. 3 Hours.
Vector and matrix definitions and fundamental concepts; matrix factorization and application. Eigen-values and eigen-vectors, functions of matrices, singular and ill-conditioned problems.
Prerequisites: BST 622 [Min Grade: C]

BST 621. Statistical Methods I. 3 Hours.
Mathematically rigorous coverage of applications of statistical techniques designed for Biostatistics majors and others with sufficient mathematical background. Statistical models and applications of probability; commonly used sampling distributions; parametric and nonparametric one and two sample tests and confidence intervals; analysis of two-way contingency table data; simple linear regression; simple analysis of variance designs with equal or proportional subclass members; use of contrasts and multiple comparisons procedures; introduction to survival analysis; multivariate methods. Interested students must have a year of calculus sequence before enrolling in BST 621.

BST 622. Statistical Methods II. 3 Hours.
Mathematically rigorous coverage of applications of statistical techniques designed for Biostatistics majors and others with sufficient mathematical background. Statistical models and applications of probability; commonly used sampling distributions; parametric and nonparametric one and two sample tests and confidence intervals; analysis of contingency tables; simple linear regression; simple analysis of variance designs with equal or proportional subclass members; use of contrasts and multiple comparisons procedures; introduction to survival analysis; multivariate methods.
Prerequisites: BST 621 [Min Grade: B](Can be taken Concurrently)

BST 623. General Linear Models. 3 Hours.
Simple and multiple regression using matrix approach; weighted and non-linear regression; variable selection methods; modeling techniques; regression diagnostics and model validation; systems of linear equations; factorial designs; blocking; an introduction to repeated measures designs; Coding schemes.
Prerequisites: BST 622 [Min Grade: B]

BST 624. Experimental Design. 3 Hours.
BST 624 provides intermediate level training for the design of experiments in biomedical research. It will cover classical experimental designs including factorial and nested (hierarchical) designs, Latin squares, incomplete block designs, and fractional factorials. It will use a matrix approach to analysis. In addition, it will emphasize statistical methodology and communication of procedures, results, and conclusions. Students are expected to have prior coursework in calculus and matrix algebra. Additional prerequisites include successful completion (B or higher) in either the BST 621/622 sequence or the BST 611/612 sequence.
Prerequisites: (BST 621 [Min Grade: B] and BST 622 [Min Grade: B]) or (BST 611 [Min Grade: B] and BST 612 [Min Grade: B])

BST 625. Design/Conduct Clinical Trials. 3 Hours.
Concepts of clinical trials; purpose, design, implementation and evaluation. Examples and controversies presented.
Prerequisites: (BST 611 [Min Grade: B] and BST 612 [Min Grade: B]) or (BST 611Q [Min Grade: B] and BST 612Q [Min Grade: B]) or (BST 621 [Min Grade: B] and BST 622 [Min Grade: B])

BST 626. Data Management and Reporting with SAS. 3 Hours.
This course is designed to provide an introduction to data management and reporting using the SAS system.

BST 630. Estimation & Inference. 3 Hours.
This course is an introduction to probability concepts and statistical inference. Topics include counting techniques, discrete and continuous univariate and multivariate random variables & common distributions, probability, expectation, variance, confidence intervals, the Central Limit Theorem, and hypothesis testing. Restricted to MSPH and DrPH students. Preq: Calculus II.

BST 631. Statistical Theory I. 4 Hours.
Fundamentals of probability; independence; distribution and density functions; random variables; moments and moment generating functions; discrete and continuous distributions; exponential families, marginal and conditional distributions; transformation and change of variables; convergence concepts, sampling distributions. Point and interval estimation; hypothesis and significance testing; sufficiency and completeness; ancillary statistics; maximum likelihood and moment estimators; asymptotic properties of estimators and tests; introduction to Bayesian inference. Prerequisites: Proficiency in Algebra and calculus is required.

BST 632. Statistical Theory II. 4 Hours.
Fundamentals of probability; independence; distribution and density functions; random variables; moments and moment generating functions; discrete and continuous distributions; exponential families, marginal and conditional distributions; transformation and change of variables; convergence concepts, sampling distributions. Point interval estimation; hypothesis and significance testing; sufficiency and completeness; ancillary statistics; maximum likelihood and moment estimators; asymptotic properties of estimators and tests; introduction to Bayesian inference.
Prerequisites: BST 631 [Min Grade: B]

BST 640. Nonparametric Methods. 3 Hours.
Properties of statistical tests; order statistics and theory of extremes; median tests; goodness of fit; tests based on ranks; location and scale parameter estimation; confidence intervals; association analysis; power and efficiency.
Prerequisites: BST 621 [Min Grade: C] and BST 631 [Min Grade: C]

BST 655. Categorical Data Analysis. 3 Hours.
Intermediate level course with emphasis on understanding the discrete probability distributions and the correct application of methods to analyze data generated by discrete probability distributions. The course covers contingency tables, Mantel-Haenszel test, measures of association and of agreement, logistic regression models; regression diagnostics; proportional odds; ordinal and polytomous logistic regression; Poison regression; log linear models; analysis of matched pairs; and repeated categorical data.
Prerequisites: BST 621 [Min Grade: B] and BST 622 [Min Grade: B]

BST 660. Applied Multivariate Analysis. 3 Hours.
Analysis and interpretation of multivariate general linear models including multivariate regression, multivariate analysis of variance/covariance, discriminant analysis, multivariate analysis of repeated measures, canonical correlation, and longitudinal data analysis for general and generalized linear models. Extensive use of SAS, SPSS, and other statistical software.
Prerequisites: BST 623 [Min Grade: B]

BST 661. Structural Equation Modelling. 3 Hours.
Basic principles of measurements; factor analysis and latent variable models; multivariate predictive models including mediation mechanisms and moderators effects;path analysis;intergrative mutivariate covariance models, methods of llongitudinal analysis.
Prerequisites: BST 623 [Min Grade: C]

BST 665. Survival Analysis. 3 Hours.
Kaplan-Meier estimation; Parametric survival models; Cox proportional hazards regression models; sample size calculation for survival models; competing risks models; multiple events models.
Prerequisites: BST 622 [Min Grade: B](Can be taken Concurrently)

BST 670. Sampling Methods. 3 Hours.
Simple random, stratified, cluster, ratio regression and systematic sampling; sampling with equal or unequal probabilities of selection; optimization; properties of estimators; non-sampling errors; sampling schemes used in population research; methods of implementation and analyses associated with various schemes.
Prerequisites: BST 631 [Min Grade: C]

BST 671. Meta-Analysis. 3 Hours.
Statistical methods and inference through meta analysis.
Prerequisites: BST 622 [Min Grade: C] and BST 632 [Min Grade: C]

BST 675. Introduction to Statistical Genetics. 3 Hours.
This class wil introduce students to population genetics, genetic epidemiology, microarray and proteomics analysis, Mendelian laws, inheritance, heritability, test cross linkage analysis, QTL analysis, human linkage and human association methods for discrete and quatitative traits.

Prerequisites: BST 611 [Min Grade: C] or BST 621 [Min Grade: C]

BST 676. Genomic Data Analysis. 3 Hours.
The purpose of this class is to teach graduate students practical skills and statistics concepts and methods that underlie the analysis of high-dimensional genomic big data generated by high throughput technologies, as well as issues in the experimental design and implementation of these technologies. Lectures contents will be delivered often with live demonstrations. Afterwards, students will be immersed by practical problem solving sessions. The R language will be used for programming throughout the course.
Prerequisites: BST 611 [Min Grade: B] or BST 621 [Min Grade: B]

BST 680. Statistical Computing with R. 3 Hours.
This course is mainly focused on R and how to use R to conduct basic statistical computing. The course contains three themes: R programming, introduction to high performance computing, and basics of statistical computing.
Prerequisites: BST 621 [Min Grade: C] and BST 622 [Min Grade: C] and BST 626 [Min Grade: C]

BST 685. Training in Biostatistics Teaching. 3 Hours.
Acquire skills for teaching in higher education, including syllabus design, communication skills for the classroom and office hours, creating assignments and rubrics, preparing and giving lectures, preparing nondidactic content, and effective grading. Prerequisites: Must have completed the course that you will be the TA, or similar course, in a prior semester with a grade of B or higher. Completed the Biostatistics Qualifying Exam at the applicable level, have an overall GPA of 3.0 or higher (be a student in good standing with the UAB Graduate School). Receive an invitation from the applicable faculty member to register for this course.

BST 690. Biostatistical Consulting and Applied Problems. 3 Hours.
Students will work individually to address, analyze and present the results of an applied problem or grant design each week. The presentation of approaches, solutions and designs will be conducted in a round table format. Students will be evaluated on the quality of solution and by their presentation and class participation.
Prerequisites: BST 621 [Min Grade: C] and BST 622 [Min Grade: C]

BST 691. Pre-Doctoral Seminar Series. 1 Hour.
Biostatistics Seminar Series. This course is restricted to Biostatistics in Public Health majors only. This course provides an opportunity for students to learn about ongoing research in the field of biostatistics, clinical trials, and statistical genetics.

BST 695. Special Topics. 1-3 Hour.
Special topics in Biostatistics not covered in regular 600 level courses, but suited for Masters students in Biostatistics and doctoral students in other related disciplines.

BST 698. Non Thesis Research. 1-12 Hour.
Independent non-thesis research with guidance of appropriate faculty. Restricted to Biostatistics Majors only or permission of instructor / department.

BST 703. Methods in Evidence-Based Public Health. 3 Hours.
This course introduces students to the Evidence-Based Public Health (EBPH) framework. The Evidence-Based Public Health framework will be used to collaborate with the Jefferson County Department of Health (JCDH) on; 1) identifying critical public health needs in our local area; 2) suggesting appropriate evidence-based policies and interventions to address these needs; 3) proposing an evaluation plan to assess the impact of the suggested policy or intervention.

BST 723. Theory of Linear Models. 3 Hours.
Multivariate normal distributions and quadratic forms; least square estimation; nested models; weighted least squares, testing contrasts; multiple comparison; polynomial regression; maximum likelihood theory of log linear models will be studied.
Prerequisites: BST 632 [Min Grade: B]

BST 724. Experimental Design. 3 Hours.
This course provides training for the design of experiments in biomedical research. BST 724 extends the intermediate training to delve into more theoretical justification and advanced applications. The course will cover classical experimental designs including factorial and nested (hierarchical) designs, Latin squares, incomplete block designs, fractional factorials, and mixture designs. It will use a matrix approach to analysis. In addition, it will emphasize statistical methodology and communication of procedures, results, and conclusions. BST 724 is intended for advanced graduate students in the Department of Biostatistics who have completed BST 621/622, 623, and 631/632.
Prerequisites: BST 621 [Min Grade: B] and BST 622 [Min Grade: B] and BST 623 [Min Grade: B] and BST 631 [Min Grade: B] and BST 632 [Min Grade: B]

BST 725. Advances Clinical Trails. 3 Hours.
This course will provide students with the tools to develp a basic understanding of the fundamental statistical principles involved in the design and conduct of clinical trials.
Prerequisites: BST 611 [Min Grade: C] and BST 612 [Min Grade: C] or BST 621 [Min Grade: C] and BST 622 [Min Grade: C] and BST 625 [Min Grade: C]

BST 726. Advanced Clinical Trials II. 1 Hour.
This course builds on the knowledge gained in BST 725 in order to develop a more thorough understanding of the basic methodology behind important statistical concepts used in the design and analysis of large, randomized clinical trials. The class will involve discussions of publications dealing with current topics of interest in clinical trials.
Prerequisites: BST 621 [Min Grade: C] and BST 622 [Min Grade: C] and BST 625 [Min Grade: C] and BST 631 [Min Grade: C] and BST 632 [Min Grade: C] and BST 725 [Min Grade: C]

BST 735. Advanced Inference. 4 Hours.
Stochastic convergence and fundamental inequalities; weak convergence and the central limit theorems; large sample behavior of the empirical distribution and order statistics; asymptotic behavior of estimators and tests with particular attention to LR, score and Wald tests.
Prerequisites: BST 631 [Min Grade: B] and BST 632 [Min Grade: B]

BST 740. Bayesian Analysis. 3 Hours.
To introduce the student to the basic principles and tools of Bayesian Statistics and most importantly to Bayesian data analysis techniques. A major goal is to establish a firm foundation in the discipline upon which the applications of statistical and epidemiologic inference will be built.
Prerequisites: BST 632 [Min Grade: C]

BST 741. Advanced Bayesian Analysis II. 3 Hours.
This course is intended to illustrate advanced Bayesian modeling and computation for variety of models and problems.
Prerequisites: BST 631 [Min Grade: B] and BST 632 [Min Grade: B]

BST 750. Stochastic Modeling. 3 Hours.
Poisson processes; random walks; simple diffusion and branching processes; recurrent events; Markov chains in discrete and continuous time; birth and death process; queuing systems; applications to survival and other biomedical models will be studied.
Prerequisites: BST 632 [Min Grade: C]

BST 760. Generalized Linear and Mixed Models. 3 Hours.
Generalized linear models; mixed models; and generalized estimating equations.
Prerequisites: BST 723 [Min Grade: B]

BST 765. Advanced Computational Methods. 3 Hours.
Numerical algorithms useful in biostatistics including likelihood maximization using the Newton-Raphson method, EM algorithm, numerical integration using quadratic and Monte-Carlo methods, interpolation using splines, random variate generation methods, data augmentation algorithm, and MCMC and Metropolis-Hastings algorithm; randomization tests; resampling plans including bootstrap and jackknife will be studied.
Prerequisites: BST 632 [Min Grade: B]

BST 775. Statistical Methods for Genetic Analysis I. 3 Hours.
This course will provide a staistical basis for describing variation in qualitative (disease) and quantitative traits. This will include decomposition of trait variation into components representing genes, environment and gene-environment interaction. Resemblance between relative and heritability will be described. Important topics of discussion will include oligogenic and polygenic traits, complex segregations analysis, methods of mapping and characterizing simple and complex trait loci. NOTE: It is assumed that students are comfortable with regression theory, covariance, correlation, and likelihood theory. Interested students are urged to contact the instructors with concerns regarding assumed knowledge.
Prerequisites: BST 623 [Min Grade: C] and BST 632 [Min Grade: C] and BST 675 [Min Grade: C]

BST 776. Statistical Methods for Genetic Anlaysis II. 3 Hours.
This course builds on the knowledge gained in BST 775 with rigorous mathematical & statistical treatment of methods for localizing genes and environmental effects involved in the etiology of complex trits using case-control and pedigree data. NOTE: Knowledge of SAS and programming languages such as C++, and basic knoledge of multivariate methods and Markov chain theory is highly recommended.
Prerequisites: BST 775 [Min Grade: C]

BST 790. DrPH Applied Practice Experience. 3-6 Hours.
All DrPH students will complete an applied practice experience (Practicum) in which the student will complete at least one project that is meaningful for a public health organization and to advanced public health practice.

BST 793. Post-doc Seminar Series. 3 Hours.
BST seminar series. Permission of instructor / department required.

BST 795. Advanced Special Topics. 1-6 Hour.
This course is designed to cover advanced special topics in Biostatistics that are not covered in regular 700 level courses, but suited for doctoral students in Biostatistics.
Prerequisites: BST 622 [Min Grade: B] and BST 632 [Min Grade: B]

BST 798. Non-Dissertation Research. 1-12 Hour.
Non-dissertation research with the guidance of appropriate faculty. Research conducted before admission to candidacy for the doctoral degree. Biostatistics majors only or permission of instructor / department required.

BST 799. Dissertation Research. 1-12 Hour.
Doctoral Level Dissertation Research under the direction of the dissertation research committee. Reserved for Biostatistics only or permission of instructor /department. Admission to Candidacy required.
Prerequisites: GAC Z

ENH-Environmental Health Sci Courses

ENH 600. Fundamentals of Environmental Health Science. 3 Hours.
We live inextricably with our surroundings, including both the natural and built environments. And in these surroundings both natural and man-made components can impact how we live because they impact our health and our safety. This course will critically examine major factors found around us in our everyday lives and investigate how human health is impacted. Regulatory controls, risk, and preparedness will be discussed with respect to decreasing the negative environmental impacts on public health.Prerequisite: Admission into an MPH program, School of Public Health or special permission from the course director.

ENH 605. Remote Sensing and Public Hlth. 3 Hours.
Observing global patterns via satellites can help with research endeavors, this course will focus on the applications of remote sensing to both health and the social sciences. Hands on experience using satellite remote sensing will enrich the experience. This course will give students the chance to learn about a wide rande of remote sensing applications in both classrooms and lab settings. The course will progress from basic remote sensing analysis techniques to the point where the students are responsible for their own research projects.

ENH 610. Environmental Disasters. 3 Hours.
Examines the worldwide problem of toxic disasters, particularly those involving invisible agents (chemicals, infectious disease agents, radiation). Theory, case studies, field experience, and current scientific research are reviewed, and the public health, environmental, human services and public policy implications of toxic disasters are discussed.

ENH 611. Environmental & Occupational Exposure Assessment. 3 Hours.
This course is intended to develop an understanding and appreciation of environmental exposure assessment and its role in providing the tools and information for toxicology, epidemiology, and risk management. The course material introduces the general concepts of first recognizing environmental exposures to chemicals in human populations, and then using sampling techniques to assess exposures. This is a designated service learning course.

ENH 612. Assessing & Managing Environmental Risks. 3 Hours.
The purpose of this course is to provide students with an overview of environmental policy, with a focus on demonstrating how toxicology and exposure measurements are used in environmental risk assessment and management. Students are presented with the basic elements of a quantitative risk assessment including hazard identification, exposure assessment, dose-response assessment, and risk characterization. This course is designed to instill critical thinking regarding the often conflicting economic, social, and environmental tradeoffs inherent in environmental policy and management.
Prerequisites: ENH 650 [Min Grade: C](Can be taken Concurrently) or ENH 650Q [Min Grade: C]

ENH 615. Environmental Justice and Ethics. 3 Hours.
This course will critically examine one of the fastest growing social movements in the United States, the movement for environmental justice, and will explore the relationships among environmentalism and ethics. We will discuss the ethical considerations underlying the placement of hazardous waste sites and toxic industries in poor communities and communities of color, as well as the economic and social issues that resulted from these actions. The course will also focus on Native American communities in the west, colonialism and global justice/human rights.

ENH 617. Sustainability and Public Health. 3 Hours.
Starting from a foundation of sustainability framed by the UN sustainable development goals, this course examines placed-based examples of successes and challenges in sustainability and public health. Students will critically evaluate the intersecting factors contributing to and scientific/policy evidence underpinning socially, environmentally, and economically unsustainable elements of our local community, and how these situations impact human health and well-being. Particular areas of emphasis include the built environment, transportation, waste, food, supply chain, energy, and climate change. Course presentation will include lectures, readings, field experiences, community engagement, and videos/film.

ENH 621. Fundamentals of Industrial Hygiene. 3 Hours.
Chemical, physical and other hazards and stresses found in the work environment. Recognizing potential hazards by understanding industrial processes, toxicity of environmental contaminants and occupational disease processes. Study design and preparation for field evaluation, conduct of industrial hygiene surveys, and interpretation of survey results.

ENH 624. Control of Occupational Hazards. 2 Hours.
Importance of engineering controls in reducing occupational health hazards. Substitution of less toxic substances, modification of work processes, and design of local exhaust ventilation systems; proper selections and use of personal protective equipment, especially respirators, also considered.

ENH 625. Industrial Hygiene Case Studies. 2 Hours.
Integrates students' basic knowledge through consideration of real work-place situations. Step-by-Step analysis of case reports covering occupational health problems in representative industrial situations. Sequential presentation of overview of working conditions, survey strategies, interpretation of results, and recommendations.

ENH 626. Physical Agents. 2 Hours.
Sources, effects, and control of occupational and environmental noise, ionizing and non-ionizing radiation, and temperature extremes. Review of exposure standards and introduction of measurement equipment and techniques.

ENH 635. Foodborne and Waterborne Diseases: Causes and Prevention. 3 Hours.
This course provides a broad overview of the major foodborne and waterborne diseases. The course describes how information from surveillance is used to improve public health policy and practice in ways that contribute to the safety of our food and water. We focus on the pathogens responsible for food- and water-transmitted diseases, discussing the diseases they cause, their prevalence and relevance to public health in developed and developing nations; disease pathogenesis and clinical manifestations; reservoirs, modes of transmission, and strategies for detection and prevention.

ENH 650. Essentials of Environmental and Occupational Toxicology and Diseases. 3 Hours.
Serves as introductory graduate level course that focuses on multiple aspects of toxicology and disease processes associated with environmental and occupational exposures. Students learn basic terminology and concepts of environmental and occupational toxicology as well as occupational and environmental disease recognition, management and prevention. Emphasis is on scientific foundations rather than on addressing topical issues. The general course orientation is towards basic principles, organ system physiology, diseases and prevention. This is a designated service learning course.

ENH 660. Fundamentals of Air and Water Pollution. 3 Hours.
The course is an integrated introduction to air and water pollution, including its sources, transport and effects. The course focuses on the measurement and characterization of air pollutants and the assessment of water quality. Emphasis will also be given to the regulatory control of pollutants and to the technical aspects of engineering controls. The potential impact of air pollutants on the climate change will also be emphasized.

ENH 661L. Environmental Sampling and Analysis Laboratory. 3 Hours.
This course is designed to provide the students with a thorough understanding of the principles and practice of air and water sampling and familiarize them with the analytical methods used for air and water pollutant analysis. The course will focus on contaminant gases, vapors, suspended particulate material and dissolved chemicals in water. A basic understanding of chemistry and physics is a prerequisite.

ENH 670. Fundamentals of Occupational Safety. 3 Hours.
Basic principles of safety and loss control; emphasis on prevention of losses of people, property, and products in the work place. Developing competence in human-factors engineering, fire prevention, physical and behavioral science, product safety, and science of accident prevention.

ENH 680. Interdisciplinary Field Studies. 1 Hour.
In this course, students will be organized into interdisciplinary teams to include at least one representative of each occupational safety and health academic discipline and participate in team building activities to facilitate group interactions for the interdisciplinary course ENH 681 in the spring. Students will be exposed to basic concepts of occupational hygiene, learn to recognize different types of hazards (i.e. chemical, biological, physical agents) in the workplace and their health outcomes, conduct a walkthrough survey of an occupational setting, attend OHS seminars and meetings, work collaboratively with other OHS students and professionals on projects, and learn how collaborations with other health professionals with complementary skills can help them achieve a comprehensive occupational health and safety goal. Students enrolled in this course must be admitted to one of the academic programs of the Deep South Education and Research Center. This class is a requirement for all NIOSH trainees.

ENH 681. Interdisciplinary Worksite Evaluations. 2 Hours.
To assist students in developing critical thinking and analytical skills, provide them with experience in applying discipline-specific knowledge in a broad occupational health and safety context, and provide experience in working in interdisciplinary teams. The course consists of an overview of survey methodology and information sources, with emphasis on job safety analysis, a review of the occupational site or process to be evaluated and a report of the identified hazards and recommended controls.
Prerequisites: ENH 680 [Min Grade: C](Can be taken Concurrently) or ENH 680Q [Min Grade: C]

ENH 689. Environmental Health Sciences Integrative Learning Experience. 2 Hours.
The ENH ILE or capstone course represents a culminating experience that allows students to demonstrate synthesis of foundational and concentration competencies. This course will provide students with the opportunity to use skills gained during your MPH program to assess different aspects of a community's assets, environment, or health. This course will offer insights on current research and practice, how policies influence health and allow students to identify root causes of public health issues. All MPH students must complete this capstone course to graduate during the final term of enrollment.
Prerequisites: PUH 688 [Min Grade: C]

ENH 690. Environmental Health Perspectives. 1 Hour.
ENH 690 represents a broad overview of Environmental Health from a variety of perspectives. All MPH students in the SOPH, regardless of departmental or program affiliation, must complete this course to graduate. This course provides all MPH students the opportunity to consider how the various disciplines in public health intersect with environmental health. The course will offer insights on current research and practice, how policies influence health, and give students the opportunity to identify root causes of public health issues within the context of environmental health.
Prerequisites: PUH 601 [Min Grade: C] and PUH 602 [Min Grade: C] and PUH 603 [Min Grade: C] and PUH 604 [Min Grade: C] and PUH 605 [Min Grade: C] and PUH 606 [Min Grade: C]

ENH 691. Current Topics in Environmental Health and Occupational Health and Safety. 1-3 Hour.
Development of communication skills through objectively reviewing scientific literature; presentations and summaries of research or professional activities.

ENH 695. Seminar on Selected Environmental Health Topics. 1-9 Hour.
This course will be used as faculty design and craft course topics based on specific interests. These courses will be taught on a masters level.

ENH 697. Internship. 3 Hours.
The internship provides an opportunity for each student to work in a public health setting in a position that carries responsibility and is of particular interest. In order to register for the internship course, students must have completed all public health core coursework. Usually, this means that students must wait until their 3rd semester to complete the internship. Students must complete a minimum of 180 contact hours with the organization during the semester in which they register for the internship.
Prerequisites: (BST 601 [Min Grade: C] or BST 601Q [Min Grade: C] or PUH 601 [Min Grade: C]) and (ENH 600 [Min Grade: C] or ENH 600Q [Min Grade: C] or PUH 602 [Min Grade: C]) and (EPI 600 [Min Grade: C] or EPI 600Q [Min Grade: C] or PUH 603 [Min Grade: C]) and (HB 600 [Min Grade: C] or HB 600Q [Min Grade: C] or PUH 604 [Min Grade: C]) and (HCO 600 [Min Grade: C] or (PUH 605 [Min Grade: C] and PUH 606 [Min Grade: C]) or HCO 600Q [Min Grade: C])

ENH 698. Masters Directed Research. 1-9 Hour.
Independent study with guidance of appropriate faculty.

ENH 699. Masters Level Project Research. 1-9 Hour.
Research for project under direction of research project committee.
Prerequisites: GAC M

ENH 700. Scientific Basis of Environmental Health. 3 Hours.
This is an overview course that is intended to provide doctoral students with a broad understanding of the scientific principles on which environmental health is based within the context of the interaction of human activities and ecosystems, and the reciprocal impact of those interactions on human health and global ecology.

ENH 701. Advanced Environmental Chemistry. 3 Hours.
The course will describe the underlying physicochemical and mathematical formulations governing environmental physico-chemical processes including the coupling with biological media. Specific attention will be paid in understanding the physical basis of the processes and critical variables rather than memorizing the mathematical equations. The kinetics and thermodynamics of chemical transformations including redox and photolysis reactions will be introduced. Subsequently, specific environmental cases involving aquatic and atmospheric environments will be thorough investigated. Students are strongly recommended to have: (1) understanding of organic chemistry and basic thermodynamics; (2) comfort with math.

ENH 705. Special Topics in Environmental and Occupational Health Occupational Hygiene Research - Journal Club. 1-9 Hour.
This course is designed to provide advanced (doctoral) students in Environmental Health Sciences in general, and Industrial hygiene in particular an overview of the research literature and introduction in advance topics such as nanomaterials, control banding, quantitative occupational exposure assessment, etc. Students will have the opportunity to present their own research, learn about the research conducted by their peers and conduct critical review of published research.

ENH 752. Biochemical and Molecular Toxicology. 3 Hours.
This advanced course serves to equip students to understand at the molecular and cellular levels how environmental and occupational agents exert their toxic properties against specific genetic backgrounds. This course assumes a strong foundational knowledge of cell biology, RNA and DNA metabolism, and gene function, structure and regulation. This course will prepare students to apply advanced toxicology principles to agents of disease in order to understand the molecular mechanism and where interventions may be appropriate. Prerequisite: Admission into a public health or biomedical PhD program or permission of the instructor.

ENH 763. Aerosol Technology. 3 Hours.
Defines properties and behavior of aerosols from industrial hygiene and environmental perspectives. Reviews fundamental particle descriptions and critical fluid properties affecting particle behavior. Methods of defining particle size and particle behavior. Methods of defining particle size and size distribution and theories of particle kinetics and their application to particle disposition and collection This multidisciplinary course covers the fundamental principles that govern the formation, growth, measurement and modeling of particles behavior (both ambient and nanoparticles) with direct application to health sciences and engineering specialties. The course explores the quantitative evaluation of aerosol behavior including the physical and chemical parameters that govern it. Specific applications of atmospheric and occupational aerosol, bioaerosol and nanoparticles are included to link fundamental knowledge to practical implications in industrial hygiene, national security and materials technology.

ENH 770. Advanced Topics in Environmental Disasters in PUH. 3 Hours.
Examines emerging public health challenges posed by incidents involving chemicals, radiation and biological agents. Students are provided with the opportunity to undertake guided research on current topics in the field and discuss their findings with graduate students and faculty members. Course will be graded by letter. Prerequisites: ENH 610 [Min Grade: C] NOTE: If course prerequisite of ENH 610 is not met, permission of instructor is required.
Prerequisites: ENH 610 [Min Grade: C](Can be taken Concurrently)

ENH 781. Journal Club. 1 Hour.
The purpose of this course is to provide a forum in which students become comfortable critically reviewing recent refereed publications in the fields of environmental health, toxicology, occupational health, and industrial hygiene. Students will also be expected to become comfortable answering and asking questions in a scientific setting.

ENH 790. Seminar: Current Topics in ENH Sciences Research. 1 Hour.
Interactive forum in which graduate students and faculty discuss dissertation research projects and topics related to the field of Environmental Health Sciences Research through presentation of journal articles. Course is designed to develop oral communication skills for presenting scientific material to peer groups. Presentations by graduate students are followed by discussion and questions. Preq: Permission of instructor required.

ENH 796. Environmental Toxicology Laboratory Rotations. 3 Hours.
Doctoral laboratory rotations in Environmental Health Sciences. Required for First and Second year PhD students in the Industrial Hygiene and Environmental Management and Policy foci. Preq: Permission of instructor required.

ENH 798. Doctoral Level Directed Res. 1-9 Hour.
Independent study with guidance of appropriate faculty.

ENH 799. Dissertation Research. 1-9 Hour.
Research for dissertation under the direction of the dissertation committee. Preq: Must be admitted to candidacy before registering for this course.
Prerequisites: GAC Z

EPI-Epidemiology Courses

EPI 600. Introduction to Epidemiology. 3 Hours.
EPI 600 is an introductory course designed to teach graduate level public health students the basic principles, methods, and applications of epidemiology. This course is a CORE requirement for non-Epidemiology MPH majors.

EPI 602. Epidemiology of Chronic Diseases. 3 Hours.
This course will explore the breadth and depth of the epidemiology of chronic diseases including classification, surveillance, frequency, distribution, etiology, natural history, risk factors, and control. It will address details of large-scale epidemiologic studies in cardiovascular diseases and cancer, and will discuss epidemiologic papers relating to the use of various study designs. The course will be presented in three modules: (1) Overview, Risk Factors and Control of Chronic Diseases; (2) Epidemiology of Cardiovascular Diseases; (3) Epidemiology of Cancer; and Other Chronic Diseases. Besides the course master, guest lecturers will participate in teaching the course.
Prerequisites: EPI 610 [Min Grade: C] or EPI 610Q [Min Grade: C]

EPI 603. Injury-Epidemiologic Principles and Prevention Strategies. 3 Hours.
Concepts and methods of epidemiology applied to injury; epidemiology of major injury types, utilization of injury data sets; development and evaluation techniques of preventive strategies. EPI 600 or EPI 610 is a recommended prerequisite but is not required.

EPI 605. Epidemiology of Infectious Diseases. 3 Hours.
The course provides an introduction to basic principles of infectious disease epidemiology, surveillance, and control. Time is also dedicated to critical analysis of the magnitude, distribution, risk factors, and public health significance of selected infectious diseases in community and institutional settings. While the primary geographic focus is the U.S., international comparisons and perspectives are included. The course focuses on the major infectious diseases affecting developing nations and on diseases of major current interest. The course also provides an overview of vaccinology principles, current immunization strategies, their public health rationale, and use of vaccines in disease control and eradication.
Prerequisites: EPI 610 [Min Grade: C]

EPI 607. Fundamentals of Clinical Research. 3 Hours.
This course will provide an overview of principles and practices related to the study of determinants and outcomes of medical interventions. Methods for conducting epidemiologic research in the "clinic", assessing the validity of diagnostic and screening tests, measuring therapeutic efficacy and safety, and describing the natural history of disease will be reviewed. EPI 600 or EPI 610 is a recommended prerequisite but not required.

EPI 609. Introduction to Pharmacoepidemiology and Drug Safety. 3 Hours.
The purpose of the course is to 1) introduce to students the emerging field of pharmacoepidemiology (PE) and comparative effectiveness research (CER); 2) to have an overview of the shared and unique methodological issues that commonly and negatively affects the validity and interpretation of PE and CER research; and 3) to introduce methods in study design and data analysis to address such issues. The course is a requirement for the MSPH Pharmacoepidemiology and Comparative Effectiveness Research track. NOTE: Introductory training in epidemiology (EPI 610 or BST 611) is recommended but not required.

EPI 610. Principles of Epidemiologic Research. 3 Hours.
Concepts, philosophy, and methods of epidemiology. Measures of disease frequency, association and impact; study design and data analysis, indices of disease and health; overview of major categories of acute and chronic disease, outbreak investigations, and screening. EPI 610 is a track requirement for MPH - Epidemiology and MSPH – Epidemiology majors, and is also open to other graduate students at the instructor’s discretion.

EPI 614. Epidemiologic Methods Applied to Comparative Effectiveness Research. 3 Hours.
This course will focus on methodological issues pertaining to the design, analysis and interpretation of comparative effectiveness research studies. Special focus will be placed on comparative effectiveness research studies using a non-experimental design and large data base analyses. This course is intended for Master of Science in Public Health and doctoral students in epidemiology, biostatistics, or health care and policy. Doctoral students in other disciplines as well as others interested in comparative effectiveness research are also welcome to enroll with the instructor's permission.
Prerequisites: EPI 610 [Min Grade: C] or EPI 610Q [Min Grade: C]

EPI 616. Environmental Epidemiology. 3 Hours.
Design and conduct of studies examining health effects of environmental exposures. Strengths and limitations of research strategies and interpretation of study results. Areas of interest include air and water pollution, lead, and biological marker outcomes.
Prerequisites: EPI 610 [Min Grade: C]

EPI 618. Fieldwork in Public Health. 2 Hours.
Application of public health principles in communicable disease control and environmental health programs carried out at Jefferson County Department of Health.
Prerequisites: EPI 605 [Min Grade: C] and EPI 610 [Min Grade: C]

EPI 619. Infection Prevention and Hospital Epidemiology. 3 Hours.
The course will provide students with a basic understanding of the area of hospital epidemiology and infection prevention. Notably, the course will cover a review of basic epidemiological methodology, and will then focus on the main areas of surveillance that are critical to infection prevention in addition to methodologies that are specific to hospital epidemiology. Prerequisites: EPI 610 or equivalent introduction to epidemiology course as approved by the course director.
Prerequisites: EPI 610 [Min Grade: C]

EPI 621. HIV/AIDS and STDs. 3 Hours.
Basic biology and pathogenesis, historical and current trends, domestic and international epidemiology, determinants of spread, immunogenetics and host susceptibility, options for prevention, surveillance and control of sexually transmitted diseases (STD's) and HIV/AIDS. If not Public Health student permission of instructor is required.
Prerequisites: EPI 610 [Min Grade: C] or EPI 610Q [Min Grade: C]

EPI 622. An Introduction to REDCap (Research Electronic Data Capture). 3 Hours.
The purpose of this course is to introduce students to the principles of database design and management using REDCap. The course will use the University of Alabama at Birmingham’s response to the COVID-19 pandemic as a case study. The course will provide students with an overview of the principles of and best practices for data collection and management as well as the skills to develop and maintain a database using REDCap. The specific skills to be acquired include creating database forms and fields, creating field validation rules, creating centralized and distributed data collection systems, creating reports, importing and exporting data, quality assurance and control procedures, among others. SAS will be used to illustrate REDCap’s ability to interface with other software packages to facilitate data analysis and report; however, students need not have experience using SAS. The course will also briefly review other database tools include Microsoft Access and Filemaker Pro.

EPI 624. Introduction to Data Analysis with SAS. 2 Hours.
The purpose of this course is to introduce students to the basics of SAS programming. Topics covered will include creation/importation of datasets, working with SAS variables, manipulation of datasets (e.g., combining and subsetting datasets), and SAS syntax to produce descriptive statistics (e.g., frequencies, means) and perform basic statistical procedures (e.g., chi-square, t-test).
Prerequisites: EPI 610 [Min Grade: C] or EPI 610Q [Min Grade: C]

EPI 625. Quantitative Methods in Epidemiology. 3 Hours.
The course will provide students with the knowledge of how to perform basic analyses utilized in epidemiological research. The course will segmented into four modules, with three modules covering how to properly analyze ecological, cross-sectional, cohort, and case control study designs. The course will focus heavily on performing the analyses in SAS, and will continue to expand upon many of the concepts in SAS programming covered in EPI 624. The statistical methods covered will include, but are not limited to, bivariate analyses such as chi-square, t-test, and ANOVA; correlation; and regression methods such as logistic regression, Poisson regression, and Cox proportional hazards regression.

Prerequisites: BST 611 [Min Grade: C] and BST 612 [Min Grade: C] and (EPI 610 [Min Grade: C] or EPI 610Q [Min Grade: C]) and EPI 624 [Min Grade: C]

EPI 627. Data Analysis and Presentation of Epidemiologic Studies. 3 Hours.
Analyze data from an epidemiologic study, addressing a specific questions, and prepare a manuscript from the analysis. There are 3 possibilities regarding choice of data: 1) from a list of the instructor's datasets, 2) public use data, 3) from the student's research. Students working on an MSPH or another degree project may use data for that degree-project with approval of their advisor and course master. Upon completion of the course, the student should be able to analyze data from an epidemiologic study and prepare a manuscript.
Prerequisites: BST 611 [Min Grade: C] and BST 612 [Min Grade: C] and EPI 610 [Min Grade: C] and EPI 624 [Min Grade: C] and EPI 625 [Min Grade: C]

EPI 635. Genetics in Public Health. 2 Hours.
This course will provide a topical overview of issues in public health genetics. The purpose of this course is to introduce students to the complex issues involved in applying and integrating genetic technology and information into public health. Must have permission of instructor to register.

EPI 680. Topics in Clinical Research. 2 Hours.
Provide health sciences professionals interested in clinical trials, clinical epidemiology, and other forms of population research with both essential principles and specific technical knowledge in a variety of areas relevant to the conduct of biological and behavioral investigation of human subjects. NOTE: Limited to health professionals planning clinical research careers who have been accepted into the MSPH in Clinical Research. This course begins in the Spring term and extends into the Summer term. Registration for this course is during the Summer semester. Please contact the Program Coordinator for the course syllabus and course schedule.

EPI 681. Special Topics in Epidemiology Research. 1-3 Hour.
To engage infectious disease research practice encompassing design, conduct, analysis, and interpretation. Students participate in supervised research and/or in research design. Doctoral students are expected to engage in supervised research. NOTE: Permission of instructor.

EPI 682. Gorgas Course in Tropical Med. 3-9 Hours.
Hands-on exposure to tropical diseases and emerging pathogens in various teaching formats: didactic lectures, roundtables, laboratory work, clinical and hospital rounds, case conferences, computer training, field fied trips and independent study. Course is held in during the Spring Term in in Lima, Peru. NOTE:9 hours (3 or Course can be taken for 3, 6 hours are also accepted with or 9 hours; however, evaluation will be restricted to selected sections of the course). course. Spring (Freedman).

EPI 689. Epidemiology Integrative Learning Experience. 3 Hours.
The EPI ILE or capstone course represents a culminating experience that allows students to demonstrate synthesis of MPH foundational and epidemiology concentration competencies. Students will apply their epidemiology and biostatistics skills by designing, analyzing, and disseminating findings of a research project in the form of a high-quality written product. All MPH Epidemiology students must complete this course to graduate in the final term of the MPH program.
Prerequisites: EPI 625 [Min Grade: C] and PUH 688 [Min Grade: C]

EPI 690. Population and Health Outcomes Research Seminar Series. 1 Hour.
The purpose of this class is to provide an opportunity for students interested in population and health outcomes research to participate in seminars related to methodology and career development and to present their work.

EPI 695. Seminar on Selected Environmental Health Topics. 1-9 Hour.
This course will be used as faculty design and craft course topics based on specific interests. These courses will be taught on a masters level.

EPI 698. Master's Level Directed Research Epidemiology. 1-9 Hour.
Independent study with guidance of appropriate public health faculty.

EPI 699. Master's Level Project Research Epidemiology. 1-9 Hour.
Research for project under direction of research committee.
Prerequisites: GAC M

EPI 703. Grant Proposal Writing. 3 Hours.
To provide the student with information about grant writing and practice in preparing a grant proposal for submission. The proposal must relate to an epidemiologic topic. Human subjects issues are discussed. NOTE: Must be a doctoral student or obtain permission of instructor to enroll.

EPI 704. Advanced Epidemiologic Methods. 3 Hours.
This course provides an advanced introduction to fundamental epidemiologic concepts and methods, including causal inference, bias, and study design. This course is the first course in the sequence of the three required core epidemiology courses for doctoral students in epidemiology.

EPI 706. The Epidemiology of Cardiovascular Disease. 2 Hours.
The purpose of this course is to provide exposure to the epidemiology of cardiovascular disease.

EPI 710. Analysis of Case Control Studies. 3 Hours.
This course is designed to provide doctoral students in epidemiology with practical experience in the analysis and interpretation of data from case-control studies. Specific aims are: To outline a strategy for data analysis and review relevant methodologic issues and to apply stratified analysis methods and regression models in the study of diseases of multifactorial etiology. Preq: Requires permission of instructor.
Prerequisites: EPI 704 [Min Grade: C]

EPI 712. Nutritional Epidemiology. 3 Hours.
Nutritional epidemiology will cover core concepts in human nutrition including nutrient classification, nutrient sources, nutritional deficiencies, nutritional excesses, recommended daily allowances, basic anthropometry, dietary assessment methods in free-living populations, validation of dietary assessment methods, identification of biomarkers of dietary intake, study designs used in nutritional epidemiology, issues in the analysis and presentation of dietary data, diet-disease associations, gene-diet associations and special topics in nutrition (e.g., folic acid and neural tube defects, fatty acids and the metabolic syndrome, diet and obesity, vitamin A and immune function, vitamins and mother-to-child transmission of HIV, etc).

EPI 713. Cancer Epidemiology and Control. 3 Hours.
In this course students will learn what is known about the causes of cancer and the control measures used to decrease cancer incidence, decrease cancer mortality, extend cancer survival, and improve quality of life for cancer patients.

EPI 720. Analysis of Follow-Up Studies. 3 Hours.
This course is designed to provide doctoral students in epidemiology with practical experience in the analysis and interprestation of data from follow-up studies. Specific aims are: to outline a strategy for data analysis and review relevant methodologic issues and to apply stratified analysis methods and regression modles in the study of diseases of multifactorial etiology.
Prerequisites: EPI 710 [Min Grade: C]

EPI 721. HIV/AIDS and STDs. 3 Hours.
The course will cover the epidemiology, prevention and control of Sexually Transmitted Diseases (STDs) including the human immune deficiency virus (HIV) infection in both the domestic and international settings. EPI 621 is intended as an elective for second year students and students who have a graduate degree in the Medical Health Professions who are enrolled in any degree track in the School of Public Health. It is considered an elective for the MPH and MSPH programs in Epidemiology. EPI 721 is intended only for doctoral students in the School of Public Health.
Prerequisites: EPI 610 [Min Grade: C] or EPI 610Q [Min Grade: C]

EPI 731. Genetic Epidemiology. 4 Hours.
This course will cover core concepts of designs, methods and statistical tools in genetic epidemiology studies for determining the contribution of genes to disease risk. Methods for incorporating genetic markers into conventional epidemiologic study desgins as risk factors including genetic risk models, familial correlations, migration and admixture, quantitaitve and qualtative traits, association and linkage analyses in family based designs, allele/haplotype frequency estimation, Hardy Weinberg Equilibrium and linkage disequilibrium and application in both family and population based studies will be discussed. Methods for gene-gene and gene-environment interaction assessment, genome wide association studies are also presented. Students not meeting the prerequisites must get permission from the instructor.
Prerequisites: EPI 610 [Min Grade: C] and BST 611 [Min Grade: C] or BST 621 [Min Grade: C]

EPI 781. Special Topics in Epidemiology Research. 3 Hours.
To engage infectious disease research practice, encompassing design, conduct, analysis, and interpretation. Students participate in supervised research and/or in research design.NOTE: Doctoral students are expected to engage in supervised research and must obtain permission of instructor.

EPI 790. Doctoral Seminar in Epidemiology. 2 Hours.
In depth study of several areas of epidemiologic methodology not covered in other courses. Students responsible for selecting and presenting topics. Considerable reading and outside preparation required. NOTE: Requires permission of instructor.

EPI 795. Epidemiology Seminar. 1 Hour.
The purpose of the epidemiology seminar series is to provide a venue for faculty and students of epidemiology to participate in the presentation of a variety of topics and concepts related to the field of epidemiology, biostatistics and public health.

EPI 798. Doctoral Level Directed Research Epidemiology. 1-9 Hour.
Independent study with guidance of appropriate faculty.

EPI 799. Dissertation Research. 1-9 Hour.
Research for dissertation under direction of dissertation committee.
Prerequisites: GAC Z

GHS-Global Health Studies Courses

GHS 600. Fundamentals of Global Health. 3 Hours.
This course is designed to introduce students to the foundations of global health programs, policies and practices. Students will explore the history of the field of global health, including its roots in colonial exploration, tropical medicine, and imperialism, and the current paradigms shifting the field to a collaborative and transnational effort to improve health equity for all and reduce the global burden of diseases. The course will emphasize the main concepts necessary to examine the critical links between health outcomes and social, environmental, and economic determinants at multiple levels of scale and across low, middle, and high -income countries. The course will be global in coverage but will a focus on the burden of disease in low- and middle-income countries and on the health of the poor in low-resource or resource-scarce settings.

GHS 601. Global Health Partnerships and Development. 3 Hours.
Global health is an emerging and evolving field of health research and practice. Working in global health means that researchers, practitioners, and advocates work alongside and within a complex system of governance that has emerged over time and in response to very significant global health events. This course offers a critical analysis of global health programs and partnership initiatives over time and their impact on health and development. Using a historical lens to examine the growth of global health as a field of research and practice, this course examines the very significant paradigm shift from the field of international health to global health. By exploring key historical events and interventions, this course also explores why global health diplomacy is so important to cooperation among countries as well as global health security and how global health programs are funded, and programs and initiatives are implemented in various bilateral, multilateral, and private-public partnerships.

GHS 603. Immigrant, Migrant, Refugee Health. 3 Hours.
This course will introduce students to the inter-relationships between migration and health, focusing on the myriad of health issues experienced by migrant populations. The course will focus on both communicable and non-communicable health issues among migrating populations. The course will examine health issues among all types of migrant populations with a particular focus on the categories of ‘displaced peoples’, and the resultant state and humanitarian responses surrounding health and social (public health) services. This course frames global health in broad terms to include the underlying social and economic conditions, including climate change, economic underdevelopment, and political instability, which displace people, or motivates them to migrate, and which present barriers to achieving health, mental health, and wellbeing in immigrant, migrant, and refugee communities. We explore how violence, social suffering, health, disease, and mental health are intertwined with displacement and migration.

GHS 604. Infectious Diseases of Global Health Significance. 3 Hours.
The purpose of this course is to equip participants with up-to-date knowledge of global pandemic preparedness and control measures necessary to protect present and future generations. This course will expose students to Global Health agreements such as the pandemic treaty and International Health regulations. The course also challenges students to find new innovative strategies for the prevention of the big 3 (HIV, TB & Malaria) infectious diseases and familiarize students with global health priorities. To achieve this, the course will introduce concepts of disease infectious disease transmission and disease transmission dynamics and introduce the principles of global health security. The course adopts multidisciplinary, interdisciplinary, and transdisciplinary perspectives in studying the factors that contribute to the impact of pandemics and major outbreaks using Smallpox, malaria, and COVID-19 as an important historical lens. Students will explore some of the WTO policies that facilitate or preclude the discovery of vaccines and distribution of vaccines and medical commodities during pandemics. Throughout the course, emphasis will be placed on equity, one health, and universal health coverage.

GHS 605. Disabilities and Global Health. 3 Hours.
This course explores current paradigms and models for defining and categorizing disability based on various international agreements and documents.

GHS 606. Critical Issues in Global Maternal and Child Health. 3 Hours.
This course is an elective module for students enrolled in UAB Certificate in Global Health program. Mothers and children in developing countries are among the most vulnerable and disadvantaged sectors of the world's population. This course defines the Maternal and Child Health (MCH) discipline, describes the current practices and challenges, and compares global strategies and potential solutions.

GHS 607. Global Health and Gender. 3 Hours.
Sex and gender are both important determinants of health. Biological sex and socially constructed gender interact to produce differential risks and vulnerability to ill health, differences in health seeking behavior, in health care providers' response and in health outcomes for women and men. Gender differences in morbidity and mortality represent `avoidable¿ and/or `unfair¿ inequalities in health. Because gender is socially constructed, gender-based inequities in health are amenable to policy and program interventions. This course is designed to help public health students, policy makers, health care providers and health researchers understand concepts related to gender and to apply them in an analysis of specific policies and programs. The course will enable participants to identify the gendered nature of issues like violence and sexuality and how these affect health. The course provides participants with support to apply a gender perspective to program planning, policy analysis, or a research design as part of their final assignment.

GHS 608. Food and Nutrition in Resource Limited Settings. 2 Hours.
This course will provide to graduate and professional students a general overview of the facts, research finding underlying nutrition and the relationships to acute and chronic diseases worldwide and their impact productivity and economic development.

GHS 609. Environmental Health in Resource Limited Settings. 3 Hours.
Demonstrate an understanding and appreciation of the complex roles played by the environment as a major determinant of health and identify the major environmental health issues confronting populations in a resource-limited setting.

GHS 610. Refugee Health Care. 3 Hours.
This course is one of the elective courses of the UAB Global Health Studies Certificate program, and is designed for professionals undertaking the GHS continuing education certificate as well as UAB graduate students enrolled in the GHS graduate certificate program. The course addresses the issues of refugees and the agencies concerned with their protection, human rights, and coordination and provision of care.

GHS 611. International NGO Management. 3 Hours.
The course addresses issues for managers of NGOs primarily at the field level of operation with special emphasis on project management. It begins with the history of international organizations and their roles in aid, development, and human rights. It follows with analysis of NGO organizational structure and function, roles, and the responsibilities of various stakeholders at the macro and micro level. Project development, planning, implementation, and evaluation will be addressed. Management principles and skills will also include budget preparation and staff/human resource management.

GHS 620. Infect Dis Surveillane & Contr. 3 Hours.
The primary focus of the course is vector ecology and biology, infectious disease surveillance and control, and water and sanitation in a developing country, with an emphasis on field and community-based learning. This class will take place in Jamaica and you must be accepted by the Sparkman Center for Global Health.

GHS 629. Intensive Global Health Training - SIFAT. 3 Hours.
Become a better Global Citizen by learning critical issues on Household Energy use in the developing world that affect health, environmental sustainability, gender equity, economics, and the development of millions of families and communities globally. Learn what you can do to make a difference. Be a part of the solution for a better world!.

GHS 630. Field Training in World Hunger and Malnutrition: Practical Skills to Make a Difference. 3-6 Hours.
This two week intensive field training course will take place at SIFAT's 176-acre international training campus in Lineville, AL. Students will attend didactic sessions and participate in hands on activities and simulations. SIFAT trainers are experienced in international development and cross-cultural dynamics. On-site Field Training.

GHS 645. Comparative Health Systems and Policy. 3 Hours.
This course provides a comprehensive survey of a number of healthcare systems from low-, middle-, and high-income countries, situating the U.S. and other national experiences in a comparative cross-national frame. The course provides frameworks for students to analyze in diverse settings the different ways that health policy is developed and implemented, given the resources, capacities, and systems of each country. The course will also examine the ways in which health care is organized and delivered, along with underlying global public health principles and impacts. By comparing health systems and policies, globally, students will reflect on how a country's social-historical context and values, geography, polity, and economy influence the way that health care is provided and its relationship with population health, as well as how health policies influence the quality of life.

GHS 649. Interprofessional Global Health Service Learning. 3 Hours.
This course provides students with an opportunity to work in small teams to address a global health problem in collaboration with a community partner. The global health problem to be addressed can be at a local site (with a local agency or partner), a site within the US, or an international site (with a US or non-domestic agency or partner). Interprofessional teams of 4-6 graduate and professional students will apply concepts and theories related to global health, interprofessional collaboration, team building, leadership, community partnerships, business models, and appropriate framework for developing and implementing a plan to address a specific global health problem with a community partner.

GHS 690. Special Topics in Global Health. 1-6 Hour.
This special topic course will be used in the graduate global health certificate program to cover emerging issues or specialized content not represented in the main curriculum. Prerequisites: Permission of instructor; other prerequisites may be required.

HB-Health Behavior Courses

HB 600. Social and Behavioral Sciences in Public Health. 3 Hours.
Social and behavioral science theories and strategies in public health will be discussed in relation to preventing disease and promoting health over the life course. The course is comprised of two major sections: (1) overview of fundamentals of social and behavioral sciences in public health and (2) social and behavioral science research and strategies and application of social and behavioral sciences in public health practice and policy.

HB 601. LGBTQ Research Methods. 3 Hours.
The purpose of this course is to provide focused training in methods relating to LGBTQ health. Students taking the course will be provided research skills to assess and address the factors driving SGM risk and resilience in general, with attention to intersectional identities (e.g., race and ethnicity, age, ability, region, religion, and rurality). In addition to building research skills, the course will include topics such as 'equitable budgetary practices,' enabling students to meaningfully and equitably engage community partners throughout the research cycle.
Prerequisites: HB 607 [Min Grade: C] or HB 707 [Min Grade: C]

HB 602. Alcohol and Drug Abuse. 3 Hours.
History and theory of human substance use and abuse. Empirical foundations of alcohol and drug abuse, diagnosis, assessment, treatment, and prevention. Course will be graded by letter. 3 hours.

HB 603. Obesity Prevention & Intervention. 3 Hours.
The aim of this course is to provide students with theoretical and practical knowledge required to develop, implement, and evaluate obesity intervention and prevention programs. The course covers both pediatric and adult obesity intervention and prevention with a focus on lifestyle (dietary intake, physical activity) and environmental factors. Course will be graded by letter. 3 hours.

HB 604. LGBTQ Health and Wellbeing Service Learning. 3 Hours.
The service-learning course will examine LGBTQ health and wellbeing. Specifically, it will take the knowledge learned from courses associated with the LGBTQ health and wellbeing certificate program and enable the students the opportunities to put it into practice. Students will have a range of opportunities to explore what LGBTQ health and wellbeing looks like in practice. Topics include issues related to LGBTQ risk and resilience, policy and programmatic approaches to LGBTQ health and health and wellbeing, as well as the concrete advocacy and leadership skills needed to address the most pressing inequities faced by LGBQ communities in Alabama and the Deep South.
Prerequisites: HB 607 [Min Grade: C] or HB 707 [Min Grade: C]

HB 605. Physical Activity in Public Health. 3 Hours.
This seminar course is an introduction to research and practice related to physical activity promotion from a public health perspective and will describe health benefits, epidemiological data, national recommendations and plans, and global initiatives related to physical activity. Course will be graded by letter. 3 hours.

HB 607. Introduction to LGBTQ Health. 3 Hours.
This course will survey current LGBTQ health topics, including: 1) Defining evolving terms and concepts; 2) Risk and resilience - physical, mental, and behavioral health among LGBTQ individuals; 3) Theories guiding LGBTQ research; 4) Analytic considerations when conducting LGBTQ health inequity research; 5) Ways to improve the provision of services for LGBTQ individuals; 6) Overview of key, local, national, and global policies impacting LGBTQ individuals; and 7) Meaningful integration of LGBTQ communities in policy, programs, and research.

HB 609. African-American Health Issues. 3 Hours.
This is an intermediate level course that focuses on: epidemiological data illustrating the health risks experienced by African-Americans; sociocultural factors essential for understanding and enhancing the health of African-Americans; effective health-related prevention programs for African-Americans.

HB 611. Mental Health as a Public Health Issue. 3 Hours.
This course is designed to increase knowledge of mental illness at the individual, community, and population levels. It also covers historical and contemporary models and research on the etiology, diagnosis, assessment, treatment and prevention of mental and other behavioral health disorders.

HB 612. Examining Health Inequities in Social and Behavioral Sciences. 3 Hours.
This course is designed to provide a comprehensive overview of race/ethnic health disparities/health inequities in the U.S. Both historical context and more current perspectives of identified determinants of health will be discussed as contributors to current health inequities.

HB 613. Health Promotion Practices and Disability. 3 Hours.
This course will examine the population of people living with a disability and health promotion approaches at multiple levels (individual, social, environmental, and policy). One in five people in the U.S. has a disability and many people will be affected by disability, whether personally or through a loved one, during their lifetime. Advancements have been offered by the medical model of disability towards disability prevention; however, the addition of functional and social models of disability provide a more complete view of how to enhance the lives of millions of Americans and reduce economic burden.

HB 615. Homelessness, Housing and Health. 3 Hours.
The course will begin with a discussion of the concept of homelessness and housing instability and their impact on health. We will discuss how homelessness is defined and enumerated, pathways into homelessness, and multi-level interventions to prevent and end homelessness. We will also explore a series of special topics focusing on populations that may be particularly vulnerable to homelessness as well as the intersection between homelessness and experience of particular health conditions and outcomes.

HB 616. Psychophysiology and Public Health: The Interface of the Mind/Body Connection. 3 Hours.
Psychophysiology is a branch of neuroscience that analyses the interfaces of mental states and physiological responses, and how they interact to affect one another and subsequently drive behaviors. This course introduces students to basic knowledge about neuroanatomy, learning/cognition, neurological processes, memory, human development, brain disorders, response patterns, and behavior change strategies as they relate to public health issues such as sexual behavior, drug addiction, cigarette smoking/vaping, and obesity. The course will also introduce principles of stress management and neurofeedback techniques. A biopsychosocial framework will be applied to a range of public health domains, using Maslow's Hierarchy of Needs to inform context and priorities for interventions.
Prerequisites: HB 624 [Min Grade: C] or HB 624Q [Min Grade: C]

HB 617. Implementation Science and Disability Health. 3 Hours.
The course provides lectures on implementation science and a deep dive into a premier, national program for people with disability. Implementation science helps researchers to understand how and why a program is effective in order for it to be translated into practice. Students will gain a better understanding of when and how to use implementation science methods through a series of lectures and multiple assignments including a grant proposal. In addition, this course provides experiential learning opportunities in disability health and community engagement.

HB 618. Suicide Prevention. 3 Hours.
This course will explore the science of suicide prevention. Topics will include exploring the science of suicide through the five pillars of public health, including epidemiology, biostatistics, environmental health, health care organization & policy, and health behavior. Students will also become certified in QPR Gatekeeper training and be responsible for the development of a public health communications project.

HB 624. Advanced Social and Behavioral Science Theory. 3 Hours.
The aim of this course is to provide students with a broad understanding of theories of health behavior change with a strong focus on those theories that are most widely used in research and practice. Emphasis will be given to the discussion and elaboration of important theoretical concepts as well as their application in specific health behavior interventions. This class will take an ecological perspective and discuss theories that approach behavior change from various different levels. Basic theories that are covered in this course include individual level models (Health Belief Model, Theory of Planned Behavior, Transtheoretical Model), interpersonal level models (Social Cognitive Theory), and community level models (community organization and other participatory models like Community Based Participatory Research, Diffusion of Innovations). 3 hours.

HB 625. Dissemination and Implementation in Health. 3 Hours.
The course will offer an introduction to dissemination and implementation science, an interdisciplinary field focused on improving the transition of evidence-based health practices, programs, and interventions from research studies into "real-world" settings.
Prerequisites: HB 600 [Min Grade: C]

HB 630. Health Communications: Theory and Practice. 3 Hours.
This course is designed to investigate the role of communication theories and methods in promoting public health and preventing disease. Both theoretical background in communication and behavioral science and practical communication/intervention development methods will be addressed.

HB 636. Developing Interventions to Promote Public Health. 3 Hours.
This course is intended to provide students with a comprehensive understanding of the range and diversity of intervention approaches to behavior change and their application in public health. Emphasis will be placed on developing skills for designing interventions: a) in various public health settings, b) for specific population subgroups, c) based on determinants identified to be most influential and amenable to intervention, and d) within the confines of available resources.
Prerequisites: HB 624 [Min Grade: C] or HB 624Q [Min Grade: C]

HB 639. Survey Design and Analysis in the Social and Behavioral Sciences. 3 Hours.
This course provides an in-depth treatment of survey design and elementary data analysis procedures commonly associated with social and behavioral research. What are the best practices for asking individuals potentially uncomfortable questions about risky health behaviors? How do we measure the reliability and validity of self-reported behaviors? This course addresses these issues in addition to those of sampling hard-to-reach populations, best practices in questionnaire design, an overview of index and scale construction, and an elementary introduction to data entry and analysis of survey data using common software packages.

HB 641. Research Methods in Behavioral Science. 3 Hours.
Review of research methodology in behavioral sciences. Formulation of research questions, causality, experimental and quasi-experimental designs, reliability and validity, reporting findings. Course will be graded by letter.

HB 643. Health Program Evaluation. 3 Hours.
Principles and procedures to evaluate health promotion/disease prevention programs: data collection methods, instrument-scale development, measurement, evaluation designs and analysis of case studies of disease prevention literature on evaluation.
Prerequisites: HB 641 [Min Grade: C] or HB 641Q [Min Grade: C]

HB 660. Adolescent Health: A Social and Behavioral Perspective. 3 Hours.
Designed to provide students with the most current knowledge and analysis of issues influencing the health and well-being of adolescents. Theoretical frameworks that draw on an ecological perspective will provide a better understanding of how families, peers, schools, and neighborhoods influence risk and protective factors in youth. Emphasis will be placed on the relevance of adolescent health issues for the science of Health Behavior and the broader public health arena.

HB 681. MSPH Directed Research I. 3 Hours.
MSPH Directed Research I provides MSPH students with the opportunity to work closely with a faculty mentor in the design of a health behavior intervention and collection of data. This course is the first in a three-course sequence that culminates in the presentation of research findings to their faculty mentor and other faculty in a public forum. As such, HB 681 focuses on the development of a health behavior intervention in an area of the student's expertise, including consideration of the PRECEDE/PROCEED model, study population, data collection methods, IRB approval, study registration, previous research, and other activities in consultation with their HB mentor.

HB 682. MSPH Directed Research II. 3 Hours.
MSPH Directed Research II provides MSPH students with the opportunity to work closely with a faculty mentor in the design of a health behavior intervention and collection of data. This course is the second in a three-course sequence that culminates in the presentation of research findings to their faculty mentor and other faculty in a public forum. As such, HB 682 focuses on collection and analysis of data, interpretation of results, and significant progress in the drafting of a scientific manuscript reporting the research project and preliminary results, and other activities in consultation with their HB mentor.
Prerequisites: HB 681 [Min Grade: P]

HB 683. MSPH Directed Research III. 3 Hours.
MSPH Directed Research III provides MSPH students with the opportunity to work closely with a faculty mentor in the design of a health behavior intervention and collection of data. This course is the third in a three-course sequence that culminates in the presentation of research findings to their faculty mentor and other faculty in a public forum. As such, HB 683 focuses on analysis of data, interpretation of results, completion of a scientific manuscript reporting the research project and preliminary results, other activities in consultation with their HB mentor, and the presentation of results in a public forum.
Prerequisites: HB 681 [Min Grade: P] and HB 682 [Min Grade: P]

HB 689. Health Behavior Integrative Learning Experience. 2 Hours.
The HB ILE or capstone course represents a culminating experience that allows students to demonstrate synthesis of foundational and concentration competencies. This course will provide students with the opportunity to use skills gained during the MPH Health Behavior program to develop a high-quality written product that addresses health disparities from a behavioral and social sciences perspective and is ideally useful for an identified stakeholder. All MPH Health Behavior students must complete this course to graduate in the final term of the MPH program.
Prerequisites: PUH 688 [Min Grade: C]

HB 692. Principles and Practices of Community Organization. 3 Hours.
Seminar designed as an integrative experience for persons working with community groups. The focus is on learning to use available resources and advocating change to maximize community involvement.

HB 695. Seminar on Selected Health Behavior Topics. 1-3 Hour.
Seminar covering a variety of health behavior topics.

HB 698. Master's Level Directed Research Health Education. 1-9 Hour.
Independent study with guidance of appropriate faculty. Includes activities such as literature review and evaluation. Course will be graded as Pass/No Pass. 1 - 9 hours.

HB 699. Master's Level Project Research Health Education. 1-9 Hour.
Research for project under direction of research project committee. Course will be graded as Pass/No Pass. 3-6 hours.
Prerequisites: GAC M

HB 701. Theory-Based Measurement Development. 3 Hours.
The aim of this course is to introduce students to measurement development based on well-specified behavioral theories. This course will review and discuss key issues related to measurement development such as item/scale development, number of factors to retain rotation options and statistical programs. Prerequisite: Requires knowledge of elementary probability and statistics for non-statistics majors and BST 611. Course will be graded by letter. 3 hours.
Prerequisites: BST 611 [Min Grade: C]

HB 703. Writing for the Behavioral Sciences. 3 Hours.
The aim of this course is to develop and fine-tune scientific writing proficiency. In this course, students will read and critique a variety of books, essays, and articles about science and medicine, and complete numerous writing assignments and participate in peer review.

HB 707. Introduction to LGBTQ Health. 3 Hours.
This course will survey current LGBTQ health topics, including 1) Defining evolving terms and concepts; 2) Risk and resilience - physical, mental, and behavioral health among LGBTQ individuals; 3) Theories guiding LGBTQ research; 4) Analytic considerations when conducting LGBTQ health inequity research; 5) Ways to improve the provision of services for LGBTQ individuals; 6) Overview of key, local, national, and global policies impacting LGBTQ individuals; and 7) Meaningful integration of LGBTQ communities in policy, programs, and research.

HB 709. African American Health Issues. 3 Hours.
This course will explore issues of both physical and psychological issues of African Americans historically and today. Historical, sociocultural and economic factors that affect the quality and utilization of healthcare services in African American communities will be examined. We will examine the risk and protective factors for specific health conditions. We will also identify evidence-based ways to engage the community and draw on individual and community strengths in prevention and treatment. Students will be equipped and empowered with the knowledge and skills required to develop a Community Action Plan aimed to improve the effectiveness of interventions targeting the African American community.

HB 710. Mental Health Promotion and Professional Development. 1 Hour.
In this course, students will gain knowledge about mental health topics relevant for graduate students, professional students, and postdoctoral fellows and learn skills for managing personal mental health, supporting others' mental health, and intervening when concerned about someone who may be considering suicide. In addition to course credit, students will earn a certificate in QPR Suicide Gatekeeper Training.

HB 711. Advanced Public Mental Health Promotion: Service Learning. 3 Hours.
This advanced course on mental health promotion focuses on evidence-based approaches, innovative service delivery models, and research-practice partnerships to address public mental health. Students acquire skills and hands-on experience related to thinking critically about evidence based approaches, innovative service delivery models, and research-practice partnerships to improve dissemination and implementation.

HB 712. Examining Health Inequities in Social and Behavioral Sciences. 3 Hours.
This course is designed to provide a comprehensive overview of race/ethnic health disparities/health inequities in the U.S. Both historical context and more current perspectives of identified determinants of health will be discussed as contributors to current health inequities.

HB 715. Examining Health Inequities in Social and Behavioral Sciences. 3 Hours.
This course is designed to provide a comprehensive overview of race/ethnic health disparities/health inequities in the U.S. Both historical context and more current perspectives of identified determinants of health will be discussed as contributors to current health inequities.
Prerequisites: HB 641 [Min Grade: C] and HB 643 [Min Grade: C]

HB 716. Psychophysiology and Public Health: The Interface of the Mind/Body Connection. 3 Hours.
Psychophysiology is a branch of neuroscience that analyses the interfaces of mental states and physiological responses, and how they interact to affect one another and subsequently drive behaviors. This course introduces students to basic knowledge about neuroanatomy, learning/cognition, neurological processes, memory, human development, brain disorders, response patterns, and behavior change strategies as they relate to public health issues such as sexual behavior, drug addiction, cigarette smoking/vaping, and obesity. The course will also introduce principles of stress management and neurofeedback techniques. A biopsychosocial framework will be applied to a range of public health domains, using Maslow's Hierarchy of Needs to inform context and priorities for interventions.
Prerequisites: HB 624 [Min Grade: C] or HB 624Q [Min Grade: C]

HB 724. Advanced Social and Behavioral Science Theory. 3 Hours.
This course focuses on a thorough examination of theories and models of behavior change and their applications in both research and implementation in various fields of health promotion and public health. Basic knowledge of research methodology and statistics is required. Course will be graded by letter. 3 hours.

HB 730. Health Communication Research. 3 Hours.
This course is designed to investigate the role of communication theories and methods in promoting public health and preventing disease. Both theoretical background in communication and behavioral science and practical communication/intervention development methods will be addressed.

HB 733. Health, Place, and Society. 3 Hours.
Health, Place, and Society examines social, economic, and political trends within the context of contemporary public health outcomes. Class participants will have a detailed understanding of how the social determinants of health interface with 1) housing policy, 2) employment, 3) education opportunities, 4) economic policy, and 5) social movements. Special emphasis is placed on how these factors follow a measurable pattern affecting intangible outcomes including access to health-enhancing knowledge and tangible outcomes including neighborhood quality and proximity to clean air and healthy foods. Class activities and projects will take a solution-based approach.

HB 736. Advanced Research Intervention Design. 3 Hours.
This course is intended to provide doctoral students with expert knowledge and application skills for designing a range of public health interventions to change behavioral outcomes in various populations. Emphasis will be placed on skill-building for designing relevant, state-of-the-art interventions tailored to unique population subgroups, and adapting existing evidence-based interventions for use with new populations or in new settings. Students will use two textbooks in this course that they will also us in Part 2 of this course (HB-737: Advanced Intervention Implementation and Evaluation). In addition, weekly readings of scientific articles will be assigned. This course uses lecture and seminar format; class time will be structured around lectures, in-class activities, and class discussions of both the lecture and reading materials. Students will complete writing assignments and develop a comprehensive research intervention development and implementation plan that they will later build on and evaluate in HB-737. This course is required for PhD students in Health Behavior.
Prerequisites: HB 724 [Min Grade: C]

HB 737. Advanced Intervention Implementation and Evaluation. 3 Hours.
This course is the second in a series of courses intended to teach doctoral students how to develop, implement, and evaluate theory-based, consumer-driven behavioral interventions. Students will learn how to assess whether interventions worked, build evidence for effective interventions, and adapt, implement, and disseminate interventions. Assignments will include developing a comprehensive evaluation plan for a mock grant application and describing how to adapt an existing evidence-based intervention to a particular content area, outcome target, setting, or population; students will be expected to present their work in class.
Prerequisites: HB 736 [Min Grade: C]

HB 741. Advanced Research Methods in the Behavioral Sciences. 3 Hours.
This course provides an in-depth treatment of the major research designs used in the behavioral sciences. Emphasis is given to the randomized controlled trial as it forms the cornerstone of causal inference in scientific inquiry; however, other designs intended to approximate a randomized trial will be reviewed. The course will also examine methods of collecting, analyzing, and interpreting data. Other topics include evaluating published research that used the methods review in this course, writing research proposals and reports, and ethical considerations. Students must have taken HB 641: Research Methods in Behavioral Sciences or its equivalent as a prerequisite.

HB 742. Mediation and Moderation in Behavioral Science Research. 3 Hours.
This course is an elective course for doctoral students in public health and related fields, designed to provide an exposure to statistical mediation and moderation. Mediation and moderation are central in social and behavioral science research. Mediation explains and tests the underlying mechanisms by which the predictor variable affects the outcome variable, while moderation specifies under what conditions the predictor affects the outcome. Statistical techniques investigating mediation and moderation are among the most widely used data analysis techniques in a variety of disciplines. The primary goal of this course is to provide students with theoretical concepts of mediation and moderation and hands-on experience with relevant analytical techniques. Prerequisite: Students should have taken courses on multiple regression such as BST 611, BST or other equivalent courses. Course will be graded by letter. 3 hours.

HB 770. Doctoral Studies Seminar. 1-3 Hour.
The broad intent of the course is to review current issues relevant to the field of Health Promotion/Health Education, critically examine the relationship between scholarship, research, ethics and funding and reflect and discuss theoretical aspects of Health Promotion/Helath Education.

HB 795. Seminar on Selected Health Behavior Topics. 1-3 Hour.
This course will be used as faculty design and craft course topics based on specific interests. These courses will be taught on a doctoral level.

HB 798. Doctoral-Level Directed Res. 1-9 Hour.
Independent study with guidance of senior public health faculty. Course will be graded as Pass/No Pass. 1 - 9 hours.

HB 799. Doctoral Dissertation Research. 1-9 Hour.
Research for dissertation under direction of dissertation committee. Course will be graded as Pass/No Pass. Prerequisite: Students must be admitted to candidacy in order to register for this class.1 - 9 hours.
Prerequisites: GAC Z

HPO-Health Policy and Org Courses

HPO 600. Management and Policy in Public Health Systems and Services. 3 Hours.
The course focuses on the policy and organizational levels related to public health and the overall improvement of population health. This course content examines models of public health policy and the political context of policy making; the organization, financing, and delivery of public health systems and programs; and planning, management, and leadership concepts needed to improve the public's health.

HPO 601. Health Economics. 3 Hours.
Economics is a systematic way of thinking about the use of resources. Health economics applies the tools of economics to issues of the organization, delivery and financing of health care. The objectives of this course are to: (1) develop a basic understanding of economic concepts and their relevance to the health care sector, (2) develop familiarity with the system of health care financing and delivery arrangements in the U.S., (3) develop a framework for analyzing health management and policy options using economic tools and perspectives.

HPO 602. MCH Evidence-Based Strategies Seminar. 1 Hour.
Building on the focus of the MPH core curriculum, this course will focus on using evidence-based and informed strategies in addressing maternal and child health issues in both domestic and global settings. Topics will include basic research principles, stages of research development, and practical issues of reviewing the literature and preparing and presenting at professional meetings. Students will use evidence to develop a policy memo around an MCH issue.

HPO 603. Public Health Policy. 3 Hours.
This course examines the role of government in health policy in the United States. The class is intended to provide students with a greater awareness of current health policy issues and the analytical skills necessary to evaluate policy options. We will begin the semester with a discussion of the rationales for health policy, followed by a discussion of the policy process and policy analysis. The second part of the semester will be devoted to U.S. health system reform- namely expanding insurance coverage and improving the value of health spending.

HPO 604. Health Economics and Public Health Policy. 3 Hours.
Economics is the study of choices in a world of scarcity. This course applies basic microeconomic principles to the study of the US health care system and public health policy. The first goal of the course is to provide students with an understanding of the core economic concepts (scarcity, economic welfare and market failures) which shape health care and public health policy. Next, students will be introduced to two competing theories of government – public interest theory and the economic theory of regulation – which will serve as a foundation for thinking about the role of government in health policy. Finally, the remainder the semester will provide students with a comprehensive overview of the US health care system including public and private health insurance, hospitals, physicians, the pharmaceutical industry and current issues in health care reform.

HPO 605. Foundations of Maternal and Child Health: Programs and Policies for Women, Children, and Families. 3 Hours.
The purpose of this course is to provide students with knowledge about current major Maternal and Child Health (MCH) issues (health, social, economic, and environmental) and programs and policies designed to address these issues among women of reproductive age, infants, and children. This course will focus primarily on public health problems and solutions of MCH populations in the United States. In addition to introductory information on specific health issues related to children and families, the evolution, status, and future performance of selected federal, state, and community programs will be analyzed. Course work also includes a review of factors that influence policy development and program implementation, including: 1) research, 2) data issues, 3) current public policy reform movements, and 4) advocacy.

HPO 606. Health and Development through the Life Course: Perspectives, Programs, and Policies. 3 Hours.
In developing, implementing, and evaluating effective maternal and child health programs and policies, it is critical to incorporate principles of development. Also critical is an understanding of how health trajectories of populations are influenced by broad social, economic, and environmental factors, a conceptual framework known as the life course perspective. This course covers 1) fundamental principles of human development; 2) how the central components of the life course perspective influence health and development; 3) how these stages of development are examined with research methodologies, using noted examples of databases and studies; and 4) how these concepts can be incorporated into MCH programs and policies.

HPO 607. Public Health Law. 3 Hours.
An introductory course in public health law designed for graduate students in public health. There are no prerequisites for this course. The purpose of the course is to introduce non-lawyers to the United States legal system and to the basic principles of law relevant to public health practitioners. It is intended to provide students with basic legal knowledge to assist them in communicating with attorneys about potential legal issues that may arise in formulating policy and exercising managerial authority. An overarching theme of the course is the tension between community interests and individual rights.

HPO 608. Reproductive Health. 3 Hours.
This course is intended to provide students with a foundation in reproductive health. It examines reproductive health issues, problems, policies, programs and services primarily in low-to-middle income countries.

HPO 609. Public Health Program Planning, Implementation and Evaluation. 3 Hours.
The purposes of this course is (1) to introduce the needs assessment and program planning, implementation, and evaluation processes specifically related to public health; and (2) to provide practical educational experiences to develop skills in applying rigorous methods and essential skills needed to conduct needs assessments and use the information gathered to plan, direct, and evaluate public health programs and impact public health policies. This course is required for all HPO students.

HPO 612. Strategic Management in Health Programs. 3 Hours.
The overall goal of the course is to provide a framework for strategic management and an opportunity to think strategically through a case study. In addition, the course provides an opportunity to integrate the knowledge and experience students have acquired in previous courses and health care organizational settings into a broad theory of management.

HPO 613. Health Information in Technology and Policy. 3 Hours.
The overall purpose of this course is to familiarize students with current issues associated with health information technology and their impact on the U.S. healthcare system.

HPO 615. Finance for Health Professionals. 3 Hours.
The goal of this class is to teach the principles necessary for effective financial management in healthcare to individuals who are not experienced financial executives. The focus of the class is on tools and techniques that assist managers in creating information to support managerial decision making. The course uses the case method of instruction, case analysis, and lectures.

HPO 617. Dynamics of Public Health Projects. 3 Hours.
The course provides awareness of and an introduction to the Dynamic processes of Public Health Projects. The course contains modules that define Project Dynamics and provide an overview of critical timelines and tasks. These modules include defining scope, establishing milestones, sequencing tasks, exploring efficiency, controlling resources, and monitoring progress.

HPO 618. Management Concepts in Public Health Programs. 3 Hours.
Management Concepts in Public Health Programs is an overview of management concepts applied to public health agencies and programs. In recognition of public and private managements' responsibility for organizational success the course approaches management by examining recurring themes in management thought. Selected readings are provided for each class session that apply the concepts examined to the health care, not-for-profit, and/or public sectors. Some of the articles relate to domestic (USA) organizations while others relate to management in the international context.

HPO 620. Health Insurance and Managed Care. 3 Hours.
This course provides an overview of health insurance, health insurance regulation, state healthcare reform efforts, and the Affordable Care Act. It begins with a history of the development of health insurance and its theoretical basis. It then turns to the problems of moral hazard and adverse selection. The role of managed care and employer sponsored health insurance are discussed. Regulation of private insurance and the Medicare and Medicaid programs are also reviewed. A significant part of the course will focus on the impact of the Affordable Care Act on private health insurance markets.

HPO 621. Clinical Decision Making and Cost-Effectiveness Analysis. 3 Hours.
Difficult choices must be made in areas such as patient care, clinical guideline development, and public health policy. These decisions often must be made in the face of great uncertainty. Decision analysis aims to formally evaluate those decisions and to make decisions from an informed perspective regarding expected outcomes. Cost-effectiveness analysis applies decision analysis to circumstances where both costs and outcomes are important criteria for making choices. This course will give students an understanding of the methods and uses of decision analysis and cost-effectiveness analysis, but should have basic familiarity with probability and statistics. The course will provide a thorough grounding in the fundamentals of decision analysis and cost-effectiveness analysis, and will introduce several intermediate-to-advanced topics. This course is open to Master's and Doctoral students from the School of Medicine, Nursing, and Health Professions as well as the School of Public Health.
Prerequisites: BST 611 [Min Grade: C](Can be taken Concurrently) and BST 612 [Min Grade: C](Can be taken Concurrently)

HPO 622. Design and Conduct of Cost-Effectiveness Research. 3 Hours.
The purpose of this course is to familiarize students with the design and implementation of cost-effectiveness and cost-benefit analysis.
Prerequisites: HPO 621 [Min Grade: C]

HPO 623. Pharmacoeconomics and Regulation. 3 Hours.
This course covers the principles of Pharmacoeconomics, defines the terminology used in pharmacoeconomic research, focuses on different types and measurement of pharmaceutical costs and outcomes, and investigates how they are analyzed in pharmacoeconomic techniques such as Cost-Benefit Analysis, Cost-Effective Analysis, Cost-Utility Analysis, Cost-Minimization Analysis, and Cost-Consequence Analysis. In addition, this course introduces the regulatory role of the FDA and some basic economic theories to understand the market of pharmaceutical products. Prerequisite BST 611 or Permission of Instructor.
Prerequisites: BST 611 [Min Grade: C]

HPO 625. Advanced Leadership and Practice in MCH Part I – Introduction to Leadership. 1 Hour.
The purpose of the course is to introduce students to leadership skills that are important for designing, advocating for, and leading community, state, and regional programs. The course is required for all MPH and DrPH students in the HPO/Maternal and Child Health Policy and Leadership track and is open to students from other tracks and departments. It is offered as three, one-hour courses that provide theory, skills, and practice with each subsequent course building upon previous courses. The courses will include lectures, group discussions, individual projects, and service-learning field-based activities.

HPO 626. Adv Leadership and Practice in MCH Module II – Collaborative Leadership and Advocacy. 1 Hour.
This is the second of a three-course sequence designed to equip students with the knowledge and skills needed to provide leadership in the development and delivery of needed programs and policies to promote the health and well-being of MCH populations.
Prerequisites: HPO 625 [Min Grade: C](Can be taken Concurrently)

HPO 627. ADV Leadership and Practice in MCH Module III – Into the Streets: Lead/Field Experience. 1 Hour.
The purpose of this course sequence is to provide students with the leadership skills necessary to work effectively at a community, state or regional level in the capacity of designing and advocating for programs and policies necessary to promote the health of women, children and families.
Prerequisites: HPO 625 [Min Grade: C] and HPO 626 [Min Grade: C]

HPO 628. Qualitative and Mixed Methods Research in Public Health. 3 Hours.
The purpose of this course is 1) to familiarize students with basic qualitative research methods used by public health researchers and practitioners, with a specific focus on their use in the health sciences; 2) to provide practical educational experiences to develop skills in the planning of qualitative studies and in the collection and analysis of qualitative data; and 3) to introduce students to the concept of mixed methods research and applications in public health. This course is designed to familiarize students who have little or no experience in conducting qualitative research with the perspectives, methods, and techniques of a vast tradition of research. The course will cover some of the methods of data collection used in the conduct of qualitative inquiries, the analysis of textual data, the write-up of findings from qualitative studies, and the development of a qualitative research proposals and reports.

HPO 630. Health and Development: Life Course Approach. 2 Hours.
In developing, implementing, and evaluating effective maternal and child health programs and policies, it is critical to incorporate principles of development. Also critical is an understanding of how health trajectories of populations are influenced by broad social, economic, and environmental factors, a conceptual framework known as the life course perspective. This course covers 1) fundamental principles of human development; 2) how the central components of the life course perspective influence health and development; 3) how these stages of development are examined with research methodologies, using noted examples of data bases and studies; and 4) how these concepts can be incorporated into MCH programs and policies.

HPO 631. Public Health Demography. 3 Hours.
Demography (the study of population) has become more important across a range of academic disciplines. There is a growing call on demographers outside academia, such as for policy-making, health care planning and analysis, or business administration. Demographic changes play a critical, though often poorly understood role in influencing the social, economic, and health fabric of our lives. This course introduces the core concepts and methods used in demographic analysis. It also provides a basic understanding of population dynamics and its health and socio-economic implications. Students will gain a firm foundation in how to measure fertility, mortality and migration; how to analyze population change and project population growth; and how to interpret demographic trends, their determinants and consequences.

HPO 632. Leadership in Maternal and Child Health. 3 Hours.
The health of women, children, youth, and families is influenced by many factors, including health practices, availability of public health and health care resources, and the social determinants of health. To promote health and positively affect these factors at the individual, community, and policy levels, specific knowledge, skills, personal characteristics, and values are needed. The purpose of the course is to engage students in the development of their own leadership skills and the application of these skills in the design, delivery, and evaluation of MCH programs and policies.

HPO 633. Policy and Women's Health. 3 Hours.
Across the lifespan, women face unique challenges related to their own health and wellbeing and are exposed to other historical and social influences that also affect their families and society. The purpose of this course is to examine women’s health from multidisciplinary and multidimensional perspectives, with specific focus on public health policies, programs, and prevention strategies that address women’s reproductive health and broader health and well-being within a life course framework that integrates biological determinants of health and the social, cultural, and economic contexts of women’s lives.

HPO 634. Health Care Innovation. 3 Hours.
This course focuses on sustainable and socially responsible health care innovations. Students will be introduced to the realities of problem identification and will provide a how-to framework and case studies of healthcare ventures.

HPO 635. Policy and Child and Adolescent Health. 3 Hours.
Children and adolescents, including children and youth with special health care needs, interact with and are touched by multiple public and private systems as they progress through their early lifespans. These include health care, educational settings, social programs, childcare, and public health. They are also part of family/caregiver units and are influenced by that environment and the experiences of those family members and caregivers. The safety, security, health, resiliency, and life trajectories for children and adolescents are impacted in multiple ways – positive, negative, and somewhere in-between – through their own experiences, as well as those of their families/caregivers and the environments around them. It is for this reason that many approaches to health and wellness for this population are two-generational, meaning that they are focused on the child and family, or are directed towards the other adults who care for them in external systems such as schools, childcare settings, and health provider offices. Given this uniqueness, policy and program influences are often realized through the lens of caregivers and factors that influence them (social determinants of health and well-being, life course experiences).

HPO 636. Public Health and Healthcare Delivery Systems. 1 Hour.
The public health system is comprised of federal, state, and local organizations and agencies. These organizations work with other entities, public and private, such as health care systems, non-profits, and pharmaceutical companies to address and combat public health issues. In this course, students will examine the functions of governmental public health, systems collaboration between public health and health care delivery, and the role of government in public health. Students will apply previous knowledge of systems thinking to examine the contributions and challenges of the public health and health care delivery related to past and current public health events. By the end of this course, students will gain skills in distinguishing organizations and components of public health and health care delivery systems.

HPO 637. Design and Management of Complex Public Health Systems. 1 Hour.
Designing solutions or responses to complex public health issues require management and leadership skills to navigate within and across multiple sectors. The purpose of this course is to equip students with management and leadership techniques to engage appropriate partners in the design of a solution to a public health issue. Building on work in HPO 636, students will engage in case studies that provide insight into how public health leaders historically approached complex, multi-factorial issues that required a collaborative and coordinated response across multiple sectors. The culminating project will be developing a plan to address a public health issue that incorporates multiple agencies. Students also will identify associated leadership and management skills needed for this response.

HPO 638. Current Issues in Public Health Policy. 1 Hour.
With global public health events such as the Ebola outbreak and more recent COVID-19 pandemic, public health students' benefit from understanding how social and health policy influence health; physical, mental, and social well-being. As the political landscape changes, domestically and globally, public health students should critically analyze the effect of policy on determinants that impact health outcomes among populations. Policy decisions, both locally and nationally, can shape public health practice and organization dynamics, progress the achievement of health equity, increase or decrease health disparities, and more. This course will allow students to consider current public health issues and evaluate how policies or the lack thereof influence population health. This course is an in-depth opportunity for students to explore controversial public health topics and assess the effectiveness of policy implementation. By the end of this course, students will have developed the skills of analyzing and evaluating public health policy. Prerequisite: HPO 604 (Health Economics & Health Policy) is recommended.

HPO 640. Disaster and Emergency Management. 3 Hours.
The course will provide a concerted look into the realm of disaster and emergency management. Discussions in this course will concentrate on how disaster and emergency management has changed since 9/11 including new legislation and governmental structures. The course will culminate with a look at the roles and responsibilities of the public health system in preparing for and responding to both natural and man-initiated disasters. This course is intended for advanced MPH or doctoral students with an interest in preparedness policy, emergency management, or public health preparedness.

HPO 641. Public Health Preparedness and Response. 3 Hours.
Public health professionals must be prepared to respond to a range of emergencies before they strike. The purpose of this course is to prepare students by introducing sentinel public health preparedness policies, systems, frameworks and tools that guide emergency planning, response, and recovery operations and evaluation. This course will provide students with an overview of public health emergency preparedness and response (PHEPR) and hospital preparedness program (HPP) as well as other key public health preparedness funding initiatives. During this course we will explore policy and policy making in the U.S., learn how the political context can influence policy priorities, discuss sentinel public health preparedness policies and public health preparedness programs, and a framework for approaching emergency planning and evaluation.

HPO 642. Preparedness and Agriculture. 3 Hours.
This course presents the potential effects of an animal disease outbreak, whether natural, accidental or deliberate, on the affected communities. Topics covering the prevention and diagnosis of and the response to an animal disease outbreak will be presented. Examples of the interaction of public health with other disciplines will be provided. This course is designed for MPH students with an interest in preparedness policy, emergency management, or public health preparedness.

HPO 643. Emergency Preparedness Exercises, Evaluation and Communication. 3 Hours.
This course will provide participants with an understanding of the psychological processes that occur during crises, how those processes impact human functioning, and how communication plays a critical role in the psychological outcomes of crisis situations.

HPO 645. Comparative Health Systems and Policy. 3 Hours.
This course provides a comprehensive survey of a number of healthcare systems from low-, middle-, and high-income countries, situating the U.S. and other national experiences in a comparative cross-national frame. The course provides frameworks for students to analyze in diverse settings the different ways that health policy is developed and implemented, given the resources, capacities, and systems of each country. The course will also examine the ways in which health care is organized and delivered, along with underlying global public health principles and impacts. By comparing health systems and policies, globally, students will reflect on how a country's social-historical context and values, geography, polity and economy influence the way that health care is provided and its relationship with population health, as well as how health policies influence the quality of life.

HPO 670. Social and Ethical Issues in Public Health. 3 Hours.
This class examines ethical issues related to public health research and practice, and explores the social issues that complicate ethical decision-making. There are no pre-requisites. This class is open to all students with graduate standing.

HPO 672. Perinatal Health: Issues, Data, and Policies. 3 Hours.
The purpose of this course is to provide students with knowledge related to perinatal health issues and polices. In addition, the course will allow students to gain basic skills in analysis of population-based data sets using SAS. This course at the 600 and 700 level is an elective for students seeking the Master of Public Health (MPH) degree and the Doctor of Public Health (DrPH). Other students interested in this area are encouraged to register. An introductory SAS course is recommended but not required.

HPO 677. Patient-Based Outcomes Measurement. 3 Hours.
This course will provide an in-depth overview of the concepts, methods, and instruments used to evaluate health from the perspective of the individual. The overall objective of this course is to provide a detailed examination of patient-based/centered outcomes measurement in the context of health care delivery systems and health care policy.
Prerequisites: BST 611 [Min Grade: C](Can be taken Concurrently)

HPO 687. Empirical Methods for Health Research. 3 Hours.
The course aims to provide a thorough treatment of simple and multivariate regression models, simple binary dependent variable models, simple panel data models, and instrumental variables methods. Particular emphasis is placed on methods used to address omitted variable bias, such as difference-in-difference. The course is structured to provide students with ample opportunity to acquire hands-on experience in working with data by performing empirical analysis using the statistical software STATA.
Prerequisites: BST 611 [Min Grade: C](Can be taken Concurrently)

HPO 689. HPO Integrative Learning Experience. 2 Hours.
The HPO ILE or capstone course represents a culminating experience that allows students to demonstrate synthesis of MPH foundational and concentration competencies. The HPO ILE, using a case-based educational methodology, will allow students to work in teams to create a comprehensive strategic plan for a public health program while developing a program plans and evaluation plans to address a specific health issues. Students will also address the policy implications associated with the health issue through a policy analysis. Students in the HPO-MCH concentration will focus specifically on an MCH-relevant issue in the ILE. MPH students should complete the ILE in the final term of the MPH program, after all core courses and the MPH internship experience are completed.
Prerequisites: PUH 688 [Min Grade: C]

HPO 691. Policy Analysis: Modeling and Simulation. 3 Hours.
This course shows how models are built and used for public policy making and clinical decision analysis. The goal is for you to develop basic skills with building various types of models. Models include the optimization method of linear programming, spreadsheets with various types of randomness, bootstrapping data to estimate how much a model's results may vary, discrete event modeling, queuing, Markov models, and an introduction to some advanced models using Netlogo and Python programming.
Prerequisites: BST 611 [Min Grade: C] and BST 612 [Min Grade: C]

HPO 692. Health Equity and Inclusion in Public Health Programs and Policies. 3 Hours.
The aim of this course is to engage students in critical thinking about the current paradigms for health disparities and equity research and public health practice and policies. As a part of this process, students will be challenged to think about the social, political, and economic determinants of health disparities for diverse health care consumers, to identify substantive trends and gaps in the health disparities literature, and to develop an innovative research or policy oriented strategy for reducing health disparities. We will discuss health and health care disparities according to race/ethnicity, sex, orientation, health status, and geographic location.

HPO 695. Seminar in Health Policy and Organization. 1-3 Hour.
Factors currently influencing finance and administration of public and private health programs; availability, accessibility, and utilization by selected population groups.

HPO 698. Master's Level Directed Research Health Policy and Organization. 1-9 Hour.
Independent study with guidance of appropriate faculty.

HPO 699. Master's Level Project Research Health Policy and Organization. 1-9 Hour.
Research for project under direction of appropriate faculty and/or research project committee.

HPO 701. Health Economics. 3 Hours.
Economics is a systematic way of thinking about the use of resources. Health economics applies the tools of economics to issues of the organization, delivery and financing of health care. The objectives of this course are to: (1) develop a basic understanding of economic concepts and their relevance to the health care sector, (2) develop familiarity with the system of health care financing and delivery arrangements in the U.S., (3) develop a framework for analyzing health management and policy options using economic tools and perspectives.

HPO 703. Public Health Policy - Doctoral Level. 3 Hours.
This course examines the role of government in health policy in the United States. The class is intended to provide students with a greater awareness of current health policy issues and the analytical skills necessary to evaluate policy options. We will begin the semester with a discussion of the rationales for health policy, followed by a discussion of the policy process and policy analysis. The second part of the semester will be devoted to U.S. health system reform- namely expanding insurance coverage and improving the value of health spending.

HPO 704. Health Economics and Public Health Policy. 3 Hours.
Economics is the study of choices in a world of scarcity. This course applies basic microeconomic principles to the study of the US health care system and public health policy. The first goal of the course is to provide students with an understanding of the core economic concepts (scarcity, economic welfare and market failures) which shape health care and public health policy. Next, students will be introduced to two competing theories of government – public interest theory and the economic theory of regulation – which will serve as a foundation for thinking about the role of government in health policy. Finally, the remainder the semester will provide students with a comprehensive overview of the US health care system including public and private health insurance, hospitals, physicians, the pharmaceutical industry and current issues in health care reform. Ideally, students will come away from the course with a better understanding of the role of economics in the US health care system, and an improved ability to analyze the motivations and consequences of government intervention in markets.

HPO 706. Strategic Management Theory/Research. 3 Hours.
The vision for the course is to develop highly competitive strategic management major graduates at that doctoral level. Strategic Management Theory and Research is to provide a forum for the introduction of the concepts and issues of strategic management in order to facilitate their understanding and communications.

HPO 708. Reproductive Health. 3 Hours.
This course is intended to provide students with a foundation in reproductive health. It examines reproductive health issues, problems, policies, programs and services, primarily in low-to-middle income countries.

HPO 714. Life Course Seminar. 3 Hours.
The purpose of this course is to expand knowledge and research skills around MCH life course issues. As guided by faculty, students will review and critique the literature in given areas around life course science and specific life span issues. Students will work with the library liaison to conduct extensive literature reviews and move toward writing a manuscript for submission to a peer-reviewed journal. It will serve as a foundation for skills needed in other courses as well as foundational knowledge related to maternal and child health science. The course is required for all HPO-MCH doctoral students. Other doctoral or higher level Masters' students interested in a research path may register with the approval of the instructor. Prerequisites: Ideally, students will have taken all course work prior to taking this course. However, the DrPH director and course instructors may make exceptions.

HPO 715. Finance for Health Professionals. 3 Hours.
Financial management of public health care organizations. Emphasis on time value on money, capital raising methods, cost of capital, capital budgeting methods and working capital policy. Problem-solving orientation with applications to public health issues.

HPO 716. Advanced Leadership and Practice Seminar. 3 Hours.
This seminar provides a foundation for all doctoral students in the concepts and application of leadership and management in public health practice. Part I of the course will explore and discuss the nature and processes of doctoral education and academic teaching, scholarship, service, and other duties related to a traditional academic research or scholarly practice setting. Part II of the course allows doctoral students to enhance their leadership skills, through personal development activities as well as through interaction with public health leaders. In Part 111, students will gain a deeper understanding of how research is applied in public health practice through the completion an interdisciplinary project that draws upon management and organizational skills. The course will be co-led by faculty members with across the department. Prerequisites: Ideally, students will have taken all course work prior to taking this course. However, the DrPH director and course instructors may make exceptions.

HPO 717. Seminar in Public Health Policy. 3 Hours.
The purpose of this course is to enhance doctoral students' understanding of public health policy, including the policy making process and the role of various components of the public health system in the design and implementation of policy. The course will focus on the linkages between public health research and practice. The course will engage students in the discussion of contemporary public health issues and will focus heavily on the critical task of assessing these issues from multiple stakeholder and ideological perspectives. The course will also focus heavily on writing and the tools necessary for policy development, advocacy and implementation.

HPO 718. Management Concepts in Public Health Programs. 3 Hours.
Management Concepts in Public Health Programs is an overview of management concepts applied to public health agencies and programs. In recognition of public and private managements' responsibility for organizational success the course approaches management by examining recurring themes in management thought. Selected readings are provided for each class session that apply the concepts examined to the health care, not-for-profit, and/or public sectors.

HPO 720. Health Insurance and Managed Care. 3 Hours.
This course provides an overview of health insurance, health insurance regulation, state healthcare reform efforts, and the Affordable Care Act. It begins with a history of the development of health insurance and its theoretical basis. It then turns to the problems of moral hazard and adverse selection. The role of managed care and employer sponsored health insurance are discussed. Regulation of private insurance and the Medicare and Medicaid programs are also reviewed. A significant part of the course will focus on the impact of the Affordable Care Act on private health insurance markets.

HPO 721. Clinical Decision Making and Cost Effectiveness Analysis. 3 Hours.
Difficult choices must be made in areas such as patient care, clinical guideline development, and public health policy. These decisions often must be made in the face of great uncertainty. Decision analysis aims to formally evaluate those decisions and to make decisions from an informed perspective regarding expected outcomes. Cost-effectiveness analysis applies decision analysis to circumstances where both costs and outcomes are important criteria for making choices. This course will give students an understanding of the methods and uses of decision analysis and cost-effectiveness analysis, but should have basic familiarity with probability and statistics. The course will provide a thorough grounding in the fundamentals of decision analysis and cost-effectiveness analysis, and will introduce several intermediate-to-advanced topics. This course is open to Master's and Doctoral students from the School of Medicine, Nursing, and Health Professions as well as the School of Public Health.
Prerequisites: BST 611 [Min Grade: C] and BST 612 [Min Grade: C]

HPO 722. Design and Conduct of Cost-Effectiveness Research. 3 Hours.
The objective of this course is to familiarize students with the design and implementation of cost-effectiveness and cost-benefit analysis.
Prerequisites: HPO 721 [Min Grade: C]

HPO 723. Management of Complex Health Organizations. 3 Hours.
Complexity as related to management of health organizations. Academic health centers as models of complex organization. Incentive systems, organizational politics, and ownership and control within context of high complex health organizations.

HPO 728. Qualitative and Mixed Methods Research in Public Health. 3 Hours.
The purpose of this course is 1) to familiarize students with basic qualitative research methods used by public health researchers and practitioners, with a specific focus on their use in the health sciences; 2) to provide practical educational experiences to develop skills in the planning of qualitative studies and in the collection and analysis of qualitative data; and 3) to introduce students to the concept of mixed methods research and applications in public health. This course is designed to familiarize students who have little or no experience in conducting qualitative research with the perspectives, methods, and techniques of a vast tradition of research. The course will cover some of the methods of data collection used in the conduct of qualitative inquiries, the analysis of textual data, the write-up of findings from qualitative studies, and the development of a qualitative research proposals and reports.

HPO 730. Health and Development: Life Course Approach. 2 Hours.
In developing, implementing, and evaluating effective maternal and child health programs and policies, it is critical to incorporate principles of development. Also critical is an understanding of how health trajectories of populations are influenced by broad social, economic, and environmental factors, a conceptual framework known as the life course perspective. This course covers 1) fundamental principles of human development; 2) how the central components of the life course perspective influence health and development; 3) how these stages of development are examined with research methodologies, using noted examples of data bases and studies; and 4) how these concepts can be incorporated into MCH programs and policies.

HPO 740. Disaster and Emergency Management. 3 Hours.
The course will provide a concerted look into the realm of disaster and emergency management. Discussions in this course will concentrate on how disaster and emergency management has changed since 9/11 including new legislation and governmental structures. The course will culminate with a look at the roles and responsibilities of the public health system in preparing for and responding to both natural and man-initiated disasters. This course is intended for advanced MPH or doctoral students with an interest in preparedness policy, emergency management, or public health preparedness.

HPO 741. Public Health Preparedness and Response. 3 Hours.
Public health professionals must be prepared to respond to a range of emergencies before they strike. The purpose of this course is to prepare students by introducing sentinel public health preparedness policies, systems, frameworks and tools that guide emergency planning, response, and recovery operations and evaluation. This course will provide students with an overview of public health emergency preparedness and response (PHEPR) and hospital preparedness program (HPP) as well as other key public health preparedness funding initiatives. During this course we will explore policy and policy making in the U.S., learn how the political context can influence policy priorities, discuss sentinel public health preparedness policies and public health preparedness programs, and a framework for approaching emergency planning and evaluation.

HPO 742. Preparedness and Agriculture. 3 Hours.
This course presents the potential effects of an animal disease outbreak, whether natural, accidental or deliberate, on the affected communities. Topics covering the prevention and diagnosis of and the response to an animal disease outbreak will be presented. Examples of the interaction of public health with other disciplines will be provided. This course is designed for MPH students with an interest in preparedness policy, emergency management, or public health preparedness.

HPO 743. Emergency Preparedness Exercise, Evaluation & Communication. 3 Hours.
This course will provide participants with an understanding of the psychological processes that occur during crises, how those processes impact human functioning, and how communication plays a critical role in the psychological outcomes of crisis situations.

HPO 744. Crisis and Risk Communication. 3 Hours.
This course is about anticipating and identifying problems and issues and managing communication during times of public health crisis and uncertainty. It will provide an opportunity for students to establish or advance their understanding of communication methods. Most importantly, it will teach students to master the "art" of communication effectively with a variety of audiences and through the strategic use of various communication tools, particularly when stakes are high and impact public health. This course will examine current and past public health events and provide an opportunity to discuss and analyze the communication strategies used in these scenarios.

HPO 746. Public Health Preparedness Research Methods. 3 Hours.
This course will provide an opportunity for students to establish or advance their understanding of research through critical exploration of research language, ethics, and approaches. Students will learn concepts and skills required for research design, implementation, data analysis, statistical testing, and results reporting. Students will learn how to identify problems to study, develop hypotheses and research questions, specify independent and dependent variables, check for the validity and reliability of studies and design research projects. Successful public health professionals should be able to demonstrate knowledge and skills in these areas to conduct original research and critically review published research. Students will ultimately select a study design that is best suited to address their problem of interest.

HPO 772. Perinatal Health: Issues, Data, and Policies. 3 Hours.
The purpose of this course is to provide students with knowledge related to perinatal health issues and polices. In addition, the course will allow students to gain basic skills in analysis of population-based data sets using SAS. This course at the 600 and 700 level is an elective for students seeking the Master of Public Health (MPH) degree and the Doctor of Public Health (DrPH). Other students interested in this area are encouraged to register. An introductory SAS course is recommended but not required.

HPO 777. Patient-Based Outcomes Measurement. 3 Hours.
This course will provide an in-depth overview of the concepts, methods, and instruments used to evaluate health from the perspective of the individual. The overall objective of this course is to provide a detailed examination of patient-based/centered outcomes measurement in the context of health care delivery systems and health care policy.

HPO 781. Research Methods and Study Design. 3 Hours.
This course examines empirical methods utilized in health economics, policy and management research. The course supplements the material covered in HPO 787, with a focus on the application of econometric methods to contemporary topics in health research. The course begins with an overview of experimental and non-experimental research and the critical distinction between associative and causal relationships. The remainder of the course will focus on the difficulty of identifying causal relationships in non-experimental contexts, and the methods that are commonly used to overcome these challenges. At the end of the semester, students should come away with an improved grasp of the interdisciplinary language of health research and a deeper appreciation of the importance of research design in quantitative work.

HPO 787. Empirical Methods for Health Research. 3 Hours.
The objectives of the course are to provide thorough treatment of simple and multivariate regression models, simple binary dependent variable models, instrumental variables estimators, sample selection and two-part models, and simple panel data models. Course provides students with an opportunity to acquire hands-on software. This course is designed for students who have had limited experience with regression analysis but a working knowledge of simple statistics, probability distributions, and basic calculus. Students must have upper level undergraduate or graduate coursework in statistics and probability; basic calculus. Prerequisites: Senior Undergraduate or Graduate Course in Statistics & Probability Distributions.

HPO 791. Policy Analysis: Modeling & Simulation. 3 Hours.
This course shows how models are built and used for public policy making and clinical decision analysis. The goal is for you to develop basic skills with building various types of models. Models include the optimization method of linear programming, spreadsheets with various types of randomness, bootstrapping data to estimate how much a model's results may vary, discrete event modeling, queuing, Markov models, and an introduction to some advanced models using Netlogo and Python programming.
Prerequisites: BST 611 [Min Grade: C] and BST 612 [Min Grade: C]

HPO 792. Health Equity and Inclusion in Public Health Programs and Policies. 3 Hours.
The aim of this course is to engage students in critical thinking about the current paradigms for health disparities and equity research and public health practice and policies. As a part of this process, students will be challenged to think about the social, political, and economic determinants of health disparities for diverse health care consumers, to identify substantive trends and gaps in the health disparities literature, and to develop an innovative research or policy oriented strategy for reducing health disparities. We will discuss health and health care disparities according to race/ethnicity, sex, orientation, health status, and geographic location.

HPO 793. DrPH Practicum. 3-6 Hours.
All DrPH students will complete an applied practice experience (Practicum) in which the student will complete at least one project that is meaningful for a public health organization and to advanced public health practice. In addition to self-reflection on the applied practice experience, the student will produce a final product that addresses the competencies listed below. This may take the form of a written report, portfolio, or other deliverable as determined by the student, advisor, and/or Practicum preceptor, according to departmental guidelines.

HPO 795. Directed Readings. 1-6 Hour.
The purpose of this course is to assist students in preparing literature reviews, manuscripts, or to complete other activities as deemed appropriate by the faculty member. Final objectives will be based upon the work between the student and advisor.

HPO 796. Doctoral Seminar in Health Policy and Organization. 1 Hour.
Doctoral students will be introduced to advanced topics in public health policy and practice, health services research methods and management research. In addition, topics directly related to doctoral studies (article critiques, literature reviews, manuscript preparation, dissertation protocol development, etc.) will be discussed.

HPO 797. Directed Readings for DrPH Comprehensive Examination. 3 Hours.
The Directed Readings for DrPH Comprehensive Examination in HPO is required for HPO DrPH students as part of their training. The primary aim of this course is to assist students in preparing for their comprehensive exams. Doctoral students may register for this course in the term in which they prepare for and take their comprehensive examination.

HPO 798. Doctoral Level Directed Research Health Policy and Organization. 3-9 Hours.
The purpose of this course is for students to develop dissertation research protocols that will be presented to their dissertation committee for final approval. Final objectives will be based upon the work between the student and advisor.

HPO 799. Dissertation Research HPO. 3-9 Hours.
Research for dissertation under direction of dissertation committee. Must be advanced to candidacy.
Prerequisites: GAC Z

PUH-Public Health Courses

PUH 600. Overview of Public Health. 0-3 Hours.
The Overview of Public Health (OPH) course is intended to provide professional degree students in the School of Public Health (SOPH) a broad overview of the core areas of public health. This course was designed to address the foundational public health learning objectives. This course will introduce students to and facilitate their understanding of how public health relates to their discipline. As well as, how all disciplines relate to achieve the goals of public health.

PUH 601. This is Public Health. 1 Hour.
Understand the history, philosophy, and values of public health, including the structure and functions of organizing governmental public health.

PUH 602. Community Assessment. 3 Hours.
Becoming aware of current conditions through a community assessment is the first step to evidence-based public health. This course will introduce students to the various community assessments methods used to identify and prioritize community needs, concerns, and preferences, as well as to identify community assets, and inform the development of public health interventions. Students will be able to utilize a breadth of data sources commonly used to assess population health needs, assets and capacities that affect community health. Topics to be covered include the introduction to planning models, stakeholder identification, coalition building, quantitative data sources, quantitative and qualitative data collection methods, analysis of qualitative data, interpreting data, and framing community issues.
Prerequisites: PUH 601 [Min Grade: C](Can be taken Concurrently)

PUH 603. Quantitative Methods in Public Health. 3 Hours.
To appropriately address the needs of communities, we must be able to prioritize their leading health concerns. Quantitative methods allow us to examine the associations between various social, ecological, biological, and environmental factors and health outcomes, to identify populations at elevated risk for poor health outcomes, and to assess the effect of programs or policies implanted to improve health outcomes. This course introduces students to the broad range of epidemiologic and biostatistical methods used in public health, with particular attention to how quantitative results can be communicated clearly to scientific and non-scientific audiences.
Prerequisites: PUH 601 [Min Grade: C](Can be taken Concurrently)

PUH 604. Programs and Policies. 3 Hours.
This course covers how to collect and apply evidence of community needs in order to identify and prioritize programs and policies for implementation. Public health programs and policies should improve the quality of life of persons and communities through the reduction or elimination in the incidence, prevalence, and rates of disease and disability as well as the promotion of human flourishing via the preservation and improvement of community health. In doing so, programs and policies should strive to improve conditions and access to resources for healthy living for all persons. Given the breadth and complexity of factors that influence health, public health has developed a rich toolkit to guide our efforts to improve community health. This course reviews key elements of that toolkit, including (1) methods and theoretical tools used to collaboratively and inclusively determine community priorities for promoting health; (2) planning models and theories used to guide the development of public health programs and influence health policy; and (3) strategies to frame public health issues with the ultimate goal of informing and successfully advocating for public health policies. From prioritizing goals and objectives to planning for successful implementation, this course explores the multiple dimensions of the successful adoption of public health policies and programs.
Prerequisites: PUH 601 [Min Grade: C] and PUH 602 [Min Grade: C] and PUH 603 [Min Grade: C]

PUH 605. Public Health Management and Evaluation. 3 Hours.
Applying effective management methods and principles and evaluating the impact of programs and policies to determine community cost and impact are essential components of evidence-based public health. This course includes an exploration of key management, governance, and leadership principles necessary for the successful implementation and evaluation of public health programs and policies. Managers and organizations often operate with limited resources, thus learning how to be good stewards of financial and human resources is essential. This requires the ability to develop budgets and evaluation plans, operate within and foster interprofessional collaboration, manage conflict, and ethical decision-making. A cornerstone of good management is the continuous and rigorous determination of the consequences of one's choices and actions; did the program or policy have the desired effect? Did it have unintended consequences? This course introduces students to methods of process, formative, summative, and outcome evaluation, including experimental designs and participatory models of evaluation.
Prerequisites: PUH 601 [Min Grade: C] and PUH 602 [Min Grade: C] and PUH 603 [Min Grade: C]

PUH 606. Leadership for Evidence-Based Public Health. 1 Hour.
Developing competencies to provide effective leadership for evidence-based public health. Effective leadership for evidence-based public health requires competencies in advocacy, negotiation, communication, and collaboration, all within a "systems thinking" framework. This course includes an exploration of theoretical constructs and concepts in leadership, balanced with a series of case studies, presentations, and interviews with leaders that provide examples of the application of these leadership competencies in public health practice. Students will learn to advocate for programs and policies, apply negotiation skills, communicate using appropriate strategies for specific audiences, collaborate through interprofessional learning experiences, and apply systems thinking to a public health issue. Students will be assessed through papers, group projects, and participation.
Prerequisites: PUH 601 [Min Grade: C] and PUH 602 [Min Grade: C] and PUH 603 [Min Grade: C] and PUH 604 [Min Grade: C](Can be taken Concurrently) and PUH 605 [Min Grade: C](Can be taken Concurrently)

PUH 610. Population Health. 3 Hours.
This course introduces you to the field of population health. It is intended for students and those receiving training or already working in different aspects of health and social care who wish to improve their understanding of this interdisciplinary field. Population health is a relatively new term with many meanings, but at its core, it has three central concerns. These include assessing the range of health outcomes of population groups; understanding the multiple determinants of the levels and distributions of heath within and across populations; and addressing those factors through policies and practices to improve health and ameliorate health disparities.

PUH 627. Writing & Reviewing Research for MPH Candidates. 3 Hours.
PUH 627 is a course that meets for ten three-hour sessions over the course of 10 weeks. Class time will be filled with discussion, group activities, tasks, writing, peer review, and presentations. By the end of this 10-week course, PUH 627 student writers will demonstrate a working grasp of academic research writing best practices, including ethics for authors, and gain knowledge and confidence as writers after completing weekly non-graded reading/writing activities, 3 rigorous graded writing assignments, and a final (a research proposal presentation) as measured by: 1) an average of grades on writing rubrics and 2) instructor evaluation.

PUH 685. Training in Public Health Teaching. 3 Hours.
Acquire skills for teaching in higher education, including syllabus design, communication skills for the classroom and office hours, creating assignments and rubrics, preparing and giving lectures, preparing nondidactic content, and effective grading. Prerequisites: Must have completed the course that you will be the TA, or similar course, in a prior semester with a grade of B or higher. Have an overall GPA of 3.0 or higher (be a student in good standing with the UAB Graduate School). Receive an invitation from the applicable faculty member to register for this course.

PUH 688. Public Health Internship. 3 Hours.
All students in the MPH degree program are required to complete the three (3) credit hour public health internship (PUH 688) as a part of their curriculum. The internship provides an opportunity for each student to work in a public health setting with responsibilities similar to those in an entry-level MPH position. The internship cumulates with the submission of at least two work products developed by the student that benefit the agency/organization and allows the student to successfully demonstrate competency attainment in five (5) of the Foundational MPH competencies. Students should have completed the core classes before registering for an internship.
Prerequisites: PUH 601 [Min Grade: C] and PUH 602 [Min Grade: C] and PUH 603 [Min Grade: C] and PUH 604 [Min Grade: C] and PUH 605 [Min Grade: C] and PUH 606 [Min Grade: C]

PUH 690. Special Topics in Public Health. 1-6 Hour.
This is a general course that may be used for special topic lectures or directed readings.

PUH 696. Exploring Population Health. 6 Hours.
Public health is what we do together as a society to ensure the conditions in which everyone can be healthy. This course will provide students an opportunity to learn about both historical and contemporary public health issues, their effects on population health, and how public health systems are working to solve the health issues affecting our communities today. This course will focus on the Southeast United States. Students will tour historically significant sites, visit communities and community-based organizations, attend featured presentations around both contemporary and historical public health issues, as well as visit local, state, tribal and federal public health agencies to learn about their structure, programs, service delivery models, and approaches to addressing issues of public health. The sum of this experience will illustrate the interdisciplinary nature of public health practice and the need to add attention to the social determinants of health – the conditions in the social, physical, and economic environment in which people are born, live, work and age – in order to achieve health equity. Travel is required for this course.

PUH 703. Public Health Grant Writing. 3 Hours.
This course will explore approaches to writing research grants including the preparation of grant proposals and the peer review process for research grants. We will address the development of testable research hypotheses, preparing an aims page, drafting the significance, innovation and approach sections of a grant, and preparing an NIH-formatted biosketch. Additionally, we will discuss assembling a team for conducting the work proposed in a grant, statistical power and sample size considerations and the peer-review process for research grants. The majority of class sessions will be led by guest lecturers who have substantial experience writing grants. Prerequisites: Students must have completed the first year of their doctoral program and obtain permission from their academic advisor.

Certificate Programs

The UAB School of Public Health has three certificate programs:

Certificate in Applied Biostatistics and Epidemiology

Chair: Jeff Szychowski, Ph.D.
Vice Chair of Education: Stacey Cofield, PhD
Contact Person: Nicole Cross, MA
Contact E-mail: nicolen@uab.edu
Phone: (205) 934-4358
Website: www.uab.edu/soph/home/graduate/programs/biostatistics-and-epidemiology-certificate

The Certificate in Applied Biostatistics and Epidemiology aims to provide applied knowledge and skills in common statistical analysis and introductory concepts of epidemiological methods. With both existing and continually emerging public health issues, there is a great demand for professionals with the skills to analyze and interpret real-world public health and healthcare-related data to solve problems in these fields and to research and analyze real-world public health and healthcare-related problems.

Program Format

The 5-course certificate will teach methods in applied biostatistics, including linear and categorical methods, research design, and an introduction to epidemiological methods. The certificate can be completed online or a blend of online and face-to-face courses. Students must

maintain a 3.0 GPA to remain in good academic standing and to earn the certificate.

Admission Requirements

Graduate students may enroll in the Applied Biostatistics and Epidemiology Certificate Program at any time during their graduate course of study at UAB. Any student who wishes to enroll into the Applied Biostatistics and Epidemiology Certificate Program is responsible for meeting with his or her departmental coordinator and with the Department of Biostatistics Student Coordinator to ensure that all administrative requirements have been met.

Applicants not currently enrolled at UAB should apply by completing an application through the UAB Graduate School. Currently enrolled UAB graduate students should apply by submitted the following documents to Nicole Cross (nicolen@uab.edu).

Application Requirements

- Transcripts from ALL higher education institutions you attended and received college credit (unofficial are fine)
- A bachelor's degree with an undergraduate GPA of 3.0 or higher
- Resume/Curriculum Vitae
- Personal statement

Requirements		Hours
Departmental Requirements		**9**
BST 611	Intermediate Statistical Analysis I	
BST 612	Intermediate Statistical Analysis II	
EPI 610	Principles of Epidemiologic Research	
Elective Biostatistics - choose 1		**3**
BST 613	Intermediate Statistical Analysis III	
BST 625	Design/Conduct Clinical Trials	
BST 626	Data Management and Reporting with SAS	
Elective Epidemiology - choose 1		**3**
EPI 602	Epidemiology of Chronic Diseases	
EPI 603	Injury-Epidemiologic Principles and Prevention Strategies	
EPI 605	Epidemiology of Infectious Diseases	
EPI 621	HIV/AIDS and STDs	
Any other EPI Course (if prerequisites are met)		
Total Hours		**15**

Public Health Graduate Certificate

Contact Person: Meghan Walker
Contact E-mail: mewalker@uab.edu
Phone: (205) 934-2684
Website: **www.uab.edu/soph**

The Public Health Certificate is a 17-hour course of study ideal for individuals interested in exploring the field of public health or expanding their knowledge and skills. The certificate is built around the MPH Core, which is based on the Evidence-Based Public Health framework. This core set of courses builds skills in all critical areas of public health, including public health and health care systems; planning and promotion to promote health; as well as policy, leadership, communication, and systems thinking. Students also select one elective course from all available master's-level courses to round out their training.

The Public Health Certificate is available completely online and does not require any travel to Birmingham (though students are welcome to take on-campus courses if they prefer). Coursework taken in pursuit of the Public Health Certificate can be used toward an MPH degree for students who choose to continue their training at the UAB School of Public Health.

Program Format

Students are required to take the 6 public health core courses from the Master of Public Health program (14 credit hours) and a 3 credit hour elective, for a total of 17 credit hours. Students must maintain a 3.0 GPA to remain in good academic standing and to earn the certificate. Certificate students may apply for the MPH or other degree programs within the UAB School of Public Health and if admitted, the courses taken will be counted towards the completion of the degree program; the courses must have been completed in the last five years with a minimum grade of B. If you have questions about the program prior to enrolling, please reach out to Meghan Walker at mewalker@uab.edu.

Admission Requirements

Applicants not currently enrolled at UAB should apply by completing an application through the UAB Graduate School: www.uab.edu/graduate/admissions.

Application Requirements

- A Bachelor's degree from a regionally accredited institution
- GPA of 3.0 or higher
- Statement of Purpose

Requirements		Hours
Public Health Courses		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
Approved Elective Course		**3**
Total Credit Hours:		**17**

Global Health Studies Graduate Certificate

Director: Meredith Gartin, PhD
Contact Person: Misty Altiparmak, MEd
Contact E-mail: maltima@uab.edu
Phone: (205) 996-0076
Website: www.uab.edu/soph/home/graduate/programs/global-health-studies-certificate

This 15-hour certificate program is offered to any UAB student who seeks to further their foundational knowledge and practical skills that are expected of professionals pursuing careers in global health and international development. Students may choose from several online or classroom-based courses to meet the requirements for this program. Upon successful completion of program requirements, students will receive a graduate certificate awarded by the University of Alabama at Birmingham. In order to be enrolled in the graduate certificate program, you have to be enrolled as a student with the UAB Graduate School

(UAB Graduate Admissions). Undergraduate students may apply to the certificate program, but the certificate will not be awarded until a bachelor's degree is earned. This certificate can be used as part of UAB's master's degree program in Interdisciplinary Graduate Studies.

Upon completion of the GHS certificate program, participants will be able to:

- Analyze the relationship between global health and development.
- Use appropriate methods to appraise global health challenges and health care systems, as well as responses to these challenges.
- Synthesize information from primary and secondary sources to help identify appropriate interventions and actions in the field of global health.
- Use research, planning and management methods to make efficient and effective use of available resources in field settings.
- Develop professional skills in program design, program monitoring, and evaluation.

Program Format

Students are required to complete GHS 600 and GHS 601 for 6-credit hours, and an additional 9-credit hours of approved public health and global health courses for a total of 15-credit hours. Students must take a minimum of 6-credit hours from GHS & IDGH approved electives.

Admission Requirements

Currently enrolled UAB graduate students should apply by submitting the change of program form.

Applicants not currently enrolled at UAB should apply by completing an application through the UAB Graduate School.

Admissions requirements include:

- A bachelor's degree from a regionally accredited institution
- 3.0 GPA
- Statement of purpose

Undergraduate students in any major are eligible to apply to the GHS graduate certificate. An application must be submitted to the UAB Graduate School. To be considered for the certificate, student must have:

- At least a 3.5 GPA in undergraduate courses.
- Completed 60 undergraduate credit hours, and at least 36 hours at UAB.

Once admitted to the certificate, undergraduate student must meet the following:

- Maintain a 3.5 GPA in undergraduate courses.
- Receive a B or better in graduate courses taken while still an undergraduate student.
- Maintain full-time student status at UAB.

Any student who wishes to enroll into the GHS Certificate Program is responsible for meeting with his or her departmental coordinator and with the GHS program coordinator to ensure that all administrative requirements have been met. Any student who does not maintain a "B" average in his or her certificate courses is subject to dismissal from the certificate program.

Requirements		Hours
Global Health Studies Core (6 hours)		
GHS 600	Fundamentals of Global Health	3
GHS 601	Global Health Partnerships and Development	3
Global Health Studies & IDGH Approved Electives (6-9 hours)		
GHS 603	Immigrant, Migrant, Refugee Health	3
GHS 604	Infectious Diseases of Global Health Significance	3
GHS 605	Disabilities and Global Health	3
GHS 606	Critical Issues in Global Maternal and Child Health	3
GHS 607	Global Health and Gender	3
GHS 608	Food and Nutrition in Resource Limited Settings	2
GHS 609	Environmental Health in Resource Limited Settings	3
GHS 611	International NGO Management	3
GHS 645	Comparative Health Systems and Policy	3
GHS 649	Interprofessional Global Health Service Learning	3
GHS 630	Field Training in World Hunger and Malnutrition: Practical Skills to Make a Difference	3-6
GHS 690	Special Topics in Global Health	1-6
IDGH 620	Global Health Ethics	3
Other Electives (0-3 hours)		
ENH 610	Environmental Disasters	3
EPI 602	Epidemiology of Chronic Diseases	3
EPI 605	Epidemiology of Infectious Diseases	3
EPI 621	HIV/AIDS and STDs	3
HPO 608	Reproductive Health	3
HPO 631	Public Health Demography	3
HPO 628/728	Qualitative and Mixed Methods Research in Public Health	3
PUH 696	Exploring Population Health	6
Total Credit Hours:		**15**

Graduate Certificate in Disability Health Studies

Program Director: Dr. Teneasha Washington, teneasha@uab.edu

Program Director: Dr. Jereme Wilroy, jdwilroy@uab.edu,

Program Coordinator: Julie Brown, jebrown@uab.edu

Website: www.uab.edu/soph/home/graduate/programs/dhs-graduate-certificate

The 15-hour Disability Health Studies Graduate Certificate program will prepare masters', doctoral, post-doctoral, and post-masters' students with advanced knowledge and skills to develop, implement, evaluate, and disseminate programs promoting the health of individuals with disabilities. It is a unique program that will educate and train health professionals on inclusion and implementation science in the field of disability health.

Students may choose between courses in health behavior, health policy and organization, and administrative health services. Students may choose from several online or classroom-based courses to meet the program requirements.

Currently enrolled UAB graduate students should apply by submitting the change of program form.

Applicants not currently enrolled at UAB should apply by completing an application through the UAB Graduate School.

Program Format:

Online, In-Class

Admissions requirements include:

- A Bachelor's degree from a regionally accredited institution
- 3.0 GPA
- Statement of Purpose

Certificate students may apply for the MPH or other degree programs within the UAB School of Public Health and if admitted, the courses taken will be considered counting towards the completion of the degree program. If you have questions about the program prior to enrolling, please reach out to Julie Brown at jebrown@uab.edu.

Requirements		Hours
HB 613	Health Promotion Practices and Disability	3
HB 617	Implementation Science and Disability Health	3
Elective Option 1		**3**
HB 605	Physical Activity in Public Health	
HB 612	Examining Health Inequities in Social and Behavioral Sciences	
HB 624	Advanced Social and Behavioral Science Theory	
HB 630	Health Communications: Theory and Practice	
HB 643	Health Program Evaluation	
Elective Option 2		**3**
HPO 628	Qualitative and Mixed Methods Research in Public Health	
AH 785	Qualitative Research: Analysis and Interpretation	
Elective Option 3		**3**
AH 779	Mixed Methods Applications in Action and Community-Based Participatory Research	
AH 783	Writing Effective Mixed Methods Grant Proposals	
Total Hours		**15**

Graduate Certificate in LGBTQ Health and Wellbeing

Program Director: Dr. Sarah MacCarthy, smaccarthy@uab.edu

Program Coordinator: Julie Brown, jebrown@uab.edu

Website: www.uab.edu/soph/home/graduate/programs/lgbtq-grad-cert

The 15-hour LGBTQ Health and Wellbeing Graduate Certificate Program will provide advanced education in LGBTQ health to graduate and post-doctoral students at UAB seeking to enhance their skills regarding LGBTQ-related research and advocacy. It will prepare students and future professionals to have an immediate impact on LGBTQ inequities in the Deep South and throughout the nation. Graduate students may choose between courses in counseling, human services, psychology, and health behavior. Students may choose from several online or classroom-based courses to meet the requirements for this program. All students will participate in a service-learning in-person course led by UAB faculty and staff from Birmingham AIDS Outreach.

Currently enrolled UAB graduate students should apply by submitting the following change of program form.

Applicants not currently enrolled at UAB should apply by completing an application through the UAB Graduate School.

Program Format:

In-class

Admissions requirements include:

- A Bachelor's degree from a regionally accredited institution
- 3.0 GPA
- Statement of Purpose

Certificate students may apply for the MPH or other degree programs within the UAB School of Public Health and if admitted, the courses taken will be considered counting towards the completion of the degree program. If you have questions about the program prior to enrolling, please reach out to Julie Brown at jebrown@uab.edu

Requirements		Hours
HB 604	LGBTQ Health and Wellbeing Service Learning	3
HB 607	Introduction to LGBTQ Health	3
or HB 707	Introduction to LGBTQ Health	
Electives		**9**
ANTH 657	Anthropology of Gender	
ECG 628	Social and Cultural Diversity	
HB 600	Social and Behavioral Sciences in Public Health	
HB 601	LGBTQ Research Methods	
HB 615	Homelessness, Housing and Health	
PY 731	Health Psychology	
SW 653	Social Work Practice along the HIV Continuum of Care	
Total Hours		**15**

Interdisciplinary Programs

Master in Public Health with a Concentration in Population Health

The **MPH with a Concentration in Population Health** is a generalist degree that will train current public health or healthcare professionals to plan, design, implement, monitor, and evaluate public health programs and community-based interventions. This track is an individualized track that will allow students to pursue a public health degree that can be tailored to their own interests and career goals.

Upon admission into the program and under the guidance of their program coordinator, students will pick five unique competencies that best fit their personal and professional goals from amongst courses offered in each of the Departments. For additional information please see the program website: **MPH in Population Health**

Master of Science in Global Health and School of Medicine Joint Degree

The Master of Science in Global Health is a joint degree with the Heersink School of Medicine and the School of Public Health. There are two program pathways available for this degree, including a Thesis and a Non-Thesis option. For additional information about this degree through the School of Medicine, please visit this informational page: School of Public Health / Heersink School of Medicine Global Health.

Master of Science in Global Health

Thesis Option

Requirements		Hours
GHM 601	Global Health Foundations I	3
GHM 602	Global Health Foundations II	3
GHS 600	Fundamentals of Global Health	3
PUH 600	Overview of Public Health	3
IDGH 620	Global Health Ethics	3
IDGH 690	Writing for Global Health	5
GHM 604	Global Health Research Methods [1]	3
IDGH 699	Master's Directed Research	6
Global Health Electives		9
Total Hours		**38**

Non-Thesis Option

Requirements		Hours
GHM 601	Global Health Foundations I	3
GHM 602	Global Health Foundations II	3
GHS 600	Fundamentals of Global Health	3
PUH 600	Overview of Public Health	3
IDGH 620	Global Health Ethics	3
IDGH 690	Writing for Global Health	5
GHM 604	Global Health Research Methods [1]	3
IDGH 687	Global Health Scholarly Prep	3
IDGH 688	Scholarly Project Directed Research	4
Global Health Electives		6
Total Hours		**36**

[1] Other approved methods courses include: HCO 628, EPI 610, BST 621, BST 626, BST 611, HCO 609, HCO 631

Coordinated Degrees with other Graduate Programs

We offer students a wide range of **coordinated degree options**. Students can combine a Public Health MPH with a maximum of 14 professional degrees such as business, engineering, law, medicine, nursing, optometry, pharmacy, public administration, or social work. Students are admitted separately to each program. Students must complete the MPH Core plus 7 to 10 credit hours of MPH focus courses for a minimum of 30 credit hours in addition to the other program's curriculum requirements. A maximum of twelve credit hours from the other curriculum are credited toward the MPH degree for a minimum of 42 MPH credit hours. We also have a coordinated Master of Science in Public Health (MSPH) / MD with the UAB School of Medicine.

Students may complete the MPH degree program totally online, in class, or through a mix of online and in-class experiences. Out-of-state students taking online courses pay the same tuition rate as Alabama residents. The admissions processes are conducted separately, and admissions decisions are made independently by each school.

Program	Coordinator	Room	Phone Number
Coordinated Degree Programs	Meghan Walker	RPHB 130	(205) 934-2684

- (DVM/MPH) Coordinated Doctor of Veterinary Medicine (Auburn) / Master of Public Health (p. 565)
- (JD/MPH) Coordinated Juris Doctor / Master of Public Health (p. 566)
- (MBA/MPH) Coordinated Master of Business Administration / Master of Public Health (p. 566)
- (MD/MPH) Coordinated Doctor of Medicine / Master of Public Health (p. 567)
- (MD/MSPH) Coordinated Doctor of Medicine / Master of Science in Public Health (p. 567)
- ((p. 568)MPA/MPH) Coordinated Master of Public Administration / Master of Public Health (p. 568)
- (MSCE/MPH) Coordinated Master of Science in Civil Engineering / Master of Public Health
- (MSHA/MPH) Coordinated Master of Science in Health Administration / Master of Public Health (p. 568)
- (MS in Nutrition Sciences/MPH) Coordinated Master of Science in Nutrition Sciences, Dietetic Internship / Clinical Track/Master of Public Health (p. 569)
- (MSPAS/MPH) Coordinated Master of Science in Physician Assistant Studies / Master of Public Health (p. 570)
- (MSW/MPH) Coordinated Master of Social Work / Master of Public Health (p. 570)
- (OD/MPH) Coordinated Doctor of Optometry / Master of Public Health (p. 569)
- (Pharm D/MPH) Coordinated Pharm D/ Master of Public Health (p. 571)
- (PhD/MPH) Coordinated Doctor of Philosophy in Civil Engineering / Master of Public Health

UAB has many degree programs (both face-to-face and online) that can lead to professional licensure or certification. Licensure requirements vary from state to state and by professional organization. Federal Regulations require UAB to provide public or general disclosures on educational programs designed to meet educational requirements for a specific professional license or certification, that is required for employment in an occupation, or is advertised as meeting such requirements. For a list of programs that customarily lead to professional licensure or certification, please visit the UAB Professional Licensure and Certification webpage.

Coordinated Doctor of Veterinary Medicine (Auburn) / Master of Public Health Program

The DVM/MPH coordinated degree program is offered through the Office of Research and Graduate Studies at the **Auburn University College of Veterinary Medicine** (AUCVM) and the **UAB School of Public Health** (SOPH). MPH focus courses may be customized to the experience and needs of the student. Below is the MPH curriculum for this program, for information about the DVM curriculum please **click here**.

Students must complete the MPH Core plus 7 credit hours of MPH focus courses for a total of 30 credit hours in addition to the required DVM curriculum requirements. Twelve credit hours from the DVM curriculum are credited toward the MPH degree for a total of 42 MPH credit hours. Students may complete the MPH degree program totally online, in class, or through a mix of online and in class experiences.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Population Health Degree Requirement: (3 hours)		
PUH 610	Population Health	3
Approved Electives (7 hours):		
Select 7 credit hours of Public Health 600-699 level courses		7
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
or ENH 689	Environmental Health Sciences Integrative Learning Experience	
or EPI 689	Epidemiology Integrative Learning Experience	
or HPO 689	HPO Integrative Learning Experience	
Total SOPH Hours:		**30**
Credits from DVM at Auburn University (12 hours):		
VMED 9160: Veterinary Public Health		3
VMED 9190: Introduction to Veterinary Pharmacology		1
VMED 9250: Virology & Prions		2
VMED 9280: Bacteriology & Mycology		3
VMED 9720: Disaster Medicine for Veterinarians		1
VMED 9802: Data Analysis of Epidemiological Studies		1
VMED 9840: Wildlife Diseases		1
Total Credit Hours:		**42**

For additional information concerning the coordinated DVM/MPH program contact the School of Public Health at soph@uab.edu or Kelley Steury, DVM, MPH, in the Auburn University College of Veterinary Medicine at khb0008@auburn.edu.

Coordinated Juris Doctor / Master of Public Health Program

The School of Public Health offers a coordinated Master of Public Health and Juris doctor (MPH/JD) degree program in cooperation with the Cumberland School of Law at Samford University in Birmingham, Alabama. The purpose of the program is to offer future attorneys exposure to the broad areas of public health.

Curriculum

Students in this track must complete 43 credit hours. This includes the MPH Core, SOPH requirements, track requirements, electives and internship. A total of 90 credit hours of coursework are required for the coordinated JD/MPH. Normally, 42 credit hours are required for the MPH degree, however, because of the coordinated nature of the degree, 13 credit hours from the JD curriculum are credited to the MPH and 12 hours from the MPH curriculum are credited to the JD. Students may complete the MPH totally online, in class, or through a mix of online and in class experiences.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Population Health Degree Requirement: (3 hour)		
PUH 610	Population Health	3
Approved Electives: (7 hours)		
Select 7 credit hours of Public Health 600-699 level courses		7
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
or ENH 689	Environmental Health Sciences Integrative Learning Experience	
or EPI 689	Epidemiology Integrative Learning Experience	
or HPO 689	HPO Integrative Learning Experience	
Total SOPH Hours:		**30**
Shared Hours from JD Curriculum: (13 hours)		
Law 502: Torts		4
Law 506: Contracts I		3
Law 507: Contracts II		2
Law 526: Business Organizations		4
Total Credit Hours for the MPH:		**43**
Total Hours Completed for MPH/JD:		**90**

For additional information concerning the coordinated MPH/JD program contact the School of Public Health at soph@uab.edu or the Cumberland School of Law at Samford University at https://www.samford.edu/cumberlandlaw/.

Coordinated Master of Business Administration / Master of Public Health Program

This coordinated Master of Business Administration and Master of Public Health degree program is offered through the UAB Collat School of Business and the UAB School of Public Health. MPH focus courses may be customized to the experience and needs of the student.

The coordinated MBA/MPH program results in two advanced degrees providing students with skills necessary for a broad range of positions in health care management, entrepreneurship, and leadership. MPH coursework typically includes courses in the core public health disciplines as well as health economics, finance, accounting, management, strategic planning, health insurance, and health policy.

Curriculum

A total of 60 credit hours of coursework are required for the coordinated MBA/MPH. Courses include the Public Health Core plus 7 hours of

Public Health elective courses as well 10 MBA courses. Normally, 42 credit hours are required for the MPH and 36 credit hours for the MBA. However, because of the coordinated nature of the degree, 12 credit hours from the MBA curriculum are credited to the MPH and six hours from the MPH are credited to the MBA. Students may complete either degree programs totally online, in class, or through a mix of online and in class experiences.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Population Health Degree Requirement: (3 hours)		
PUH 610	Population Health	3
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
or ENH 689	Environmental Health Sciences Integrative Learning Experience	
or EPI 689	Epidemiology Integrative Learning Experience	
or HPO 689	HPO Integrative Learning Experience	
Approved Electives (7 hours):		
Select 7 credit hours of Public Health 600-699 level courses		7
Total SOPH Hours:		**30**
Shared Hours from MBA Program Curriculum: (12 hours)		
MBA 619	Information Technology and Business Strategy	3
MBA 631	Management and Organizations	3
MBA 642	Economics for Managers	3
MBA 651	Marketing Strategy	3
Total Hours Earned for MPH Degree:		**42**
Remaining MBA Program Requirements (18 hours):		
MBA 601	Accounting and Finance for Managers	3
MBA 608	Strategic Cost Analysis and Decision Making	3
MBA 621	Topics in Corporate Finance	3
MBA 634	Strategic Management	3
MBA 637	Operations and Supply Chain Management	3
MBA 662	Quantitative Analysis for Business Managers	3
Total Hours for both MPH/MBA Degrees:		**60**

Coordinated Doctor of Medicine / Master of Public Health Program

This coordinated degree program is offered through the UAB School of Medicine and the UAB School of Public Health. MPH focus courses may be customized to the experience and needs of the student.

Students may choose between two program formats: a four-year program or a five-year program.

- The four-year program requires students to complete MPH coursework while also completing medical school coursework. Additionally, students in the four-year program may begin taking courses the summer before they begin medical school.
- The five-year program requires students to take a one-year leave of absence from medical school to concentrate on MPH coursework.

Students may complete the MPH degree program totally online, in class, or through a mix of online and in class experiences.

Below are the courses required for the MPH degree, for information about the MD curriculum please click here.

Requirements		Hours
MPH Core Requirement: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Population Health Degree Requirement: (3 hours)		
PUH 610	Population Health	3
Approved Electives: (7 hours)		
Select 7 credit hours of Public Health 600-699 level courses		7
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
or ENH 689	Environmental Health Sciences Integrative Learning Experience	
or EPI 689	Epidemiology Integrative Learning Experience	
or HPO 689	HPO Integrative Learning Experience	
Total SOPH Hours:		**30**
Shared MD Curriculum: (12 hours)		
Public Health Scholarly Project		8
Special Topics - Public Health		4
Total Credit Hours:		**42**

For additional information concerning the coordinated MD/MPH program contact the School of Public Health at soph@uab.edu.

Coordinated Doctor of Medicine / Master of Science in Public Health Program

This MSPH/MD coordinated degree program is offered through the UAB School of Medicine and the UAB School of Public Health. The MSPH in Outcomes Research is offered in the Department of Health Policy and Organization and is an online program designed for medical students who also want to evaluate the effectiveness and cost-effectiveness of specific health care treatments.

Curriculum

The MSPH degree requires a minimum of 42 hours; however, 12 hours are shared from the Medical School curriculum.

Requirements		Hours
MSPH Core Requirements: (9 hours)		
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
EPI 610	Principles of Epidemiologic Research	3
Concentration Requirements: (21 hours)		
HPO 601	Health Economics	3
HPO 621	Clinical Decision Making and Cost-Effectiveness Analysis	3
HPO 623	Pharmacoeconomics and Regulation	3
HPO 670	Social and Ethical Issues in Public Health	3
HPO 677	Patient-Based Outcomes Measurement	3
HPO 687	Empirical Methods for Health Research	3
HPO 691	Policy Analysis: Modeling and Simulation	3
Shared MD Curriculum: (12 hours)		
Public Health Scholarly Project		8
Special Topics - Public Health		4
Total Credit Hours:		**42**

Coordinated Master of Public Administration/Master of Public Health Program

The coordinated Public Health/Public Administration (MPA) degree program is offered through the UAB School of Public Health and the UAB College of Arts and Sciences Department of Political Science and Public Administration. Students in this coordinated program earn an MPH with a focus in Population Health.

The MPH/MPA degree program provides students with the knowledge base of public health and the skills required to work effectively in a responsible, administrative position in the public sector. Through this coordinated degree program, students in the MPH program can satisfy some of their requirements through courses in the MPA program and vice versa.

Admission: Students entering this program must meet the minimum requirements for admission into the School of Public health. The student must apply to and be admitted to both programs. The Graduate School should be contacted for MPA application materials and the School of Public Health should be contacted for MPH application materials.

Curriculum

The MPA/MPH program requires the satisfactory completion of 60 credit hours. Students must complete both MPA and MPH core requirements. This is a coordinated dual degree track and, as such, graduation from one program is contingent upon completion of all requirements for graduation from the other program as some credits are shared between programs. This credit sharing allows students to earn both degrees in reduced time and at reduced cost. Students may complete the MPH degree program totally online, in class, or through a mix of online and in class experiences.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Population Health Degree Requirement: (3 hours)		
PUH 610	Population Health	3
Approved Electives: (7 hours)		
Select 7 credit hours of Public Health 600-699 level courses		7
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
or ENH 689	Environmental Health Sciences Integrative Learning Experience	
or EPI 689	Epidemiology Integrative Learning Experience	
or HPO 689	HPO Integrative Learning Experience	
Total SOPH Hours:		**30**
Shared Hours from MPA Curriculum: (12 hours)		
MPA 601	The Public Policymaking Process	3
MPA 602	Scope of Public Administration	3
MPA 604	Human Resources Management	3
MPA 607	Quantitative Methods for PA	3
Total Credit Hours for the MPH:		**42**
Remaining MPA Program Requirements:		**18**
Total Hours Earned for MPH/MPA Degree:		**60**

Coordinated Master of Science in Health Administration/Master of Public Health Program

The coordinated Master of Science in Health Administration and Master of Public Health (MSHA/MPH) degree program is offered through the UAB School of Health Professions and the UAB School of Public Health. MPH focus courses may be customized to the experience and needs of the student.

The coordinated MSHA/MPH program results in two advanced degrees providing students with management and leadership skills necessary for a broad range of administrative positions in health services organizations. The addition of an MPH to the MSHA degree provides students with a fuller and richer perspective of population and global health issues including the epidemiology of disease, health behavior, the impact of environmental and occupational factors on patient health, disease progression, management of disease states, drug and insurance policy issues, patient access to health care, as well as social, legal and ethical issues. In addition, the MPH degree broadens career opportunities, providing a foundation for positions in research, government, and international health as well as private industry.

Curriculum

Students must complete the MPH Core plus 7 credit hours of MPH focus courses for a total of 30 credit hours, in addition to the required MSHA curriculum requirements. Twelve credit hours from the MSHA curriculum are credited toward the MPH degree, for a total of 42 MPH credit hours. Students may complete the MPH program totally online, in class, or through a mix of online and in class experiences.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Population Health Degree Requirement: (3 hours)		
PUH 610	Population Health	3
Approved Electives: (7 hours)		
Select 7 credit hours of Public Health 600-699 level courses		7
Applied Practice Experience: (3 hours)		
HA 675	Health Administration Internship	3
or PUH 688	Public Health Internship	
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
or ENH 689	Environmental Health Sciences Integrative Learning Experience	
or EPI 689	Epidemiology Integrative Learning Experience	
or HPO 689	HPO Integrative Learning Experience	
Total SOPH Hours:		**30**
Shared Hours with MSHA Curriculum: (12 hours)		
HA 605	Health Policy and Politics in the U.S.	3
HA 612	Essentials of Health and Human Disease	3
HA 613	Health Law	3
HA 620	Healthcare Financial Management I	3
Total Earned Hours for MPH:		**42**
Total Hours Earned for MSHA Degree:		**59**
Total Hours for both MPH/MSHA Degrees:		**89**

Coordinated MS in Nutrition Sciences, Dietetic Internship / Clinical Track/Master of Public Health

This coordinated (MPH/MS) degree program is offered through the UAB School of Health Professions, Department of Nutrition Sciences and the UAB School of Public Health. MPH focus courses may be customized to the experience and needs of the student.

Drawing upon its distinguished history and a multidisciplinary team of physician-scientists, PhD scientists, registered/licensed dietitians, and nurses working together in patient care, research, and education programs; the MS in Nutrition Sciences, Dietetic Internship/Clinical Track offers an accelerated Master of Science degree from the Department of Nutrition Sciences that enables students to sit for the national exam to become a Registered Dietitian Nutritionist (RDN). This accredited program is offered on-campus or off-campus and combines supervised clinical practice with online graduate coursework. The MPH at the UAB School of Public Health prepares students for careers to improve the health and well being of individuals, families, communities and populations, locally and globally. This complementary MS/MPH dual coordinated degree program provides students with a fuller and richer perspective of community and global health issues including the epidemiology of disease, health behavior, the impact of environmental and occupational factors on patient health, disease progression, management of disease states, insurance policy issues, patient access to care, as well as social, legal and ethical issues.

Curriculum

Students must complete the MPH Core plus 7 credit hours of MPH focus courses for a total of 30 credit hours in addition to the required MS in Nutrition curriculum requirements. 12 credit hours from the MS in Nutrition curriculum are credited toward the MPH degree for a total of 42 MPH credit hours. Students may complete the MPH degree program totally online, in class, or through a mix of online and in class experiences.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Population Health Degree Requirement: (3 hours)		
PUH 610	Population Health	3
Approved Electives: (7 hours)		
Select 7 credit hours of Public Health 600-699 level courses		7
Applied Practice Experience: (3 hours)		
NTR 589	Internship Practicum	1-12
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
or ENH 689	Environmental Health Sciences Integrative Learning Experience	
or EPI 689	Epidemiology Integrative Learning Experience	
or HPO 689	HPO Integrative Learning Experience	
Total SOPH Hours:		**30**
Shared Hours from NTR Curriculum: (12 hours)		
NTR 621	Applied Statistics to Nutrition Sciences I	3
NTR 690	Seminar	2
NTR 637	Applied Research in Nutrition Sciences	3
NTR 500	Communications in Nutrition	1
NTR 601	Advanced Medical Nutrition	3
Total Hours Earned for MPH Degree:		**42**

Coordinated Doctor of Optometry/ Master of Public Health Program

This MPH/OD coordinated degree program is offered through the UAB School of Optometry and the UAB School of Public Health. MPH focus courses may be customized to the experience and needs of the student.

Curriculum

Students must complete the MPH Core plus 7 credit hours of MPH focus courses for a total of 30 credit hours in addition to the required OD curriculum requirements. 12 credit hours from the OD curriculum are credited toward the MPH degree for a total of 42 MPH credit hours. Students may complete the MPH degree program totally online, in class, or through a mix of online and in class experiences.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Population Health Degree Requirement: (3 hours)		
PUH 610	Population Health	3
Approved Electives: (7 hours)		
Select 7 credit hours of Public Health 600-699 level courses		7
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
or ENH 689	Environmental Health Sciences Integrative Learning Experience	
or EPI 689	Epidemiology Integrative Learning Experience	
or HPO 689	HPO Integrative Learning Experience	
Total SOPH Hours:		**30**
Credit from OD Curriculum (12 hours):		
OPT 133	Clinical Ophthalmic Optics	
OPT 324	Business Aspects of Optometry	
CLN 222	Community Eye Care II	
CLN 233	Community Eye Care III	
Total Credit Hours for the MPH:		**42**

Coordinated Master of Science in Physician Assistant Studies / Master of Public Health Program

The coordinated Master of Science in Physician Assistant Studies and Master of Public Health (MSPAS/MPH) degree program, offered through the UAB School of Health Professions and UAB School of Public Health, provides students with important skills for dealing with population health issues. MPH focus courses may be customized to the experience and needs of the student.

The coordinated graduate degree program provides opportunities for interdisciplinary collaboration and a public health practice experience with rural primary care clinical community partners. This innovative program enhances physician assistant education with integrated training in public health and primary care and thereby provides students with the information and skills needed to monitor and assess community health, develop and analyze programs and policies, coordinate and integrate care, and utilize appropriate population health measures in quality improvement strategies.

Curriculum

Students must complete the MPH Core plus 7 credit hours of MPH focus courses for a total of 30 credit hours in addition to the required MSPAS curriculum requirements. 12 credit hours from the MSPAS curriculum are credited toward the MPH degree for a total of 42 MPH credit hours. Students may complete the MPH degree program totally online, in class, or through a mix of online and in class experiences.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Population Health Degree Requirement: (3 hours)		
PUH 610	Population Health	3
Approved Electives: (7 hours)		
Select 7 credit hours of Public Health 600-699 level courses		7
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
or ENH 689	Environmental Health Sciences Integrative Learning Experience	
or EPI 689	Epidemiology Integrative Learning Experience	
or HPO 689	HPO Integrative Learning Experience	
Total SOPH Hours:		**30**
Shared Hours from MSPAS Curriculum: (12 hours)		
PA 617	Applied Behavioral Medicine	3
PA 618	Risk Management	1
PA 619	Fundamentals of Clinical Research	2
PA 620	Analysis of Professional Literature	2
PA 633	Navigating Healthcare Delivery and Reimbursement Systems for Physician Assistants	2
PA 635	Special Populations in Medicine	2
Total Hours Earned for MPH Degree:		**42**

Coordinated Master of Social Work/Master of Public Health Program

The MPH/MSW degree program is coordinated between the **School of Social Work at the University of Alabama (MSW)** and the **UAB School of Public Health**. MPH focus courses may be customized to the experience and needs of the student.

Curriculum

Students in the traditional track must complete the MPH Core plus 7 credit hours of MPH focus courses for a total of 30 credit hours in addition to the required MSW curriculum requirements. Twelve credit hours from the MSW curriculum are credited toward the MPH degree for a total of 42 MPH credit hours. Students in the advanced track must complete the MPH Core plus 10 credit hours of MPH focus courses for a total of 33 credit hours in addition to the required MSW curriculum requirements.

Nine credit hours from the MSW curriculum are credit toward the MPH degree for a total of 42 MPH credit hours.

Students may complete the MPH degree program totally online, in class, or through a mix of online and in class experiences. Out-of-state online students pay the same tuition rate as Alabama residents.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Population Health Degree Requirement: (3 hours)		
PUH 610	Population Health	3
Approved Electives: (7 hours Traditional Track, 10 hours Advanced Track)		
Select 7-10 credit hours of Public Health 600-699 level courses		7-10
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
or ENH 689	Environmental Health Sciences Integrative Learning Experience	
or EPI 689	Epidemiology Integrative Learning Experience	
or HPO 689	HPO Integrative Learning Experience	
Total SOPH Hours:		**30**
Traditional Track Shared Hours from MSW Curriculum: (12 hours)		
SW 500: Social Welfare Policy		3
SW 510: Human Behav Social Envir I		3
SW 542: Practice w/ Communities & Orgs		3
SW 570: Research Informed Practice		3
OR		
Advanced Track Shared Hours from MSW Curriculum: (9 hours)		
SW 501: Soc Welfare Adv Pol Analysis		3
SW 577: Human Develop & Social Systems		3
SW 578: Social Welfare Policy		3
Total Credit Hours for MPH:		**42**

Coordinated Doctor of Pharmacy / Master of Public Health Program

This coordinated MPH/PharmD degree program is offered through the UAB School of Public Health and either the Auburn University Harrison School of Pharmacy or the Presbyterian College School of Pharmacy. MPH focus courses may be customized to the experience and needs of the student.

The Auburn Doctor of Pharmacy (PharmD) degree program is a four-year course of study that requires the completion of the pre-pharmacy curriculum prior to enrollment and includes course work in biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; pharmacy practice; and pharmacy practice experience.

The Presbyterian College School of Pharmacy (PharmD) Pharmacy school consists of 4 years of coursework and pharmacy practice experiential education leading to the Doctor of Pharmacy degree. Admission to pharmacy school is competitive, and students may apply after completing 2 – 3 years of required pre-pharmacy coursework.

The MPH degree prepares students for careers to improve the health and well being of individuals, families, communities and populations, locally and globally. This complementary coordinated degree program provide students with a fuller and richer perspective of community and global health issues including the epidemiology of disease, health behavior, the impact of environmental and occupational factors on patient health, disease progression, management of disease states, drug and insurance policy issues, patient access to drug therapy, as well as pharmaceutical social, legal and ethical issues.

Curriculum

Students must complete the MPH Core plus 7 credit hours of MPH focus courses for a total of 30 credit hours in addition to the required PharmD curriculum requirements. Up to 13 credit hours from the designated PharmD curriculum are credited toward the MPH degree for a total of 42-43 MPH credit hours. Students may complete the MPH degree program totally online, in class, or through a mix of online and in class experiences.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Population Health Degree Requirement: (3 hours)		
PUH 610	Population Health	3
Approved Electives: (7 hours)		
Select 7 credit hours of Public Health 600-699 level courses		7
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
or ENH 689	Environmental Health Sciences Integrative Learning Experience	
or EPI 689	Epidemiology Integrative Learning Experience	
or HPO 689	HPO Integrative Learning Experience	
Total SOPH Hours:		**30**
Shared Credits from Auburn Curriculum: (13 hours)		
PYPD 9320: Longitudinal Experience 1		3
PYPD 9600: Advanced Practice Pharmacy Experience		5
PYPD 9600: Advanced Practice Pharmacy Experience		5
OR		
Shared Credit Hours from Presbyterian College Curriculum: (12 hours)		
PHRM 5111: Introduction to Pharmacy and Healthcare Systems		3
PHRM 7109: Clinical Research Design and Biostatistics (course number updating 24/25 Catalog year)		2
PHRM 7209: Pharmacy Law and Ethics		2
PHRM 8121: Advanced Community Pharmacy Practice Experience		4

PHRM 5102: Drug Literature Evaluation (course number updating 24/25 Catalog year)	1
Total Credit Hours for the MPH/PharmD Degree:	**42-43**

Master of Public Health with a Concentration in Population Health

Master of Public Health with a Concentration in Population Health

Including the Online Degree Program

The MPH in Population Health is a generalist degree that will train current public health or healthcare professionals to plan, design, implement, monitor, and evaluate public health programs. This individualized track will allow students to pursue a public health degree that can be tailored to their own interests and career goals.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Population Health Degree Requirement: (3 hours)		
PUH 610	Population Health	3
Approved Electives: (19 hours)		
Select 19 hours of 600-level or higher courses		19
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
or ENH 689	Environmental Health Sciences Integrative Learning Experience	
or EPI 689	Epidemiology Integrative Learning Experience	
or HPO 689	HPO Integrative Learning Experience	
Total Credit Hours:		**42**

Upon admission into the program and under the guidance of their program coordinator, students will pick five unique competencies that best fit their personal and professional goals from amongst courses offered in each of the Departments.

Biostatistics

Degree Offered:	Certificate, MSPH, MS, DrPH, PhD
Chair:	Jeff M. Szychowski, PhD
Phone:	(205) 934-4905
E-mail:	bstgrad@uab.edu
Website:	www.uab.edu/soph/home/biostatistics
Department Contact:	Nicole Cross, MA
Department Contact Email:	nicolen@uab.edu

Overview

The Department of Biostatistics at the University of Alabama at Birmingham (UAB) is one of five departments in the School of Public Health: Biostatistics, Environmental Health Sciences, Epidemiology, Health Behavior, and Health Policy and Organization.

Dr. Jeff Szychowski is the Chair of the department and Dr. Stacey Cofield is the Vice Chair for Education and Graduate Program Director. With 4 degrees and a graduate certificate, the department offers master's and doctoral-level courses in applied and theoretical research methods, statistical genetics, and clinical trials. The department currently has 27 faculty members with research focus in statistical methodology and applications, as well as in fundamental problems of modeling in biological systems. Much of the departmental research is collaborative in nature involving projects from basic science, genetics, clinical medicine, public health, and other health-related areas, both within and outside of UAB. Grant support for faculty in the department fall into four broad areas: applied grants involving the application of statistical methods to health-related issues, statistical coordinating centers for large multi-center randomized clinical trials and cohort studies, methodological grants advancing statistical techniques, and training grants for preparing the next generation of statisticians.

Degree Programs

- Doctor of Philosophy (PhD) in Biostatistics
- Doctor of Public Health (DrPH) concentration in Biostatistics
- Master of Science (MS) in Biostatistics
- Master of Science in Public Health (MSPH) concentration in Biostatistics
- Graduate Certificate in Applied Biostatistics and Epidemiology

Admissions

Students with a firm foundation in advanced calculus and linear algebra are considered for admission to the MS or doctoral programs (PhD, DrPH). Students without advanced calculus will be considered for the MSPH or Certificate. There are no specific undergraduate majors required for admissions. A master's degree is recommended but not required for admissions to doctoral programs, and a prior MPH is not required for admission to DrPH program. For the initial application review, unofficial transcripts are permitted (if from an institution outside the US, transcripts will be evaluated prior to review). If offered admission, official documents will be required.

Entry Term	Deadline
Master Program Deadline:	www.uab.edu/soph/home/apply/graduate
Doctoral Program Deadline:	Priority deadline December 1, Final deadline May 1 (U.S.), April 1 (International)
Number of Evaluation Forms Required:	Three

Entrance Tests: GRE	www.uab.edu/soph/home/apply/graduate
TOEFL:	TOEFL is required for international applicants whose native language is not English.
GPA:	3.0 minimum, B or higher in linear algebra and calculus courses for doctoral and MS degrees
International Transcripts:	International transcripts must be submitted to World Education Services (WES) or Educational Credential Evaluators (ECE) for an official course-by-course credential evaluation (document-by-document evaluations will not suffice).
SOPH Admissions:	www.uab.edu/soph/home/apply/graduate

UAB has many degree programs (both face-to-face and online) that can lead to professional licensure or certification. Licensure requirements vary from state to state and by professional organization. Federal Regulations require UAB to provide public or general disclosures on educational programs designed to meet educational requirements for a specific professional license or certification, that is required for employment in an occupation, or is advertised as meeting such requirements. For a list of programs that customarily lead to professional licensure or certification, please visit the UAB Professional Licensure and Certification webpage.

Master of Science in Biostatistics

The **Department of Biostatistics** offers an MS degree in Biostatistics. This program provides a balance between theory and application, the perspective being the role of statistics and modeling in scientific research. The objective is to produce research-oriented scientists who anticipate a career performing data management and statistical analysis. Further, the MS program is the appropriate program to prepare students to enter the PhD program.

For admission to the program applicants should have a strong academic record and meet the minimum requirements for admission to the School of Public Health**.** In addition, the applicant's prior collegiate curriculum must include a 3-semester sequence of calculus or equivalent and linear algebra. Proficiency in computing is preferred, as are additional advanced mathematics courses, e.g., differential equations, advanced calculus including special functions, and complex analysis. Some background in the natural sciences would be helpful. The Department of Biostatistics admits MS students in the fall term each year. Interested students should apply online through the UAB Graduate School.

Curriculum

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

Requirements		Hours
Departmental Requirements: (27 hours)		
BST 621	Statistical Methods I	3
BST 622	Statistical Methods II	3
BST 623	General Linear Models	3
BST 626	Data Management and Reporting with SAS	3
BST 631	Statistical Theory I	4
BST 632	Statistical Theory II	4
BST 655	Categorical Data Analysis	3
BST 691	Pre-Doctoral Seminar Series [1]	1
BST 691	Pre-Doctoral Seminar Series	1
BST 691	Pre-Doctoral Seminar Series	1
BST 691	Pre-Doctoral Seminar Series	1
Biostatistics Electives: (Minimum 6 credit hours)		
BST 665	Survival Analysis (Highly Recommended)	3
BST courses of 624 or higher level		3
Required Public Health/Medical/Biological Electives: (Minimum 6 credit hours)		
EPI 610	Principles of Epidemiologic Research	3
Other Elective		3
Master's Directed Research: (Minimum of 6 credit hours)		
BST 698	Non Thesis Research	6
Total Credit Hours:		**45**

[1] BST 691 - Minimum 4 hours required.

Master of Science in Public Health (MSPH) with a Concentration in Biostatistics

Master of Science in Public Health with a concentration in Biostatistics is an applied statistics degree with a focus on Public Health. This program is open to all qualified applicants with relevant undergraduate, masters, medical, or health science professional degree. For fellows and faculty members interested in developing skills required for clinical research, this program is an ideal post-medical or other health science degree training program. It is anticipated that this academic training will supplement extensive training in the content area in which the student is trained, and senior mentoring in the politics and policies of development and management. A graduate of this program will have the academic training to develop and lead independent research programs and projects.

For admission to the MSPH program applicants should have a strong academic record and meet the minimum requirements to the School of Public Health. In addition, the applicant's undergraduate curriculum must include a 2-semester sequence of calculus or equivalent, linear algebra, and proficiency in computing. The Department of Biostatistics admits MSPH students in the fall term each year. Interested students should apply online through the Schools of Public Health Application Service (SOPHAS).

Curriculum

The MSPH in Biostatistics consists of a minimum of 41 credit hours. Of these, 20 hours are required, including 15 hours of specific biostatistics courses and 5 hours of specific epidemiology courses. Students then select at least 9 hours from a list of approved Masters Research

Electives, complete 3 hours of focus specific electives in biostatistics, and take at least 9 hours of directed (698 level) masters research to fulfill the MSPH requirement for conducting a research project.

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

Requirements		Hours
MSPH Core Requirement: (20 hours)		
BST 621	Statistical Methods I	3
BST 622	Statistical Methods II	3
BST 623	General Linear Models	3
BST 625	Design/Conduct Clinical Trials	3
BST 655	Categorical Data Analysis	3
EPI 610	Principles of Epidemiologic Research	3
EPI 680	Topics in Clinical Research [1]	2
Masters Research Selectives: (Minimum of 9 credit hours)		
BST 613	Intermediate Statistical Analysis III	3
BST 626	Data Management and Reporting with SAS	3
ENH 650	Essentials of Environmental and Occupational Toxicology and Diseases	3
EPI 625	Quantitative Methods in Epidemiology	3
EPI 703	Grant Proposal Writing	3
HB 624	Advanced Social and Behavioral Science Theory	3
HPO 677	Patient-Based Outcomes Measurement	3
Concentration Select BST Courses: (Minimum 3 credit hours)		
BST courses of 624 or higher level		3
Master's Directed Research: (Minimum 9 credit hours)		
BST 698	Non Thesis Research	9
Total Credit Hours:		**41**

1 EPI 680 is a two credit hour class which students attend and participate in lectures provided through the K40 Clinical Studies program at the School of Medicine. The grading is on a Pass/No Pass basis. To earn a grade of Pass, students must attend a minimum of 80% of the lectures over two semesters and participate in all discussions during which they are present (beginning the spring semester prior to registering for summer).

Doctor of Philosophy in Biostatistics

The **Department of Biostatistics** offers a PhD degree in biostatistics. This program provides a balance between theory and application, the perspective being the role of statistics and modeling in scientific research. The objective is to produce research-oriented scientists who can advance statistical and modeling theory and can interact effectively with scientists in other disciplines to advance knowledge in those fields.

For admission to the program applicants should have a strong academic record and meet the minimum requirements for admission to the School of Public Health. In addition, the applicant's prior collegiate curriculum must include a 3-semester sequence of calculus or equivalent and linear algebra. Proficiency in computing is preferred, as are additional advanced mathematics courses, e.g., differential equations, advanced calculus including special functions, and complex analysis. Some background in the natural sciences would be helpful. In most cases, a prior MS in biostatistics, statistics, or related field are required for admission to the PhD program. Students with a bachelor's degree are encouraged to pursue a MS degree in Biostatistics before applying to the PhD program. The Department of Biostatistics admits PHD students in the fall term each year. Interested students should apply online through the UAB Graduate School.

Curriculum

To earn the PhD degree in Biostatistics students must complete a minimum of 87 total credit hours of academic course work. Of these, 45 hours are required core courses and 3 hours are required Graduate School courses. Students then select a minimum 9 credit hours of regular Biostatistics Elective courses of 624 or higher#level; a minimum 6 graduate credit hours of outside electives must be taken from a non#quantitative field (i.e. Biology, Public Health or Medicine) with advisor's approval and in some cases, also approval of instructor; and at least 24 credit hours of other related courses including dissertation research.

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

Requirements		Hours
Departmental Requirements: (45 hours)		
BST 621	Statistical Methods I	3
BST 622	Statistical Methods II	3
BST 623	General Linear Models	3
BST 626	Data Management and Reporting with SAS	3
BST 631	Statistical Theory I	4
BST 632	Statistical Theory II	4
BST 655	Categorical Data Analysis	3
BST 665	Survival Analysis	3
BST 691	Pre-Doctoral Seminar Series [1]	1
BST 691	Pre-Doctoral Seminar Series	1
BST 691	Pre-Doctoral Seminar Series	1
BST 691	Pre-Doctoral Seminar Series	1
BST 691	Pre-Doctoral Seminar Series	1
BST 691	Pre-Doctoral Seminar Series	1
BST 723	Theory of Linear Models	3
BST 735	Advanced Inference	4
BST 760	Generalized Linear and Mixed Models	3
BST 765	Advanced Computational Methods	3
School-Wide Requirement: (3 hours) [2]		
GRD 717	Principles of Scientific Integrity	3
Biostatistics Electives: (Minimum 9 credit hours)		
700 level BST Courses		9
Required Public Health/Medical/Biological Electives: (Minimum 6 credit hours)		
EPI 610	Principles of Epidemiologic Research	3
Non-Quantitative Elective (600 and 700 level courses)		3
Other Related Courses including Research in Statistics (BST 698/798)		
BST 798	Non-Dissertation Research	1-12
Other Related Courses including Dissertation Research (BST 799) [3]		

BST 799	Dissertation Research	1-12
Minimum Credit Hours:		**87**

1 BST 691 - minimum 6 hours required

2 At least one (1) course related to research ethics and scientific integrity. Does not count toward the required 24 credit hours of didactic course work.

3 Two semesters in candidacy and either (1) 24 credit hours of BST 799 or (2) 12 credit hours of BST 799 and 12 credit hours of research#based coursework (approved by Program Director)

Doctor of Public Health with a Concentration in Biostatistics

Biostatistics uses statistical reasoning and methods to address major problems in public health. Students who concentrate in biostatistics are interested in how data, population studies, and health intersect. They study advanced statistical methodologies and apply them to better understand health trends among populations. Biostatistics students interpret results of statistical analyses from public health studies and translate the information into easily understandable facts for scientific and non-scientific audiences.

Curriculum

The DrPH Concentration in Biostatistics consists of a minimum of 51 credit hours, depending upon the applicant prior academic history. For students with a graduate degree and/or public health experience, credits will range from 51-71 hours. For students with an undergraduate degree, credits will range from 71-80 hours. If applicants have an undergraduate Public Health Degree from UAB, and MPH, or other public health degree or 1 year of public health work experience, electives and potentially core requirements can be adjusted at the discretion of the Graduate Program Committee (minimum of 51 credit hours must be met, regardless of courses transferred or waived). Students entering with prior biostatistics graduate work may be able to waive some core biostatistics courses at the discretion of the Graduate Program Committee (GPC).

All degrees require 15 credit hours of Biostatistics or Public Health elective courses designed with the student, advisor, Graduate Program Committee and permission of instructor, where applicable. Students would need to meet prerequisites for all courses and some decisions would be made in conjunction with other Departments.

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

Requirements		Hours
DrPH Core Requirements: (9 hours)		
HPO 716	Advanced Leadership and Practice Seminar	3
HPO 717	Seminar in Public Health Policy	3
GRD 717	Principles of Scientific Integrity	3
or HPO 670	Social and Ethical Issues in Public Health	
Biostatistics Requirements: (23 hours) [1]		
BST 621	Statistical Methods I	3
BST 622	Statistical Methods II	3
BST 623	General Linear Models	3
BST 626	Data Management and Reporting with SAS	3
BST 630	Estimation & Inference	3
BST 655	Categorical Data Analysis	3
BST 665	Survival Analysis	3
EPI 680	Topics in Clinical Research [2]	2
Public Health Electives: (Minimum 9 credit hours)		
ENH 650	Essentials of Environmental and Occupational Toxicology and Diseases	3
EPI 625	Quantitative Methods in Epidemiology	3
EPI 703	Grant Proposal Writing	3
HB 624	Advanced Social and Behavioral Science Theory	3
HPO 677	Patient-Based Outcomes Measurement	3
Required Public Health/Biostatistics/Medical Science Selectives: (Minimum 15 credit hours)		
Courses 600 level or higher, designed with Advisor & GPC		15
Other related courses including Dissertation Research (BST 799)		
BST 625	Design/Conduct Clinical Trials	3
BST 790	DrPH Applied Practice Experience	3-6
BST 799	Dissertation Research	1-12
EPI 610	Principles of Epidemiologic Research	3
Minimum Credit Hours:		**71-80**

1 BST Requirements - prior graduate level BST courses may be waived at discretion of BST Graduate Program Committee

2 EPI 680 is a two credit hour class which students attend and participate in lectures provided through the K40 Clinical Studies program at the School of Medicine. The grading is on a Pass/No Pass basis. To earn a grade of Pass, students must attend a minimum of 80% of the lectures over two semesters and participate in all discussions during which they are present (beginning the spring semester prior to registering for summer).

Courses

BST 601. Biostatistics. 4 Hours.
Logic and language of scientific methods in life science research; use of basic statistics in testing hypotheses and setting confidence limits. Simple and multiple regression and elementary experimental designs. BST 601 is a 4-credit course for MPH students. There are no formal prerequisites for this course; however, familiarity and comfort with basic mathematical concepts is essential. The minimum technical skills required include the ability to use Adobe Acrobat, Word, Excel, and PowerPoint. If you are deficient in any of these areas, it is your responsibility to improve your skills before starting the course.

BST 603. Introductory Biostatistics for Graduate Biomedical Sciences. 3 Hours.
This course will utilize current statistical techniques to assess and analyze health science related data.

BST 611. Intermediate Statistical Analysis I. 3 Hours.
Students will gain a thorough understanding of basic analysis methods, elementary concepts, statistical models and applications of probability, commonly used sampling distributions, parametric and non-parametric one and two sample tests, confidence intervals, applications of analysis of two-way contingency table data, simple linear regression, and simple analysis of variance. Students are taught to conduct the relevant analysis using current software such as the Statistical Analysis System (SAS).

BST 612. Intermediate Statistical Analysis II. 3 Hours.
This course will introduce students to the basic principles of tools of simple and multiple regression. A major goals is to establish a firm foundation in the discipline upon which the applications of statistical and epidemiologic inference will be built. If prerequisite is not met, permission of instructor is required.
Prerequisites: BST 611 [Min Grade: C]

BST 613. Intermediate Statistical Analysis III. 3 Hours.
This course will introduce students to additional general concepts in biostatistics beyond an introductory level to include study design, power and sample size estimation, mixed-models, survival analysis, survey design and interpretation of research results. We recommend a prior statistics/biostatistics course that included hypothesis testing for proportions and means, ANOVA, correlation, simple and multiple linear regression, and logistic regression (with approval of the instructor).
Prerequisites: BST 611 [Min Grade: C] and BST 612 [Min Grade: C]

BST 619. Data Collection and Management. 3 Hours.
Basic concepts of study design, forms design, quality control, data entry, data management and data analysis. Hands-on experience with data entry systems, e.g., DBASE, and data analysis software, e.g., PC-SAS. Exposure to other software packages as time permits. Previous computer experience or workshop on microcomputers highly recommended. NOTE: If space permits, non-degree graduate students will be permitted to enroll. All students registered for the course must attend 1st class to remain enrolled. Previous computer experience or workshop on microcomputers highly recommended.
Prerequisites: BST 611 [Min Grade: C] or BST 621 [Min Grade: C]

BST 620. Applied Matrix Analysis. 3 Hours.
Vector and matrix definitions and fundamental concepts; matrix factorization and application. Eigen-values and eigen-vectors, functions of matrices, singular and ill-conditioned problems.
Prerequisites: BST 622 [Min Grade: C]

BST 621. Statistical Methods I. 3 Hours.
Mathematically rigorous coverage of applications of statistical techniques designed for Biostatistics majors and others with sufficient mathematical background. Statistical models and applications of probability; commonly used sampling distributions; parametric and nonparametric one and two sample tests and confidence intervals; analysis of two-way contingency table data; simple linear regression; simple analysis of variance designs with equal or proportional subclass members; use of contrasts and multiple comparisons procedures; introduction to survival analysis; multivariate methods. Interested students must have a year of calculus sequence before enrolling in BST 621.

BST 622. Statistical Methods II. 3 Hours.
Mathematically rigorous coverage of applications of statistical techniques designed for Biostatistics majors and others with sufficient mathematical background. Statistical models and applications of probability; commonly used sampling distributions; parametric and nonparametric one and two sample tests and confidence intervals; analysis of contingency tables; simple linear regression; simple analysis of variance designs with equal or proportional subclass members; use of contrasts and multiple comparisons procedures; introduction to survival analysis; multivariate methods.
Prerequisites: BST 621 [Min Grade: B](Can be taken Concurrently)

BST 623. General Linear Models. 3 Hours.
Simple and multiple regression using matrix approach; weighted and non-linear regression; variable selection methods; modeling techniques; regression diagnostics and model validation; systems of linear equations; factorial designs; blocking; an introduction to repeated measures designs; Coding schemes.
Prerequisites: BST 622 [Min Grade: B]

BST 624. Experimental Design. 3 Hours.
BST 624 provides intermediate level training for the design of experiments in biomedical research. It will cover classical experimental designs including factorial and nested (hierarchical) designs, Latin squares, incomplete block designs, and fractional factorials. It will use a matrix approach to analysis. In addition, it will emphasize statistical methodology and communication of procedures, results, and conclusions. Students are expected to have prior coursework in calculus and matrix algebra. Additional prerequisites include successful completion (B or higher) in either the BST 621/622 sequence or the BST 611/612 sequence.
Prerequisites: (BST 621 [Min Grade: B] and BST 622 [Min Grade: B]) or (BST 611 [Min Grade: B] and BST 612 [Min Grade: B])

BST 625. Design/Conduct Clinical Trials. 3 Hours.
Concepts of clinical trials; purpose, design, implementation and evaluation. Examples and controversies presented.
Prerequisites: (BST 611 [Min Grade: B] and BST 612 [Min Grade: B]) or (BST 611Q [Min Grade: B] and BST 612Q [Min Grade: B]) or (BST 621 [Min Grade: B] and BST 622 [Min Grade: B])

BST 626. Data Management and Reporting with SAS. 3 Hours.
This course is designed to provide an introduction to data management and reporting using the SAS system.

BST 630. Estimation & Inference. 3 Hours.
This course is an introduction to probability concepts and statistical inference. Topics include counting techniques, discrete and continuous univariate and multivariate random variables & common distributions, probability, expectation, variance, confidence intervals, the Central Limit Theorem, and hypothesis testing. Restricted to MSPH and DrPH students. Preq: Calculus II.

BST 631. Statistical Theory I. 4 Hours.
Fundamentals of probability; independence; distribution and density functions; random variables; moments and moment generating functions; discrete and continuous distributions; exponential families, marginal and conditional distributions; transformation and change of variables; convergence concepts, sampling distributions. Point and interval estimation; hypothesis and significance testing; sufficiency and completeness; ancillary statistics; maximum likelihood and moment estimators; asymptotic properties of estimators and tests; introduction to Bayesian inference. Prerequisites: Proficiency in Algebra and calculus is required.

BST 632. Statistical Theory II. 4 Hours.
Fundamentals of probability; independence; distribution and density functions; random variables; moments and moment generating functions; discrete and continuous distributions; exponential families, marginal and conditional distributions; transformation and change of variables; convergence concepts, sampling distributions. Point interval estimation; hypothesis and significance testing; sufficiency and completeness; ancillary statistics; maximum likelihood and moment estimators; asymptotic properties of estimators and tests; introduction to Bayesian inference.
Prerequisites: BST 631 [Min Grade: B]

BST 640. Nonparametric Methods. 3 Hours.
Properties of statistical tests; order statistics and theory of extremes; median tests; goodness of fit; tests based on ranks; location and scale parameter estimation; confidence intervals; association analysis; power and efficiency.
Prerequisites: BST 621 [Min Grade: C] and BST 631 [Min Grade: C]

BST 655. Categorical Data Analysis. 3 Hours.
Intermediate level course with emphasis on understanding the discrete probability distributions and the correct application of methods to analyze data generated by discrete probability distributions. The course covers contingency tables, Mantel-Haenszel test, measures of association and of agreement, logistic regression models; regression diagnostics; proportional odds; ordinal and polytomous logistic regression; Poison regression; log linear models; analysis of matched pairs; and repeated categorical data.
Prerequisites: BST 621 [Min Grade: B] and BST 622 [Min Grade: B]

BST 660. Applied Multivariate Analysis. 3 Hours.
Analysis and interpretation of multivariate general linear models including multivariate regression, multivariate analysis of variance/covariance, discriminant analysis, multivariate analysis of repeated measures, canonical correlation, and longitudinal data analysis for general and generalized linear models. Extensive use of SAS, SPSS, and other statistical software.
Prerequisites: BST 623 [Min Grade: B]

BST 661. Structural Equation Modelling. 3 Hours.
Basic principles of measurements; factor analysis and latent variable models; multivariate predictive models including mediation mechanisms and moderators effects;path analysis;intergrative mutivariate covariance models, methods of llongitudinal analysis.
Prerequisites: BST 623 [Min Grade: C]

BST 665. Survival Analysis. 3 Hours.
Kaplan-Meier estimation; Parametric survival models; Cox proportional hazards regression models; sample size calculation for survival models; competing risks models; multiple events models.
Prerequisites: BST 622 [Min Grade: B](Can be taken Concurrently)

BST 670. Sampling Methods. 3 Hours.
Simple random, stratified, cluster, ratio regression and systematic sampling; sampling with equal or unequal probabilities of selection; optimization; properties of estimators; non-sampling errors; sampling schemes used in population research; methods of implementation and analyses associated with various schemes.
Prerequisites: BST 631 [Min Grade: C]

BST 671. Meta-Analysis. 3 Hours.
Statistical methods and inference through meta analysis.
Prerequisites: BST 622 [Min Grade: C] and BST 632 [Min Grade: C]

BST 675. Introduction to Statistical Genetics. 3 Hours.
This class wil introduce students to population genetics, genetic epidemiology, microarray and proteomics analysis, Mendelian laws, inheritance, heritability, test cross linkage analysis, QTL analysis, human linkage and human association methods for discrete and quatitative traits.

Prerequisites: BST 611 [Min Grade: C] or BST 621 [Min Grade: C]

BST 676. Genomic Data Analysis. 3 Hours.
The purpose of this class is to teach graduate students practical skills and statistics concepts and methods that underlie the analysis of high-dimensional genomic big data generated by high throughput technologies, as well as issues in the experimental design and implementation of these technologies. Lectures contents will be delivered often with live demonstrations. Afterwards, students will be immersed by practical problem solving sessions. The R language will be used for programming throughout the course.
Prerequisites: BST 611 [Min Grade: B] or BST 621 [Min Grade: B]

BST 680. Statistical Computing with R. 3 Hours.
This course is mainly focused on R and how to use R to conduct basic statistical computing. The course contains three themes: R programming, introduction to high performance computing, and basics of statistical computing.
Prerequisites: BST 621 [Min Grade: C] and BST 622 [Min Grade: C] and BST 626 [Min Grade: C]

BST 685. Training in Biostatistics Teaching. 3 Hours.
Acquire skills for teaching in higher education, including syllabus design, communication skills for the classroom and office hours, creating assignments and rubrics, preparing and giving lectures, preparing nondidactic content, and effective grading. Prerequisites: Must have completed the course that you will be the TA, or similar course, in a prior semester with a grade of B or higher. Completed the Biostatistics Qualifying Exam at the applicable level, have an overall GPA of 3.0 or higher (be a student in good standing with the UAB Graduate School). Receive an invitation from the applicable faculty member to register for this course.

BST 690. Biostatistical Consulting and Applied Problems. 3 Hours.
Students will work individually to address, analyze and present the results of an applied problem or grant design each week. The presentation of approaches, solutions and designs will be conducted in a round table format. Students will be evaluated on the quality of solution and by their presentation and class participation.
Prerequisites: BST 621 [Min Grade: C] and BST 622 [Min Grade: C]

BST 691. Pre-Doctoral Seminar Series. 1 Hour.
Biostatistics Seminar Series. This course is restricted to Biostatistics in Public Health majors only. This course provides an opportunity for students to learn about ongoing research in the field of biostatistics, clinical trials, and statistical genetics.

BST 695. Special Topics. 1-3 Hour.
Special topics in Biostatistics not covered in regular 600 level courses, but suited for Masters students in Biostatistics and doctoral students in other related disciplines.

BST 698. Non Thesis Research. 1-12 Hour.
Independent non-thesis research with guidance of appropriate faculty. Restricted to Biostatistics Majors only or permission of instructor / department.

BST 703. Methods in Evidence-Based Public Health. 3 Hours.
This course introduces students to the Evidence-Based Public Health (EBPH) framework. The Evidence-Based Public Health framework will be used to collaborate with the Jefferson County Department of Health (JCDH) on; 1) identifying critical public health needs in our local area; 2) suggesting appropriate evidence-based policies and interventions to address these needs; 3) proposing an evaluation plan to assess the impact of the suggested policy or intervention.

BST 723. Theory of Linear Models. 3 Hours.
Multivariate normal distributions and quadratic forms; least square estimation; nested models; weighted least squares, testing contrasts; multiple comparison; polynomial regression; maximum likelihood theory of log linear models will be studied.
Prerequisites: BST 632 [Min Grade: B]

BST 724. Experimental Design. 3 Hours.
This course provides training for the design of experiments in biomedical research. BST 724 extends the intermediate training to delve into more theoretical justification and advanced applications. The course will cover classical experimental designs including factorial and nested (hierarchical) designs, Latin squares, incomplete block designs, fractional factorials, and mixture designs. It will use a matrix approach to analysis. In addition, it will emphasize statistical methodology and communication of procedures, results, and conclusions. BST 724 is intended for advanced graduate students in the Department of Biostatistics who have completed BST 621/622, 623, and 631/632.
Prerequisites: BST 621 [Min Grade: B] and BST 622 [Min Grade: B] and BST 623 [Min Grade: B] and BST 631 [Min Grade: B] and BST 632 [Min Grade: B]

BST 725. Advances Clinical Trails. 3 Hours.
This course will provide students with the tools to develp a basic understanding of the fundamental statistical principles involved in the design and conduct of clinical trials.
Prerequisites: BST 611 [Min Grade: C] and BST 612 [Min Grade: C] or BST 621 [Min Grade: C] and BST 622 [Min Grade: C] and BST 625 [Min Grade: C]

BST 726. Advanced Clinical Trials II. 1 Hour.
This course builds on the knowledge gained in BST 725 in order to develop a more thorough understanding of the basic methodology behind important statistical concepts used in the design and analysis of large, randomized clinical trials. The class will involve discussions of publications dealing with current topics of interest in clinical trials.
Prerequisites: BST 621 [Min Grade: C] and BST 622 [Min Grade: C] and BST 625 [Min Grade: C] and BST 631 [Min Grade: C] and BST 632 [Min Grade: C] and BST 725 [Min Grade: C]

BST 735. Advanced Inference. 4 Hours.
Stochastic convergence and fundamental inequalities; weak convergence and the central limit theorems; large sample behavior of the empirical distribution and order statistics; asymptotic behavior of estimators and tests with particular attention to LR, score and Wald tests.
Prerequisites: BST 631 [Min Grade: B] and BST 632 [Min Grade: B]

BST 740. Bayesian Analysis. 3 Hours.
To introduce the student to the basic principles and tools of Bayesian Statistics and most importantly to Bayesian data analysis techniques. A major goal is to establish a firm foundation in the discipline upon which the applications of statistical and epidemiologic inference will be built.
Prerequisites: BST 632 [Min Grade: C]

BST 741. Advanced Bayesian Analysis II. 3 Hours.
This course is intended to illustrate advanced Bayesian modeling and computation for variety of models and problems.
Prerequisites: BST 631 [Min Grade: B] and BST 632 [Min Grade: B]

BST 750. Stochastic Modeling. 3 Hours.
Poisson processes; random walks; simple diffusion and branching processes; recurrent events; Markov chains in discrete and continuous time; birth and death process; queuing systems; applications to survival and other biomedical models will be studied.
Prerequisites: BST 632 [Min Grade: C]

BST 760. Generalized Linear and Mixed Models. 3 Hours.
Generalized linear models; mixed models; and generalized estimating equations.
Prerequisites: BST 723 [Min Grade: B]

BST 765. Advanced Computational Methods. 3 Hours.
Numerical algorithms useful in biostatistics including likelihood maximization using the Newton-Raphson method, EM algorithm, numerical integration using quadratic and Monte-Carlo methods, interpolation using splines, random variate generation methods, data augmentation algorithm, and MCMC and Metropolis-Hastings algorithm; randomization tests; resampling plans including bootstrap and jackknife will be studied.
Prerequisites: BST 632 [Min Grade: B]

BST 775. Statistical Methods for Genetic Analysis I. 3 Hours.
This course will provide a staistical basis for describing variation in qualitative (disease) and quantitative traits. This will include decomposition of trait variation into components representing genes, environment and gene-environment interaction. Resemblance between relative and heritability will be described. Important topics of discussion will include oligogenic and polygenic traits, complex segregations analysis, methods of mapping and characterizing simple and complex trait loci. NOTE: It is assumed that students are comfortable with regression theory, covariance, correlation, and likelihood theory. Interested students are urged to contact the instructors with concerns regarding assumed knowledge.
Prerequisites: BST 623 [Min Grade: C] and BST 632 [Min Grade: C] and BST 675 [Min Grade: C]

BST 776. Statistical Methods for Genetic Anlaysis II. 3 Hours.
This course builds on the knowledge gained in BST 775 with rigorous mathematical & statistical treatment of methods for localizing genes and environmental effects involved in the etiology of complex trits using case-control and pedigree data. NOTE: Knowledge of SAS and programming languages such as C++, and basic knoledge of multivariate methods and Markov chain theory is highly recommended.
Prerequisites: BST 775 [Min Grade: C]

BST 790. DrPH Applied Practice Experience. 3-6 Hours.
All DrPH students will complete an applied practice experience (Practicum) in which the student will complete at least one project that is meaningful for a public health organization and to advanced public health practice.

BST 793. Post-doc Seminar Series. 3 Hours.
BST seminar series. Permission of instructor / department required.

BST 795. Advanced Special Topics. 1-6 Hour.
This course is designed to cover advanced special topics in Biostatistics that are not covered in regular 700 level courses, but suited for doctoral students in Biostatistics.
Prerequisites: BST 622 [Min Grade: B] and BST 632 [Min Grade: B]

BST 798. Non-Dissertation Research. 1-12 Hour.
Non-dissertation research with the guidance of appropriate faculty. Research conducted before admission to candidacy for the doctoral degree. Biostatistics majors only or permission of instructor / department required.

BST 799. Dissertation Research. 1-12 Hour.
Doctoral Level Dissertation Research under the direction of the dissertation research committee. Reserved for Biostatistics only or permission of instructor /department. Admission to Candidacy required.
Prerequisites: GAC Z

Environmental Health Sciences

Degree Offered:	M.P.H., M.S.P.H., Ph.D.
Chair:	Jeffrey Wickliffe, PhD
Phone:	(205) 934-6080
Website:	www.uab.edu/soph/home/ehs
Department Contact:	Julie Brown, MS, MBA
Department Contact Email:	jebrown@uab.edu

Overview

Environmental Health assesses factors in our environment to understand their role in the health of individuals and populations. This concentration addresses environmental risk factors, such as airborne pollutants, water contaminants, and heat, that pose threats to the health of communities, workers, and vulnerable populations. Additionally, the program evaluates issues in sustainability and population inequalities related to environmental exposures.

Students who study Environmental Health will become knowledgeable in a variety of approaches that are used to assess environmental hazards and the environmental risk to populations.

Degree Programs

- Doctor of Philosophy (PhD) in Environmental Health Sciences
- Master of Public Health (MPH) concentration in Environmental Health - (Including the Fast Track Program, Accelerated Bachelors/Masters (ABM) and Online Degree Program)
- Master of Science in Public Health (MSPH) concentration in Environmental and Occupational Health Sciences
- Master of Science in Public Health (MSPH) concentration in Industrial Hygiene

Admission

Master Program Deadline:	www.uab.edu/soph/home/apply/graduate
PhD Program Deadline:	www.uab.edu/soph/home/apply/graduate
GPA	3.0
Number of Evaluation Forms:	Three
Entrance Tests: GRE	www.uab.edu/soph/home/apply/graduate
TOEFL	TOEFL is required for international applicants whose native language is not English.
SOPH Admissions:	www.uab.edu/soph/home/apply/graduate

UAB has many degree programs (both face-to-face and online) that can lead to professional licensure or certification. Licensure requirements vary from state to state and by professional organization. Federal Regulations require UAB to provide public or general disclosures on educational programs designed to meet educational requirements for a specific professional license or certification, that is required for employment in an occupation, or is advertised as meeting such requirements. For a list of programs that customarily lead to professional licensure or certification, please visit the UAB Professional Licensure and Certification webpage.

Master of Public Health with a Concentration in Environmental Health

Including the MPH Fast Track Program, Accelerated Bachelors/Masters(ABM) and Online Degree Program

The degree of the Master of Public Health (MPH) with a concentration in Environmental Health is intended to prepare students to practice environmental and occupational health, in government agencies, non-profit agencies, and industry. The MPH in Environmental Health focuses on the identification and assessment of human health threats; on the prevention of disease and injury related to environmental and occupational agents; and, on the promotion of health among individuals, communities, and populations.

Curriculum

Students pursuing the MPH degree acquire knowledge of fundamental public health disciplines through the school's core courses. This includes 14 required hours in core courses. In addition, a student will complete the department core courses and specific program track courses and electives as required. Electives are chosen in consultation with the student's academic advisor. Electives outside the SOPH must be approved by the student's advisor.

Requirements		Hours
Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement (1 hour)		
ENH 690	Environmental Health Perspectives	1
Concentration Requirements: (18 hours)		
ENH 600	Fundamentals of Environmental Health Science	3
ENH 612	Assessing & Managing Environmental Risks	3
ENH 615	Environmental Justice and Ethics	3
ENH 650	Essentials of Environmental and Occupational Toxicology and Diseases	3
ENH 660	Fundamentals of Air and Water Pollution	3
ENH 670	Fundamentals of Occupational Safety	3
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Approved Electives (6 hours):		
Select 6 hours of 600-level or higher courses		6

Integrative Learning Experience (2 hours):		
ENH 689	Environmental Health Sciences Integrative Learning Experience	2
Total Hours		**44**

Master of Science in Public Health with a Concentration in Environmental and Occupational Health Sciences

The Master of Science in Public Health (MSPH) with a concentration in Environmental and Occupational Health Sciences provides an intensive educational and research experience. This degree prepares students for applying to doctoral programs, or for employment in research, government, and industry. Although MSPH students may go on to practice public health, MSPH students have more of an interest in research. MSPH students learn to understand how environmental pollutants affect the health of populations, and learn specific approaches for assessing, preventing, and controlling environmental hazards., Students are required to develop an interest area in environmental or occupational health and then conduct research that leads to developing a thesis. Since students in the MSPH degree write a thesis, they are learning to communicate scientific findings.

Curriculum

In addition to the MSPH core courses and school-wide requirements, students take 20-21 hours of Environmental & Occupational Health Sciences courses and approved elective courses, 3 hours of directed research and 6 hours of project research for a total of 44-45 credit hours. Students in the MSPH program are required to do a masters' thesis.

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

Requirements		Hours
MSPH Core Requirements: (12 hours)		
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
ENH 600	Fundamentals of Environmental Health Science	3
EPI 610	Principles of Epidemiologic Research	3
School-Wide Requirements: (3 hours)		
GRD 717	Principles of Scientific Integrity	3
Concentration Requirements: (12 hours)		
ENH 612	Assessing & Managing Environmental Risks	3
ENH 650	Essentials of Environmental and Occupational Toxicology and Diseases	3
ENH 660	Fundamentals of Air and Water Pollution	3
ENH 661L	Environmental Sampling and Analysis Laboratory	3
Concentration Select ENH Courses: (2 - 3 hours)		
EPI 616	Environmental Epidemiology	3
ENH 611	Environmental & Occupational Exposure Assessment	3
ENH 626	Physical Agents	2
Concentration Select ENH Courses: (3 hours)		
ENH 621	Fundamentals of Industrial Hygiene	3
ENH 670	Fundamentals of Occupational Safety	3
Approved Electives: (3 hours)		
Select 3 hours of 600-level or higher courses		3
Master's Directed Research: (Minimum of 3 credit hours)		
ENH 698	Masters Directed Research	1-9
Master's Project Research: (Minimum of 6 hours once admitted to candidacy)		
ENH 699	Masters Level Project Research	1-9
Total Hours		**46-62**

The Master of Science in Public Health with a Concentration in Industrial Hygiene

The Master of Science Public Health with a concentration in Industrial Hygiene will provide students with an option to focus on industrial hygiene topics and provide a dedicated research experience. Industrial hygiene professionals must be able to recognize, evaluate, and control occupational situations that may lead to disease or injuries. They may also require expertise in designing and conducting studies of occupational sites to assess the probability that exposures present a risk to workers, to define safe limits for human exposures and set in place control measures. The research aspect of this curriculum is conducted under the requirements of the UAB Graduate School, and includes formation of a research committee, defense of a research proposal, conducting the research under adviser supervision, preparation of a formal thesis, and presentation and defense of the thesis. The industrial hygiene program is part of the Deep South Center for Occupational Health and Safety, one of 18 Education and Research Centers supported by the National Institute for Occupational Safety and Health (NIOSH).

Curriculum

Students must complete a minimum of 43 credit hours, including MSPH core courses, industrial hygiene concentration courses, and research. If a student is receiving NIOSH funding they will also be required to complete an internship so the number of hours will be a minimum of 46 hours. Students in the MSPH program are required to write and submit a master's thesis.

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

Requirements		Hours
MSPH Core Requirements: (6 hours)		
BST 611	Intermediate Statistical Analysis I	3
EPI 610	Principles of Epidemiologic Research	3
School-Wide Requirements: (3 hours)		
GRD 717	Principles of Scientific Integrity	3
Department Track Requirements: (6 hours)		
ENH 650	Essentials of Environmental and Occupational Toxicology and Diseases	3

ENH 661L	Environmental Sampling and Analysis Laboratory	3
Concentration Requirements: (15 hours)		
ENH 621	Fundamentals of Industrial Hygiene	3
ENH 624	Control of Occupational Hazards	2
ENH 625	Industrial Hygiene Case Studies	2
ENH 626	Physical Agents	2
ENH 670	Fundamentals of Occupational Safety	3
ENH 680	Interdisciplinary Field Studies	1
ENH 681	Interdisciplinary Worksite Evaluations	2
Concentration Select ENH Courses: (Minimum 3 hours)		
ENH 600	Fundamentals of Environmental Health Science [1]	3
or ENH 660	Fundamentals of Air and Water Pollution	
or BST 612	Intermediate Statistical Analysis II	
Masters Directed Research: (Minimum 4 hours)		**4**
ENH 698	Masters Directed Research	
Masters Project Research: (Minimum of 6 hours once admitted to candidacy)		**6**
ENH 699	Masters Level Project Research	
Total Hours		**43**

[1] Students can select ENH 600 if they do not have a background in Environmental Health Sciences.

Doctor of Philosophy in Environmental Health Sciences

The PhD in Environmental Health Sciences is an academic research degree. The doctoral program prepares scientists for careers in research, environmental program management, risk assessment and policy. Didactic training and research in the identification, evaluation, and control of occupational and environmental hazards to human health are emphasized in this program. Students may concentrate on a wide variety of areas including exposure assessment, toxicology, environmental chemistry, air and water pollution, risk assessment and management. In addition to understanding the advanced concepts of environmental health sciences, graduates of this program are expected to develop skills that will enable them to identify and define questions of environmental health importance, design research studies to address these questions, and to complete a program of research that demonstrates abilities as an independent investigator. Graduates are qualified to assume upper-level positions in the public or private sector in research, management, teaching, or consulting.

Curriculum

PhD students are expected to complete departmental required courses, electives and research. Other courses preparatory to dissertation research will be determined by the academic advisor or dissertation committee in consultation with the student.

Students who are admitted to the PhD program with a relevant master's degree will be required to complete a minimum of 72 hours. Students without a relevant master's degree will be required complete a minimum of 78 hours. The admissions committee will decide which schedule the student is required to follow. These are the minimum number of required hours; additional coursework that the dissertation committee deems necessary, or additional research hours needed to complete the dissertation may increase the total number of credit hours.

All students in an MSPH, MS, DrPH, or PhD program are required to complete **PUH 600: Overview of Public Health**. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

PhD curriculum for students with a relevant masters degree.

Requirements		Hours
School Core Requirement		
BST 612	Intermediate Statistical Analysis II	3
ENH 700	Scientific Basis of Environmental Health	3
EPI 616	Environmental Epidemiology	3
GRD 717	Principles of Scientific Integrity	3
PUH 703	Public Health Grant Writing	3
or GRD 704	Specialized Instruction	
or GRD 723	Writing Research for Academic Audiences	
Department Core Requirement		
Select two of the following: ENH 611, ENH 660 and/or ENH 661L		6
ENH 611	Environmental & Occupational Exposure Assessment	
ENH 660	Fundamentals of Air and Water Pollution	
ENH 661L	Environmental Sampling and Analysis Laboratory	
ENH 790	Seminar: Current Topics in ENH Sciences Research	1
ENH 790	Seminar: Current Topics in ENH Sciences Research	1
Electives		
Selected through discussion between advisor, committee, and student; courses could be outside SOPH		13
Directed Research [1]		**12**
ENH 798	Doctoral Level Directed Res	
Dissertation Research [2]		**24**
ENH 799	Dissertation Research	
Total Hours		**72**

[1] Directed Research requires a minimum of 12 credit hours

[2] Dissertation Research requires a minimum of 24 hours with at least two semesters of candidacy

PhD curriculum for students without a masters degree or relevant masters degree.

Requirements		Hours
Required for Students without Masters		
BST 611	Intermediate Statistical Analysis I	3
EPI 610	Principles of Epidemiologic Research	3
School Core Requirement		
BST 612	Intermediate Statistical Analysis II	3
ENH 700	Scientific Basis of Environmental Health	3
EPI 616	Environmental Epidemiology	3
GRD 717	Principles of Scientific Integrity	3
PUH 703	Public Health Grant Writing	3
or GRD 704	Specialized Instruction	
or GRD 723	Writing Research for Academic Audiences	
Department Core Requirement		
Select two of the following: ENH 611, ENH 660 and/or ENH 661L		6

ENH 611	Environmental & Occupational Exposure Assessment	
ENH 660	Fundamentals of Air and Water Pollution	
ENH 661L	Environmental Sampling and Analysis Laboratory	
ENH 790	Seminar: Current Topics in ENH Sciences Research	1
ENH 790	Seminar: Current Topics in ENH Sciences Research	1
Electives		
Selected through discussion between advisor, committee, and student; courses could be outside SOPH		13
Directed Research [1]		**12**
ENH 798	Doctoral Level Directed Res [2]	
Dissertation Research [3]		**24**
ENH 799	Dissertation Research [3]	
Total Hours		**78**

1 Directed Research requires a minimum of 12 credit hours
2 ENH 798 requires a minimum of 7 hours
3 ENH 799 requires a minimum of 24 credit hours; Dissertation Research requires at least two semesters of candidacy

Courses

ENH 600. Fundamentals of Environmental Health Science. 3 Hours.
We live inextricably with our surroundings, including both the natural and built environments. And in these surroundings both natural and man-made components can impact how we live because they impact our health and our safety. This course will critically examine major factors found around us in our everyday lives and investigate how human health is impacted. Regulatory controls, risk, and preparedness will be discussed with respect to decreasing the negative environmental impacts on public health.Prerequisite: Admission into an MPH program, School of Public Health or special permission from the course director.

ENH 605. Remote Sensing and Public Hlth. 3 Hours.
Observing global patterns via satellites can help with research endeavors, this course will focus on the applications of remote sensing to both health and the social sciences. Hands on experience using satellite remote sensing will enrich the experience. This course will give students the chance to learn about a wide rande of remote sensing applications in both classrooms and lab settings. The course will progress from basic remote sensing analysis techniques to the point where the students are responsible for their own research projects.

ENH 610. Environmental Disasters. 3 Hours.
Examines the worldwide problem of toxic disasters, particularly those involving invisible agents (chemicals, infectious disease agents, radiation). Theory, case studies, field experience, and current scientific research are reviewed, and the public health, environmental, human services and public policy implications of toxic disasters are discussed.

ENH 611. Environmental & Occupational Exposure Assessment. 3 Hours.
This course is intended to develop an understanding and appreciation of environmental exposure assessment and its role in providing the tools and information for toxicology, epidemiology, and risk management. The course material introduces the general concepts of first recognizing environmental exposures to chemicals in human populations, and then using sampling techniques to assess exposures. This is a designated service learning course.

ENH 612. Assessing & Managing Environmental Risks. 3 Hours.
The purpose of this course is to provide students with an overview of environmental policy, with a focus on demonstrating how toxicology and exposure measurements are used in environmental risk assessment and management. Students are presented with the basic elements of a quantitative risk assessment including hazard identification, exposure assessment, dose-response assessment, and risk characterization. This course is designed to instill critical thinking regarding the often conflicting economic, social, and environmental tradeoffs inherent in environmental policy and management.
Prerequisites: ENH 650 [Min Grade: C](Can be taken Concurrently) or ENH 650Q [Min Grade: C]

ENH 615. Environmental Justice and Ethics. 3 Hours.
This course will critically examine one of the fastest growing social movements in the United States, the movement for environmental justice, and will explore the relationships among environmentalism and ethics. We will discuss the ethical considerations underlying the placement of hazardous waste sites and toxic industries in poor communities and communities of color, as well as the economic and social issues that resulted from these actions. The course will also focus on Native American communities in the west, colonialism and global justice/human rights.

ENH 617. Sustainability and Public Health. 3 Hours.
Starting from a foundation of sustainability framed by the UN sustainable development goals, this course examines placed-based examples of successes and challenges in sustainability and public health. Students will critically evaluate the intersecting factors contributing to and scientific/policy evidence underpinning socially, environmentally, and economically unsustainable elements of our local community, and how these situations impact human health and well-being. Particular areas of emphasis include the built environment, transportation, waste, food, supply chain, energy, and climate change. Course presentation will include lectures, readings, field experiences, community engagement, and videos/film.

ENH 621. Fundamentals of Industrial Hygiene. 3 Hours.
Chemical, physical and other hazards and stresses found in the work environment. Recognizing potential hazards by understanding industrial processes, toxicity of environmental contaminants and occupational disease processes. Study design and preparation for field evaluation, conduct of industrial hygiene surveys, and interpretation of survey results.

ENH 624. Control of Occupational Hazards. 2 Hours.
Importance of engineering controls in reducing occupational health hazards. Substitution of less toxic substances, modification of work processes, and design of local exhaust ventilation systems; proper selections and use of personal protective equipment, especially respirators, also considered.

ENH 625. Industrial Hygiene Case Studies. 2 Hours.
Integrates students' basic knowledge through consideration of real work-place situations. Step-by-Step analysis of case reports covering occupational health problems in representative industrial situations. Sequential presentation of overview of working conditions, survey strategies, interpretation of results, and recommendations.

ENH 626. Physical Agents. 2 Hours.
Sources, effects, and control of occupational and environmental noise, ionizing and non-ionizing radiation, and temperature extremes. Review of exposure standards and introduction of measurement equipment and techniques.

ENH 635. Foodborne and Waterborne Diseases: Causes and Prevention. 3 Hours.
This course provides a broad overview of the major foodborne and waterborne diseases. The course describes how information from surveillance is used to improve public health policy and practice in ways that contribute to the safety of our food and water. We focus on the pathogens responsible for food- and water-transmitted diseases, discussing the diseases they cause, their prevalence and relevance to public health in developed and developing nations; disease pathogenesis and clinical manifestations; reservoirs, modes of transmission, and strategies for detection and prevention.

ENH 650. Essentials of Environmental and Occupational Toxicology and Diseases. 3 Hours.
Serves as introductory graduate level course that focuses on multiple aspects of toxicology and disease processes associated with environmental and occupational exposures. Students learn basic terminology and concepts of environmental and occupational toxicology as well as occupational and environmental disease recognition, management and prevention. Emphasis is on scientific foundations rather than on addressing topical issues. The general course orientation is towards basic principles, organ system physiology, diseases and prevention. This is a designated service learning course.

ENH 660. Fundamentals of Air and Water Pollution. 3 Hours.
The course is an integrated introduction to air and water pollution, including its sources, transport and effects. The course focuses on the measurement and characterization of air pollutants and the assessment of water quality. Emphasis will also be given to the regulatory control of pollutants and to the technical aspects of engineering controls. The potential impact of air pollutants on the climate change will also be emphasized.

ENH 661L. Environmental Sampling and Analysis Laboratory. 3 Hours.
This course is designed to provide the students with a thorough understanding of the principles and practice of air and water sampling and familiarize them with the analytical methods used for air and water pollutant analysis. The course will focus on contaminant gases, vapors, suspended particulate material and dissolved chemicals in water. A basic understanding of chemistry and physics is a prerequisite.

ENH 670. Fundamentals of Occupational Safety. 3 Hours.
Basic principles of safety and loss control; emphasis on prevention of losses of people, property, and products in the work place. Developing competence in human-factors engineering, fire prevention, physical and behavioral science, product safety, and science of accident prevention.

ENH 680. Interdisciplinary Field Studies. 1 Hour.
In this course, students will be organized into interdisciplinary teams to include at least one representative of each occupational safety and health academic discipline and participate in team building activities to facilitate group interactions for the interdisciplinary course ENH 681 in the spring. Students will be exposed to basic concepts of occupational hygiene, learn to recognize different types of hazards (i.e. chemical, biological, physical agents) in the workplace and their health outcomes, conduct a walkthrough survey of an occupational setting, attend OHS seminars and meetings, work collaboratively with other OHS students and professionals on projects, and learn how collaborations with other health professionals with complementary skills can help them achieve a comprehensive occupational health and safety goal. Students enrolled in this course must be admitted to one of the academic programs of the Deep South Education and Research Center. This class is a requirement for all NIOSH trainees.

ENH 681. Interdisciplinary Worksite Evaluations. 2 Hours.
To assist students in developing critical thinking and analytical skills, provide them with experience in applying discipline-specific knowledge in a broad occupational health and safety context, and provide experience in working in interdisciplinary teams. The course consists of an overview of survey methodology and information sources, with emphasis on job safety analysis, a review of the occupational site or process to be evaluated and a report of the identified hazards and recommended controls.
Prerequisites: ENH 680 [Min Grade: C](Can be taken Concurrently) or ENH 680Q [Min Grade: C]

ENH 689. Environmental Health Sciences Integrative Learning Experience. 2 Hours.
The ENH ILE or capstone course represents a culminating experience that allows students to demonstrate synthesis of foundational and concentration competencies. This course will provide students with the opportunity to use skills gained during your MPH program to assess different aspects of a community's assets, environment, or health. This course will offer insights on current research and practice, how policies influence health and allow students to identify root causes of public health issues. All MPH students must complete this capstone course to graduate during the final term of enrollment.
Prerequisites: PUH 688 [Min Grade: C]

ENH 690. Environmental Health Perspectives. 1 Hour.
ENH 690 represents a broad overview of Environmental Health from a variety of perspectives. All MPH students in the SOPH, regardless of departmental or program affiliation, must complete this course to graduate. This course provides all MPH students the opportunity to consider how the various disciplines in public health intersect with environmental health. The course will offer insights on current research and practice, how policies influence health, and give students the opportunity to identify root causes of public health issues within the context of environmental health.
Prerequisites: PUH 601 [Min Grade: C] and PUH 602 [Min Grade: C] and PUH 603 [Min Grade: C] and PUH 604 [Min Grade: C] and PUH 605 [Min Grade: C] and PUH 606 [Min Grade: C]

ENH 691. Current Topics in Environmental Health and Occupational Health and Safety. 1-3 Hour.
Development of communication skills through objectively reviewing scientific literature; presentations and summaries of research or professional activities.

ENH 695. Seminar on Selected Environmental Health Topics. 1-9 Hour.
This course will be used as faculty design and craft course topics based on specific interests. These courses will be taught on a masters level.

ENH 697. Internship. 3 Hours.
The internship provides an opportunity for each student to work in a public health setting in a position that carries responsibility and is of particular interest. In order to register for the internship course, students must have completed all public health core coursework. Usually, this means that students must wait until their 3rd semester to complete the internship. Students must complete a minimum of 180 contact hours with the organization during the semester in which they register for the internship.
Prerequisites: (BST 601 [Min Grade: C] or BST 601Q [Min Grade: C] or PUH 601 [Min Grade: C]) and (ENH 600 [Min Grade: C] or ENH 600Q [Min Grade: C] or PUH 602 [Min Grade: C]) and (EPI 600 [Min Grade: C] or EPI 600Q [Min Grade: C] or PUH 603 [Min Grade: C]) and (HB 600 [Min Grade: C] or HB 600Q [Min Grade: C] or PUH 604 [Min Grade: C]) and (HCO 600 [Min Grade: C] or (PUH 605 [Min Grade: C] and PUH 606 [Min Grade: C]) or HCO 600Q [Min Grade: C])

ENH 698. Masters Directed Research. 1-9 Hour.
Independent study with guidance of appropriate faculty.

ENH 699. Masters Level Project Research. 1-9 Hour.
Research for project under direction of research project committee.
Prerequisites: GAC M

ENH 700. Scientific Basis of Environmental Health. 3 Hours.
This is an overview course that is intended to provide doctoral students with a broad understanding of the scientific principles on which environmental health is based within the context of the interaction of human activities and ecosystems, and the reciprocal impact of those interactions on human health and global ecology.

ENH 701. Advanced Environmental Chemistry. 3 Hours.
The course will describe the underlying physicochemical and mathematical formulations governing environmental physico-chemical processes including the coupling with biological media. Specific attention will be paid in understanding the physical basis of the processes and critical variables rather than memorizing the mathematical equations. The kinetics and thermodynamics of chemical transformations including redox and photolysis reactions will be introduced. Subsequently, specific environmental cases involving aquatic and atmospheric environments will be thorough investigated. Students are strongly recommended to have: (1) understanding of organic chemistry and basic thermodynamics; (2) comfort with math.

ENH 705. Special Topics in Environmental and Occupational Health Occupational Hygiene Research - Journal Club. 1-9 Hour.
This course is designed to provide advanced (doctoral) students in Environmental Health Sciences in general, and Industrial hygiene in particular an overview of the research literature and introduction in advance topics such as nanomaterials, control banding, quantitative occupational exposure assessment, etc. Students will have the opportunity to present their own research, learn about the research conducted by their peers and conduct critical review of published research.

ENH 752. Biochemical and Molecular Toxicology. 3 Hours.
This advanced course serves to equip students to understand at the molecular and cellular levels how environmental and occupational agents exert their toxic properties against specific genetic backgrounds. This course assumes a strong foundational knowledge of cell biology, RNA and DNA metabolism, and gene function, structure and regulation. This course will prepare students to apply advanced toxicology principles to agents of disease in order to understand the molecular mechanism and where interventions may be appropriate. Prerequisite: Admission into a public health or biomedical PhD program or permission of the instructor.

ENH 763. Aerosol Technology. 3 Hours.
Defines properties and behavior of aerosols from industrial hygiene and environmental perspectives. Reviews fundamental particle descriptions and critical fluid properties affecting particle behavior. Methods of defining particle size and particle behavior. Methods of defining particle size and size distribution and theories of particle kinetics and their application to particle disposition and collection This multidisciplinary course covers the fundamental principles that govern the formation, growth, measurement and modeling of particles behavior (both ambient and nanoparticles) with direct application to health sciences and engineering specialties. The course explores the quantitative evaluation of aerosol behavior including the physical and chemical parameters that govern it. Specific applications of atmospheric and occupational aerosol, bioaerosol and nanoparticles are included to link fundamental knowledge to practical implications in industrial hygiene, national security and materials technology.

ENH 770. Advanced Topics in Environmental Disasters in PUH. 3 Hours.
Examines emerging public health challenges posed by incidents involving chemicals, radiation and biological agents. Students are provided with the opportunity to undertake guided research on current topics in the field and discuss their findings with graduate students and faculty members. Course will be graded by letter. Prerequisites: ENH 610 [Min Grade: C] NOTE: If course prerequisite of ENH 610 is not met, permission of instructor is required.
Prerequisites: ENH 610 [Min Grade: C](Can be taken Concurrently)

ENH 781. Journal Club. 1 Hour.
The purpose of this course is to provide a forum in which students become comfortable critically reviewing recent refereed publications in the fields of environmental health, toxicology, occupational health, and industrial hygiene. Students will also be expected to become comfortable answering and asking questions in a scientific setting.

ENH 790. Seminar: Current Topics in ENH Sciences Research. 1 Hour.
Interactive forum in which graduate students and faculty discuss dissertation research projects and topics related to the field of Environmental Health Sciences Research through presentation of journal articles. Course is designed to develop oral communication skills for presenting scientific material to peer groups. Presentations by graduate students are followed by discussion and questions. Preq: Permission of instructor required.

ENH 796. Environmental Toxicology Laboratory Rotations. 3 Hours.
Doctoral laboratory rotations in Environmental Health Sciences. Required for First and Second year PhD students in the Industrial Hygiene and Environmental Management and Policy foci. Preq: Permission of instructor required.

ENH 798. Doctoral Level Directed Res. 1-9 Hour.
Independent study with guidance of appropriate faculty.

ENH 799. Dissertation Research. 1-9 Hour.
Research for dissertation under the direction of the dissertation committee. Preq: Must be admitted to candidacy before registering for this course.
Prerequisites: GAC Z

Epidemiology

Degree Offered:	M.P.H, M.S.P.H., Ph.D.
Chair:	Cora E. Lewis, MD, MSPH
Phone:	(205) 975-7699

Website:	www.uab.edu/soph/home/departments/epidemiology
Department Student Contact:	Kimberly Hawkins King
Department Student Contact E-mail:	hawkinsk@uab.edu

Overview

Epidemiology is the study of trends, patterns, and causes related to disease in populations. Students who concentrate in epidemiology are interested in how diseases spread among given populations. Epidemiologists create complex analytical models to help us understand the causes of and solutions to these diseases more clearly.

Graduates of the UAB Epidemiology program have found employment in academia, research organizations and foundations, industry, public and private health services delivery organizations, and international agencies. Many of our doctoral graduates have faculty positions.

Degree Programs

- Master of Public Health (MPH) concentration in Epidemiology (Including the Fast Track Program, Accelerated Bachelors/Masters (ABM) and Online Degree Program)
- Master of Science in Public Health (MSPH) concentration in Applied Epidemiology
- Doctor of Philosophy (PhD) in Epidemiology

Admission Requirements

Applicants must meet the requirements for admission to the UAB School of Public Health and must demonstrate their aptitude for biological sciences and mathematics by virtue of their college transcripts and GRE scores.

Entry Term	Deadline
Master Program Deadline:	www.uab.edu/soph/home/apply/graduate
PhD Program Deadline:	May 15 (U.S.); April 1 (International); Deadline to apply for funding consideration is January 10
GPA:	3.0
Number of Letters of Recommendation Required:	Three
Entrance Tests: GRE	www.uab.edu/soph/home/apply/graduate
TOEFL:	TOEFL is required for international applicants whose native language is not English.
SOPH Admissions:	www.uab.edu/soph/home/apply/graduate

UAB has many degree programs (both face-to-face and online) that can lead to professional licensure or certification. Licensure requirements vary from state to state and by professional organization. Federal Regulations require UAB to provide public or general disclosures on educational programs designed to meet educational requirements for a specific professional license or certification, that is required for employment in an occupation, or is advertised as meeting such requirements. For a list of programs that customarily lead to professional licensure or certification, please visit the UAB Professional Licensure and Certification webpage.

Master of Public Health with a Concentration in Epidemiology

Including the Fast Track Program, Accelerated Bachelors/Masters (ABM) and Online Degree Program

This MPH in Epidemiology program is intended for persons who anticipate careers in public health practice. In addition, students who wish to enter doctoral-level training should consider majoring in epidemiology at the master's level. Graduates of the MPH in Epidemiology may assume faculty or research positions in academia or management positions in government or industry if they have other professional degrees (e.g., MD, DDS) as well. Graduates of the program without professional credentials generally assume mid-level positions in academia, industry or government. The MPH in Epidemiology in-person program typically takes 4 semesters or 16 months of full-time coursework to complete. Part-time coursework generally takes students at least 6-8 semesters to complete.

Curriculum

For full-time students in our MPH program, and for those students who opt to complete our accelerated graduation plan, all core courses can be completed within the first two semesters of enrollment except for EPI 689: Integrative Experience, which MUST be taken in the last semester of enrollment or graduation term (with the exception of graduation in the Summer term, when students would register for EPI 689 in the Spring term).

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Concentration Requirements: (14 hours)		
EPI 610	Principles of Epidemiologic Research	3
EPI 624	Introduction to Data Analysis with SAS	2
EPI 625	Quantitative Methods in Epidemiology	3
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
EPI Required Electives: (3 hours - choose one of the following)		**3**

EPI 602	Epidemiology of Chronic Diseases	
EPI 605	Epidemiology of Infectious Diseases	
Approved Electives: (6 hours)		**6**
EPI 603	Injury-Epidemiologic Principles and Prevention Strategies	
EPI 607	Fundamentals of Clinical Research	
EPI 609	Introduction to Pharmacoepidemiology and Drug Safety	
EPI 614	Epidemiologic Methods Applied to Comparative Effectiveness Research	
EPI 616	Environmental Epidemiology	
EPI 619	Infection Prevention and Hospital Epidemiology	
EPI 621	HIV/AIDS and STDs	
EPI 627	Data Analysis and Presentation of Epidemiologic Studies	
EPI 635	Genetics in Public Health	
EPI 690	Population and Health Outcomes Research Seminar Series	
EPI 695	Epidemiology Seminar	
EPI 698	Master's Level Directed Research Epidemiology	
BST 626	Data Management and Reporting with SAS	
Integrative Learning Experience: (3 hours)		
EPI 689	Epidemiology Integrative Learning Experience	3
Total Credit Hours:		**44**

Master of Science in Public Health with a Concentration in Applied Epidemiology

The MSPH with a concentration in Applied Epidemiology program is an academic research degree designed for students who wish to receive education and training in epidemiologic research methods. Completion of didactic course work and a thesis research project and final defense are required. This degree can be completed in as little as 4 semesters or 16 months of full-time course work.

Curriculum

A total of 42 credit hours must be earned to receive the MSPH in Applied Epidemiology degree. Of these 42 total hours, 14 hours are taken to complete the core and school-wide requirements. Students complete 3 semester hours of masters directed research (EPI 698) and 6 hours of masters project research (EPI 699 - after admission to candidacy). Students must consult with their academic advisor for approval of track-specific relevant elective credits. During the last term of enrollment or final graduation term, the student is required to complete his/her final thesis project defense and presentation. A final publishable paper is required for graduation.

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

Requirements		Hours
MSPH Core Requirements: (11 hours)		
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
EPI 610	Principles of Epidemiologic Research	3
EPI 624	Introduction to Data Analysis with SAS	2
School-Wide Requirement: (3 hours)		
GRD 717	Principles of Scientific Integrity	3
Concentration Requirements: (6 hours)		
EPI 625	Quantitative Methods in Epidemiology	3
EPI 627	Data Analysis and Presentation of Epidemiologic Studies	3
EPI Required Elective: (3 hours- choose one of the following)		
EPI 602	Epidemiology of Chronic Diseases	3
EPI 605	Epidemiology of Infectious Diseases	3
Approved Electives: (10 hours)		
BST 625	Design/Conduct Clinical Trials	3
EPI 603	Injury-Epidemiologic Principles and Prevention Strategies	3
EPI 607	Fundamentals of Clinical Research	3
EPI 609	Introduction to Pharmacoepidemiology and Drug Safety	3
EPI 614	Epidemiologic Methods Applied to Comparative Effectiveness Research	3
EPI 616	Environmental Epidemiology	3
EPI 619	Infection Prevention and Hospital Epidemiology	3
EPI 621	HIV/AIDS and STDs	3
EPI 635	Genetics in Public Health	2
EPI 690	Population and Health Outcomes Research Seminar Series	1
EPI 695	Epidemiology Seminar	1
Masters Directed Research: (Minimum 3 credit hours)		
EPI 698	Master's Level Directed Research Epidemiology	1-9
Masters Project Research: (Minimum 6 credit hours)		
EPI 699	Master's Level Project Research Epidemiology	1-9
Total Credit Hours:		**42**

[1] EPI 699 Masters Level Project Research must be taken after admission to candidacy.

Doctor of Philosophy in Epidemiology

The PhD in Epidemiology emphasizes epidemiologic study design and data analysis. The program is designed to prepare exceptionally qualified individuals for a career of research and teaching. Admission is competitive. Applicants should have earned a Master of Public Health (MPH), Master of Science in Public Health (MSPH), Master of Science (MS) degree or equivalent, with a strong background in epidemiology and statistics. Students who complete the degree will master the skills required for conducting independent research in epidemiology, with a firm background in epidemiology, biostatistics, and information management. Specific areas of concentration include chronic diseases, infectious diseases, molecular epidemiology, and injury epidemiologic methods. Further details about the PhD-EPI program may be obtained by contacting the Program Director, Dr. Marguerite Ryan Irvin at **irvinr@uab.edu**. You may also contact the Coordinator of Graduate Academic Programs, Kimberly Hawkins King at **hawkinsk@uab.edu**, or (205) 975-9749. For funding questions regarding our PhD program, please contact Dr. Marguerite Ryan Irvin or the program assistant Kate Sreenan at **ksreenan@uab.edu** or by calling (205) 934-7184.

Curriculum

To earn the PhD degree in Epidemiology students must complete a minimum of 60 total credit hours of academic course work. Of this 60 credit hour minimum, 18 semester hours are required and include

Biostatistics and Epidemiology courses. 27 semester hours must be earned in doctoral level didactic Epidemiology courses and/or advanced Biostatistics courses. GRD 717 Principles of Scientific Integrity is also a required course that students take in the program. Students must also complete at least 12 semester hours of directed research (EPI 798) and 12 semester hours of dissertation research (EPI 799). Additionally, students must complete at least two semesters in candidacy (of EPI 799) before being allowed to graduate.

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

Requirements		Hours
Departmental Requirements: (21 hours)		
BST 621	Statistical Methods I	3
BST 622	Statistical Methods II	3
EPI 704	Advanced Epidemiologic Methods	3
EPI 710	Analysis of Case Control Studies	3
EPI 720	Analysis of Follow-Up Studies	3
GRD 717	Principles of Scientific Integrity	3
PUH 703	Public Health Grant Writing	3
At least one additional doctoral-level Epidemiology course - Select from the following:		
EPI 706	The Epidemiology of Cardiovascular Disease	2
EPI 713	Cancer Epidemiology and Control	3
EPI 721	HIV/AIDS and STDs	3
EPI 781	Special Topics in Epidemiology Research	3
EPI 795	Epidemiology Seminar	1
At least two advanced level Biostatistics courses: [1]		
BST 623	General Linear Models	3
BST 640	Nonparametric Methods	3
BST 655	Categorical Data Analysis	3
BST 660	Applied Multivariate Analysis	3
BST 661	Structural Equation Modelling	3
BST 665	Survival Analysis	3
BST 670	Sampling Methods	3
BST 671	Meta-Analysis	3
BST 723	Theory of Linear Models	3
BST 735	Advanced Inference	4
BST 740	Bayesian Analysis	3
BST 750	Stochastic Modeling	3
BST 760	Generalized Linear and Mixed Models	3
Area Course: At least one (1) preferred 700 level course in an area of medicine or in one of the major areas of PH other than EPI and BST must be taken. The following courses are acceptable. Other courses are available (check course catalog). Please consult with your advisor and PhD program director for approval and any additional recommended courses.		
HPO Courses		
ENH Courses		
HB Courses		
PATH Courses		
GBS or GBSC Courses		
Other approved 700 level relevant doctoral courses		
Doctoral Seminars: (4 hours) [2]		**4**
EPI 790	Doctoral Seminar in Epidemiology (Spring Term Topic: Scientific Writing)	2
EPI 790	Doctoral Seminar in Epidemiology (Summer Term Topic: Manuscript and Grant Reviews)	2
EPI Directed Research: (Minimum 12 credit hours)		
EPI 798	Doctoral Level Directed Research Epidemiology [3]	12
EPI Dissertation Research: (Minimum 12 credit hours)		
EPI 799	Dissertation Research [4]	12
Minimum Credit Hours:		**60**

1 Other courses may be available in Biostatistics, with your advisor's approval. Please check the course catalog.
2 Must be taken at least twice (2 times)
3 EPI 798: Doctoral-Level Directed Research - Register prior to admission to candidacy; Must have at least 12 hours.
4 EPI 799: Dissertation Research - Register after admission to candidacy; Must have at least 12 hours and at least 2 semesters.

Courses

EPI 600. Introduction to Epidemiology. 3 Hours.
EPI 600 is an introductory course designed to teach graduate level public health students the basic principles, methods, and applications of epidemiology. This course is a CORE requirement for non-Epidemiology MPH majors.

EPI 602. Epidemiology of Chronic Diseases. 3 Hours.
This course will explore the breadth and depth of the epidemiology of chronic diseases including classification, surveillance, frequency, distribution, etiology, natural history, risk factors, and control. It will address details of large-scale epidemiologic studies in cardiovascular diseases and cancer, and will discuss epidemiologic papers relating to the use of various study designs. The course will be presented in three modules: (1) Overview, Risk Factors and Control of Chronic Diseases; (2) Epidemiology of Cardiovascular Diseases; (3) Epidemiology of Cancer; and Other Chronic Diseases. Besides the course master, guest lecturers will participate in teaching the course.
Prerequisites: EPI 610 [Min Grade: C] or EPI 610Q [Min Grade: C]

EPI 603. Injury-Epidemiologic Principles and Prevention Strategies. 3 Hours.
Concepts and methods of epidemiology applied to injury; epidemiology of major injury types, utilization of injury data sets; development and evaluation techniques of preventive strategies. EPI 600 or EPI 610 is a recommended prerequisite but is not required.

EPI 605. Epidemiology of Infectious Diseases. 3 Hours.
The course provides an introduction to basic principles of infectious disease epidemiology, surveillance, and control. Time is also dedicated to critical analysis of the magnitude, distribution, risk factors, and public health significance of selected infectious diseases in community and institutional settings. While the primary geographic focus is the U.S., international comparisons and perspectives are included. The course focuses on the major infectious diseases affecting developing nations and on diseases of major current interest. The course also provides an overview of vaccinology principles, current immunization strategies, their public health rationale, and use of vaccines in disease control and eradication.
Prerequisites: EPI 610 [Min Grade: C]

EPI 607. Fundamentals of Clinical Research. 3 Hours.
This course will provide an overview of principles and practices related to the study of determinants and outcomes of medical interventions. Methods for conducting epidemiologic research in the "clinic", assessing the validity of diagnostic and screening tests, measuring therapeutic efficacy and safety, and describing the natural history of disease will be reviewed. EPI 600 or EPI 610 is a recommended prerequisite but not required.

EPI 609. Introduction to Pharmacoepidemiology and Drug Safety. 3 Hours.
The purpose of the course is to 1) introduce to students the emerging field of pharmacoepidemiology (PE) and comparative effectiveness research (CER); 2) to have an overview of the shared and unique methodological issues that commonly and negatively affects the validity and interpretation of PE and CER research; and 3) to introduce methods in study design and data analysis to address such issues. The course is a requirement for the MSPH Pharmacoepidemiology and Comparative Effectiveness Research track. NOTE: Introductory training in epidemiology (EPI 610 or BST 611) is recommended but not required.

EPI 610. Principles of Epidemiologic Research. 3 Hours.
Concepts, philosophy, and methods of epidemiology. Measures of disease frequency, association and impact; study design and data analysis, indices of disease and health; overview of major categories of acute and chronic disease, outbreak investigations, and screening. EPI 610 is a track requirement for MPH - Epidemiology and MSPH – Epidemiology majors, and is also open to other graduate students at the instructor’s discretion.

EPI 614. Epidemiologic Methods Applied to Comparative Effectiveness Research. 3 Hours.
This course will focus on methodological issues pertaining to the design, analysis and interpretation of comparative effectiveness research studies. Special focus will be placed on comparative effectiveness research studies using a non-experimental design and large data base analyses. This course is intended for Master of Science in Public Health and doctoral students in epidemiology, biostatistics, or health care and policy. Doctoral students in other disciplines as well as others interested in comparative effectiveness research are also welcome to enroll with the instructor's permission.
Prerequisites: EPI 610 [Min Grade: C] or EPI 610Q [Min Grade: C]

EPI 616. Environmental Epidemiology. 3 Hours.
Design and conduct of studies examining health effects of environmental exposures. Strengths and limitations of research strategies and interpretation of study results. Areas of interest include air and water pollution, lead, and biological marker outcomes.
Prerequisites: EPI 610 [Min Grade: C]

EPI 618. Fieldwork in Public Health. 2 Hours.
Application of public health principles in communicable disease control and environmental health programs carried out at Jefferson County Department of Health.
Prerequisites: EPI 605 [Min Grade: C] and EPI 610 [Min Grade: C]

EPI 619. Infection Prevention and Hospital Epidemiology. 3 Hours.
The course will provide students with a basic understanding of the area of hospital epidemiology and infection prevention. Notably, the course will cover a review of basic epidemiological methodology, and will then focus on the main areas of surveillance that are critical to infection prevention in addition to methodologies that are specific to hospital epidemiology. Prerequisites: EPI 610 or equivalent introduction to epidemiology course as approved by the course director.
Prerequisites: EPI 610 [Min Grade: C]

EPI 621. HIV/AIDS and STDs. 3 Hours.
Basic biology and pathogenesis, historical and current trends, domestic and international epidemiology, determinants of spread, immunogenetics and host susceptibility, options for prevention, surveillance and control of sexually transmitted diseases (STD's) and HIV/AIDS. If not Public Health student permission of instructor is required.
Prerequisites: EPI 610 [Min Grade: C] or EPI 610Q [Min Grade: C]

EPI 622. An Introduction to REDCap (Research Electronic Data Capture). 3 Hours.
The purpose of this course is to introduce students to the principles of database design and management using REDCap. The course will use the University of Alabama at Birmingham’s response to the COVID-19 pandemic as a case study. The course will provide students with an overview of the principles of and best practices for data collection and management as well as the skills to develop and maintain a database using REDCap. The specific skills to be acquired include creating database forms and fields, creating field validation rules, creating centralized and distributed data collection systems, creating reports, importing and exporting data, quality assurance and control procedures, among others. SAS will be used to illustrate REDCap’s ability to interface with other software packages to facilitate data analysis and report; however, students need not have experience using SAS. The course will also briefly review other database tools include Microsoft Access and Filemaker Pro.

EPI 624. Introduction to Data Analysis with SAS. 2 Hours.
The purpose of this course is to introduce students to the basics of SAS programming. Topics covered will include creation/importation of datasets, working with SAS variables, manipulation of datasets (e.g., combining and subsetting datasets), and SAS syntax to produce descriptive statistics (e.g., frequencies, means) and perform basic statistical procedures (e.g., chi-square, t-test).
Prerequisites: EPI 610 [Min Grade: C] or EPI 610Q [Min Grade: C]

EPI 625. Quantitative Methods in Epidemiology. 3 Hours.
The course will provide students with the knowledge of how to perform basic analyses utilized in epidemiological research. The course will segmented into four modules, with three modules covering how to properly analyze ecological, cross-sectional, cohort, and case control study designs. The course will focus heavily on performing the analyses in SAS, and will continue to expand upon many of the concepts in SAS programming covered in EPI 624. The statistical methods covered will include, but are not limited to, bivariate analyses such as chi-square, t-test, and ANOVA; correlation; and regression methods such as logistic regression, Poisson regression, and Cox proportional hazards regression.

Prerequisites: BST 611 [Min Grade: C] and BST 612 [Min Grade: C] and (EPI 610 [Min Grade: C] or EPI 610Q [Min Grade: C]) and EPI 624 [Min Grade: C]

EPI 627. Data Analysis and Presentation of Epidemiologic Studies. 3 Hours.
Analyze data from an epidemiologic study, addressing a specific questions, and prepare a manuscript from the analysis. There are 3 possibilities regarding choice of data: 1) from a list of the instructor's datasets, 2) public use data, 3) from the student's research. Students working on an MSPH or another degree project may use data for that degree-project with approval of their advisor and course master. Upon completion of the course, the student should be able to analyze data from an epidemiologic study and prepare a manuscript.
Prerequisites: BST 611 [Min Grade: C] and BST 612 [Min Grade: C] and EPI 610 [Min Grade: C] and EPI 624 [Min Grade: C] and EPI 625 [Min Grade: C]

EPI 635. Genetics in Public Health. 2 Hours.
This course will provide a topical overview of issues in public health genetics. The purpose of this course is to introduce students to the complex issues involved in applying and integrating genetic technology and information into public health. Must have permission of instructor to register.

EPI 680. Topics in Clinical Research. 2 Hours.
Provide health sciences professionals interested in clinical trials, clinical epidemiology, and other forms of population research with both essential principles and specific technical knowledge in a variety of areas relevant to the conduct of biological and behavioral investigation of human subjects. NOTE: Limited to health professionals planning clinical research careers who have been accepted into the MSPH in Clinical Research. This course begins in the Spring term and extends into the Summer term. Registration for this course is during the Summer semester. Please contact the Program Coordinator for the course syllabus and course schedule.

EPI 681. Special Topics in Epidemiology Research. 1-3 Hour.
To engage infectious disease research practice encompassing design, conduct, analysis, and interpretation. Students participate in supervised research and/or in research design. Doctoral students are expected to engage in supervised research. NOTE: Permission of instructor.

EPI 682. Gorgas Course in Tropical Med. 3-9 Hours.
Hands-on exposure to tropical diseases and emerging pathogens in various teaching formats: didactic lectures, roundtables, laboratory work, clinical and hospital rounds, case conferences, computer training, field fied trips and independent study. Course is held in during the Spring Term in in Lima, Peru. NOTE:9 hours (3 or Course can be taken for 3, 6 hours are also accepted with or 9 hours; however, evaluation will be restricted to selected sections of the course). course. Spring (Freedman).

EPI 689. Epidemiology Integrative Learning Experience. 3 Hours.
The EPI ILE or capstone course represents a culminating experience that allows students to demonstrate synthesis of MPH foundational and epidemiology concentration competencies. Students will apply their epidemiology and biostatistics skills by designing, analyzing, and disseminating findings of a research project in the form of a high-quality written product. All MPH Epidemiology students must complete this course to graduate in the final term of the MPH program.
Prerequisites: EPI 625 [Min Grade: C] and PUH 688 [Min Grade: C]

EPI 690. Population and Health Outcomes Research Seminar Series. 1 Hour.
The purpose of this class is to provide an opportunity for students interested in population and health outcomes research to participate in seminars related to methodology and career development and to present their work.

EPI 695. Seminar on Selected Environmental Health Topics. 1-9 Hour.
This course will be used as faculty design and craft course topics based on specific interests. These courses will be taught on a masters level.

EPI 698. Master's Level Directed Research Epidemiology. 1-9 Hour.
Independent study with guidance of appropriate public health faculty.

EPI 699. Master's Level Project Research Epidemiology. 1-9 Hour.
Research for project under direction of research committee.
Prerequisites: GAC M

EPI 703. Grant Proposal Writing. 3 Hours.
To provide the student with information about grant writing and practice in preparing a grant proposal for submission. The proposal must relate to an epidemiologic topic. Human subjects issues are discussed. NOTE: Must be a doctoral student or obtain permission of instructor to enroll.

EPI 704. Advanced Epidemiologic Methods. 3 Hours.
This course provides an advanced introduction to fundamental epidemiologic concepts and methods, including causal inference, bias, and study design. This course is the first course in the sequence of the three required core epidemiology courses for doctoral students in epidemiology.

EPI 706. The Epidemiology of Cardiovascular Disease. 2 Hours.
The purpose of this course is to provide exposure to the epidemiology of cardiovascular disease.

EPI 710. Analysis of Case Control Studies. 3 Hours.
This course is designed to provide doctoral students in epidemiology with practical experience in the analysis and interpretation of data from case-control studies. Specific aims are: To outline a strategy for data analysis and review relevant methodologic issues and to apply stratified analysis methods and regression models in the study of diseases of multifactorial etiology. Preq: Requires permission of instructor.
Prerequisites: EPI 704 [Min Grade: C]

EPI 712. Nutritional Epidemiology. 3 Hours.
Nutritional epidemiology will cover core concepts in human nutrition including nutrient classification, nutrient sources, nutritional deficiencies, nutritional excesses, recommended daily allowances, basic anthropometry, dietary assessment methods in free-living populations, validation of dietary assessment methods, identification of biomarkers of dietary intake, study designs used in nutritional epidemiology, issues in the analysis and presentation of dietary data, diet-disease associations, gene-diet associations and special topics in nutrition (e.g., folic acid and neural tube defects, fatty acids and the metabolic syndrome, diet and obesity, vitamin A and immune function, vitamins and mother-to-child transmission of HIV, etc).

EPI 713. Cancer Epidemiology and Control. 3 Hours.
In this course students will learn what is known about the causes of cancer and the control measures used to decrease cancer incidence, decrease cancer mortality, extend cancer survival, and improve quality of life for cancer patients.

EPI 720. Analysis of Follow-Up Studies. 3 Hours.
This course is designed to provide doctoral students in epidemiology with practical experience in the analysis and interprestation of data from follow-up studies. Specific aims are: to outline a strategy for data analysis and review relevant methodologic issues and to apply stratified analysis methods and regression modles in the study of diseases of multifactorial etiology.
Prerequisites: EPI 710 [Min Grade: C]

EPI 721. HIV/AIDS and STDs. 3 Hours.
The course will cover the epidemiology, prevention and control of Sexually Transmitted Diseases (STDs) including the human immune deficiency virus (HIV) infection in both the domestic and international settings. EPI 621 is intended as an elective for second year students and students who have a graduate degree in the Medical Health Professions who are enrolled in any degree track in the School of Public Health. It is considered an elective for the MPH and MSPH programs in Epidemiology. EPI 721 is intended only for doctoral students in the School of Public Health.
Prerequisites: EPI 610 [Min Grade: C] or EPI 610Q [Min Grade: C]

EPI 731. Genetic Epidemiology. 4 Hours.
This course will cover core concepts of designs, methods and statistical tools in genetic epidemiology studies for determining the contribution of genes to disease risk. Methods for incorporating genetic markers into conventional epidemiologic study desgins as risk factors including genetic risk models, familial correlations, migration and admixture, quantitaitve and qualtative traits, association and linkage analyses in family based designs, allele/haplotype frequency estimation, Hardy Weinberg Equilibrium and linkage disequilibrium and application in both family and population based studies will be discussed. Methods for gene-gene and gene-environment interaction assessment, genome wide association studies are also presented. Students not meeting the prerequisites must get permission from the instructor.
Prerequisites: EPI 610 [Min Grade: C] and BST 611 [Min Grade: C] or BST 621 [Min Grade: C]

EPI 781. Special Topics in Epidemiology Research. 3 Hours.
To engage infectious disease research practice, encompassing design, conduct, analysis, and interpretation. Students participate in supervised research and/or in research design.NOTE: Doctoral students are expected to engage in supervised research and must obtain permission of instructor.

EPI 790. Doctoral Seminar in Epidemiology. 2 Hours.
In depth study of several areas of epidemiologic methodology not covered in other courses. Students responsible for selecting and presenting topics. Considerable reading and outside preparation required. NOTE: Requires permission of instructor.

EPI 795. Epidemiology Seminar. 1 Hour.
The purpose of the epidemiology seminar series is to provide a venue for faculty and students of epidemiology to participate in the presentation of a variety of topics and concepts related to the field of epidemiology, biostatistics and public health.

EPI 798. Doctoral Level Directed Research Epidemiology. 1-9 Hour.
Independent study with guidance of appropriate faculty.

EPI 799. Dissertation Research. 1-9 Hour.
Research for dissertation under direction of dissertation committee.
Prerequisites: GAC Z

Health Behavior

Degrees Offered:	M.P.H., Ph.D.
Department Chair:	Kevin Fontaine, PhD
Phone:	(205) 934-6020
Department Contact:	Julie Brown, MS, MBA
Department Contact E-mail:	jebrown@uab.edu
Website:	www.uab.edu/soph/home/health-behavior

Overview

The Department of Health Behavior aims to train social and behavioral scientists to conduct research, develop, and evaluate, implement and disseminate lifestyle modification programs, as well as to integrate ethical, cultural and social justice topics to promote the public's health.

Health Behavior MPH and PhD students learn to use theories and methods from the social and behavioral sciences to develop programs that encourage and promote healthy behaviors. They learn state-of-the-art techniques and methods for research and program evaluation. Doctoral students study these topics in depth as they apply their knowledge and skills in conducting research, writing grant applications, analyzing data, and presenting, publishing, and translating findings. Our research activities focus primarily on obesity and weight management, family and child and adolescent health issues, health disparities, homelessness, sexual health risks including HIV/AIDS prevention and treatment, community-based health promotion, health communication, LGBTQ health and well-being, and dissemination and implementation science.

Degree Programs

- Master of Public Health (MPH) concentration in Health Behavior (Including the Fast Track Program, Accelerated Bachelors/Masters (ABM) and Online Degree Program)
- Doctor of Philosophy (PhD) in Health Behavior

Admissions Information

Master Program Deadline:	www.uab.edu/soph/home/apply/graduate
PhD Program Deadline:	February 15
GPA	3.0
Number of Letters of Recommendation Required:	Three
Entrance Tests: GRE	www.uab.edu/soph/home/apply/graduate
TOEFL	TOEFL is required for international applicants whose native language is not English.
Comments	For additional information please contact Julie Brown, MS, MBA (jebrown@uab.edu, phone: 205-975-8075)

UAB has many degree programs (both face-to-face and online) that can lead to professional licensure or certification. Licensure requirements vary from state to state and by professional organization. Federal Regulations require UAB to provide public or general disclosures on educational programs designed to meet educational requirements for a specific professional license or certification, that is required for employment in an occupation, or is advertised as meeting such requirements. For a list of programs that customarily lead to professional licensure or certification, please visit the UAB Professional Licensure and Certification webpage.

Master of Public Health with a Concentration in Health Behavior

Including the Fast-Track and Accelerated Bachelors/Masters (ABM), and Online Degree Program

The MPH degree in Health Behavior addresses the behavioral, social, and cultural factors related to individual and population health and health disparities. Students in our program will apply social and behavioral science theories to public health problems, develop evidence-based health promotion interventions and disease prevention programs, and apply principles of evaluating health promotion interventions and disease

prevention programs. We emphasize the importance of community based participatory research and applying findings through a variety of behavioral and social science health promotion strategies. Classes are engaging, interactive, and relevant to current health behavior issues.

Graduates of our health behavior program are well positioned for opportunities in local, state, and federal agencies, non-profit/community-based organizations, private research foundations, and the academic setting.

Curriculum

In addition to the MPH core requirements, students take 15 hours of health behavior track courses, a 3 hour internship, 9 hours of electives, and the integrative learning experience course.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement (1 hour)		
ENH 690	Environmental Health Perspectives	1
Concentration Requirements: (15 hours)		
HB 600	Social and Behavioral Sciences in Public Health	3
HB 624	Advanced Social and Behavioral Science Theory	3
HB 636	Developing Interventions to Promote Public Health	3
HB 641	Research Methods in Behavioral Science	3
HB 643	Health Program Evaluation	3
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Approved Electives: (9 hours)		
Select 9 hours of 600-level or higher (HB) courses.		9
Integrative Learning Experience: (2 hours)		
HB 689	Health Behavior Integrative Learning Experience	2
Total Credit Hours:		**44**

Doctor of Philosophy in Health Behavior

The PhD in Health Behavior at the University of Alabama at Birmingham offers an enriching and engaging doctoral curriculum in health behavior combined with world-class research opportunities across Alabama, the United States, and the world. Students are trained to become health behavior scientists in academia, government, industry, and other organizations. Students are equipped to use theories and methods from the social and behavioral sciences to increase the understanding of the determinants of human health behaviors and translate that knowledge into programs, interventions, and policies that encourage healthy behaviors and improve the public's health. Doctoral students learn state-of-the-art techniques and methods to conduct research and program evaluation that can be applied to a variety of employment opportunities located locally, nationally, and globally in many different sectors.

Curriculum

The PhD program requires completion of a minimum of 72 hours of graduate credit, satisfactory performance on the qualifying exam, and completion of a doctoral dissertation. All PhD students must meet the graduation requirements of their department and the UAB Graduate School.

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring) by the end of the second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

Requirements		Hours
Departmental Requirements: (24 hours)		
HB 703	Writing for the Behavioral Sciences	3
HB 712	Examining Health Inequities in Social and Behavioral Sciences	3
HB 724	Advanced Social and Behavioral Science Theory	3
HB 736	Advanced Research Intervention Design	3
HB 737	Advanced Intervention Implementation and Evaluation	3
HB 741	Advanced Research Methods in the Behavioral Sciences	3
GRD 717	Principles of Scientific Integrity	3
PUH 703	Public Health Grant Writing	3
Advanced Research & Stats Methods Courses: (12 hours)		
EPI 610	Principles of Epidemiologic Research	3
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
A Qualitative or Mixed Methods Research Course		3
Health Behavior Electives: (minimum 12 hours)		**12**
Health Behavior Directed Research: (minimum 12)		
HB 798	Doctoral-Level Directed Res	1-9
Health Behavior Dissertation Research: (minimum 12 hours)		
HB 799	Doctoral Dissertation Research	1-9
Minimum Credit Hours Earned		**72**

Courses

HB 600. Social and Behavioral Sciences in Public Health. 3 Hours.
Social and behavioral science theories and strategies in public health will be discussed in relation to preventing disease and promoting health over the life course. The course is comprised of two major sections: (1) overview of fundamentals of social and behavioral sciences in public health and (2) social and behavioral science research and strategies and application of social and behavioral sciences in public health practice and policy.

HB 601. LGBTQ Research Methods. 3 Hours.
The purpose of this course is to provide focused training in methods relating to LGBTQ health. Students taking the course will be provided research skills to assess and address the factors driving SGM risk and resilience in general, with attention to intersectional identities (e.g., race and ethnicity, age, ability, region, religion, and rurality). In addition to building research skills, the course will include topics such as 'equitable budgetary practices,' enabling students to meaningfully and equitably engage community partners throughout the research cycle.
Prerequisites: HB 607 [Min Grade: C] or HB 707 [Min Grade: C]

HB 602. Alcohol and Drug Abuse. 3 Hours.
History and theory of human substance use and abuse. Empirical foundations of alcohol and drug abuse, diagnosis, assessment, treatment, and prevention. Course will be graded by letter. 3 hours.

HB 603. Obesity Prevention & Intervention. 3 Hours.
The aim of this course is to provide students with theoretical and practical knowledge required to develop, implement, and evaluate obesity intervention and prevention programs. The course covers both pediatric and adult obesity intervention and prevention with a focus on lifestyle (dietary intake, physical activity) and environmental factors. Course will be graded by letter. 3 hours.

HB 604. LGBTQ Health and Wellbeing Service Learning. 3 Hours.
The service-learning course will examine LGBTQ health and wellbeing. Specifically, it will take the knowledge learned from courses associated with the LGBTQ health and wellbeing certificate program and enable the students the opportunities to put it into practice. Students will have a range of opportunities to explore what LGBTQ health and wellbeing looks like in practice. Topics include issues related to LGBTQ risk and resilience, policy and programmatic approaches to LGBTQ health and health and wellbeing, as well as the concrete advocacy and leadership skills needed to address the most pressing inequities faced by LGBQ communities in Alabama and the Deep South.
Prerequisites: HB 607 [Min Grade: C] or HB 707 [Min Grade: C]

HB 605. Physical Activity in Public Health. 3 Hours.
This seminar course is an introduction to research and practice related to physical activity promotion from a public health perspective and will describe health benefits, epidemiological data, national recommendations and plans, and global initiatives related to physical activity. Course will be graded by letter. 3 hours.

HB 607. Introduction to LGBTQ Health. 3 Hours.
This course will survey current LGBTQ health topics, including: 1) Defining evolving terms and concepts; 2) Risk and resilience - physical, mental, and behavioral health among LGBTQ individuals; 3) Theories guiding LGBTQ research; 4) Analytic considerations when conducting LGBTQ health inequity research; 5) Ways to improve the provision of services for LGBTQ individuals; 6) Overview of key, local, national, and global policies impacting LGBTQ individuals; and 7) Meaningful integration of LGBTQ communities in policy, programs, and research.

HB 609. African-American Health Issues. 3 Hours.
This is an intermediate level course that focuses on: epidemiological data illustrating the health risks experienced by African-Americans; sociocultural factors essential for understanding and enhancing the health of African-Americans; effective health-related prevention programs for African-Americans.

HB 611. Mental Health as a Public Health Issue. 3 Hours.
This course is designed to increase knowledge of mental illness at the individual, community, and population levels. It also covers historical and contemporary models and research on the etiology, diagnosis, assessment, treatment and prevention of mental and other behavioral health disorders.

HB 612. Examining Health Inequities in Social and Behavioral Sciences. 3 Hours.
This course is designed to provide a comprehensive overview of race/ethnic health disparities/health inequities in the U.S. Both historical context and more current perspectives of identified determinants of health will be discussed as contributors to current health inequities.

HB 613. Health Promotion Practices and Disability. 3 Hours.
This course will examine the population of people living with a disability and health promotion approaches at multiple levels (individual, social, environmental, and policy). One in five people in the U.S. has a disability and many people will be affected by disability, whether personally or through a loved one, during their lifetime. Advancements have been offered by the medical model of disability towards disability prevention; however, the addition of functional and social models of disability provide a more complete view of how to enhance the lives of millions of Americans and reduce economic burden.

HB 615. Homelessness, Housing and Health. 3 Hours.
The course will begin with a discussion of the concept of homelessness and housing instability and their impact on health. We will discuss how homelessness is defined and enumerated, pathways into homelessness, and multi-level interventions to prevent and end homelessness. We will also explore a series of special topics focusing on populations that may be particularly vulnerable to homelessness as well as the intersection between homelessness and experience of particular health conditions and outcomes.

HB 616. Psychophysiology and Public Health: The Interface of the Mind/Body Connection. 3 Hours.
Psychophysiology is a branch of neuroscience that analyses the interfaces of mental states and physiological responses, and how they interact to affect one another and subsequently drive behaviors. This course introduces students to basic knowledge about neuroanatomy, learning/cognition, neurological processes, memory, human development, brain disorders, response patterns, and behavior change strategies as they relate to public health issues such as sexual behavior, drug addiction, cigarette smoking/vaping, and obesity. The course will also introduce principles of stress management and neurofeedback techniques. A biopsychosocial framework will be applied to a range of public health domains, using Maslow's Hierarchy of Needs to inform context and priorities for interventions.
Prerequisites: HB 624 [Min Grade: C] or HB 624Q [Min Grade: C]

HB 617. Implementation Science and Disability Health. 3 Hours.
The course provides lectures on implementation science and a deep dive into a premier, national program for people with disability. Implementation science helps researchers to understand how and why a program is effective in order for it to be translated into practice. Students will gain a better understanding of when and how to use implementation science methods through a series of lectures and multiple assignments including a grant proposal. In addition, this course provides experiential learning opportunities in disability health and community engagement.

HB 618. Suicide Prevention. 3 Hours.
This course will explore the science of suicide prevention. Topics will include exploring the science of suicide through the five pillars of public health, including epidemiology, biostatistics, environmental health, health care organization & policy, and health behavior. Students will also become certified in QPR Gatekeeper training and be responsible for the development of a public health communications project.

HB 624. Advanced Social and Behavioral Science Theory. 3 Hours.
The aim of this course is to provide students with a broad understanding of theories of health behavior change with a strong focus on those theories that are most widely used in research and practice. Emphasis will be given to the discussion and elaboration of important theoretical concepts as well as their application in specific health behavior interventions. This class will take an ecological perspective and discuss theories that approach behavior change from various different levels. Basic theories that are covered in this course include individual level models (Health Belief Model, Theory of Planned Behavior, Transtheoretical Model), interpersonal level models (Social Cognitive Theory), and community level models (community organization and other participatory models like Community Based Participatory Research, Diffusion of Innovations). 3 hours.

HB 625. Dissemination and Implementation in Health. 3 Hours.
The course will offer an introduction to dissemination and implementation science, an interdisciplinary field focused on improving the transition of evidence-based health practices, programs, and interventions from research studies into “real-world” settings.
Prerequisites: HB 600 [Min Grade: C]

HB 630. Health Communications: Theory and Practice. 3 Hours.
This course is designed to investigate the role of communication theories and methods in promoting public health and preventing disease. Both theoretical background in communication and behavioral science and practical communication/intervention development methods will be addressed.

HB 636. Developing Interventions to Promote Public Health. 3 Hours.
This course is intended to provide students with a comprehensive understanding of the range and diversity of intervention approaches to behavior change and their application in public health. Emphasis will be placed on developing skills for designing interventions: a) in various public health settings, b) for specific population subgroups, c) based on determinants identified to be most influential and amenable to intervention, and d) within the confines of available resources.
Prerequisites: HB 624 [Min Grade: C] or HB 624Q [Min Grade: C]

HB 639. Survey Design and Analysis in the Social and Behavioral Sciences. 3 Hours.
This course provides an in-depth treatment of survey design and elementary data analysis procedures commonly associated with social and behavioral research. What are the best practices for asking individuals potentially uncomfortable questions about risky health behaviors? How do we measure the reliability and validity of self-reported behaviors? This course addresses these issues in addition to those of sampling hard-to-reach populations, best practices in questionnaire design, an overview of index and scale construction, and an elementary introduction to data entry and analysis of survey data using common software packages.

HB 641. Research Methods in Behavioral Science. 3 Hours.
Review of research methodology in behavioral sciences. Formulation of research questions, causality, experimental and quasi-experimental designs, reliability and validity, reporting findings. Course will be graded by letter.

HB 643. Health Program Evaluation. 3 Hours.
Principles and procedures to evaluate health promotion/disease prevention programs: data collection methods, instrument-scale development, measurement, evaluation designs and analysis of case studies of disease prevention literature on evaluation.
Prerequisites: HB 641 [Min Grade: C] or HB 641Q [Min Grade: C]

HB 660. Adolescent Health: A Social and Behavioral Perspective. 3 Hours.
Designed to provide students with the most current knowledge and analysis of issues influencing the health and well-being of adolescents. Theoretical frameworks that draw on an ecological perspective will provide a better understanding of how families, peers, schools, and neighborhoods influence risk and protective factors in youth. Emphasis will be placed on the relevance of adolescent health issues for the science of Health Behavior and the broader public health arena.

HB 681. MSPH Directed Research I. 3 Hours.
MSPH Directed Research I provides MSPH students with the opportunity to work closely with a faculty mentor in the design of a health behavior intervention and collection of data. This course is the first in a three-course sequence that culminates in the presentation of research findings to their faculty mentor and other faculty in a public forum. As such, HB 681 focuses on the development of a health behavior intervention in an area of the student’s expertise, including consideration of the PRECEDE/PROCEED model, study population, data collection methods, IRB approval, study registration, previous research, and other activities in consultation with their HB mentor.

HB 682. MSPH Directed Research II. 3 Hours.
MSPH Directed Research II provides MSPH students with the opportunity to work closely with a faculty mentor in the design of a health behavior intervention and collection of data. This course is the second in a three-course sequence that culminates in the presentation of research findings to their faculty mentor and other faculty in a public forum. As such, HB 682 focuses on collection and analysis of data, interpretation of results, and significant progress in the drafting of a scientific manuscript reporting the research project and preliminary results, and other activities in consultation with their HB mentor.
Prerequisites: HB 681 [Min Grade: P]

HB 683. MSPH Directed Research III. 3 Hours.
MSPH Directed Research III provides MSPH students with the opportunity to work closely with a faculty mentor in the design of a health behavior intervention and collection of data. This course is the third in a three-course sequence that culminates in the presentation of research findings to their faculty mentor and other faculty in a public forum. As such, HB 683 focuses on analysis of data, interpretation of results, completion of a scientific manuscript reporting the research project and preliminary results, other activities in consultation with their HB mentor, and the presentation of results in a public forum.
Prerequisites: HB 681 [Min Grade: P] and HB 682 [Min Grade: P]

HB 689. Health Behavior Integrative Learning Experience. 2 Hours.
The HB ILE or capstone course represents a culminating experience that allows students to demonstrate synthesis of foundational and concentration competencies. This course will provide students with the opportunity to use skills gained during the MPH Health Behavior program to develop a high-quality written product that addresses health disparities from a behavioral and social sciences perspective and is ideally useful for an identified stakeholder. All MPH Health Behavior students must complete this course to graduate in the final term of the MPH program.
Prerequisites: PUH 688 [Min Grade: C]

HB 692. Principles and Practices of Community Organization. 3 Hours.
Seminar designed as an integrative experience for persons working with community groups. The focus is on learning to use available resources and advocating change to maximize community involvement.

HB 695. Seminar on Selected Health Behavior Topics. 1-3 Hour.
Seminar covering a variety of health behavior topics.

HB 698. Master's Level Directed Research Health Education. 1-9 Hour.
Independent study with guidance of appropriate faculty. Includes activities such as literature review and evaluation. Course will be graded as Pass/No Pass. 1 - 9 hours.

HB 699. Master's Level Project Research Health Education. 1-9 Hour.
Research for project under direction of research project committee. Course will be graded as Pass/No Pass. 3-6 hours.
Prerequisites: GAC M

HB 701. Theory-Based Measurement Development. 3 Hours.
The aim of this course is to introduce students to measurement development based on well-specified behavioral theories. This course will review and discuss key issues related to measurement development such as item/scale development, number of factors to retain rotation options and statistical programs. Prerequisite: Requires knowledge of elementary probability and statistics for non-statistics majors and BST 611. Course will be graded by letter. 3 hours.
Prerequisites: BST 611 [Min Grade: C]

HB 703. Writing for the Behavioral Sciences. 3 Hours.
The aim of this course is to develop and fine-tune scientific writing proficiency. In this course, students will read and critique a variety of books, essays, and articles about science and medicine, and complete numerous writing assignments and participate in peer review.

HB 707. Introduction to LGBTQ Health. 3 Hours.
This course will survey current LGBTQ health topics, including 1) Defining evolving terms and concepts; 2) Risk and resilience - physical, mental, and behavioral health among LGBTQ individuals; 3) Theories guiding LGBTQ research; 4) Analytic considerations when conducting LGBTQ health inequity research; 5) Ways to improve the provision of services for LGBTQ individuals; 6) Overview of key, local, national, and global policies impacting LGBTQ individuals; and 7) Meaningful integration of LGBTQ communities in policy, programs, and research.

HB 709. African American Health Issues. 3 Hours.
This course will explore issues of both physical and psychological issues of African Americans historically and today. Historical, sociocultural and economic factors that affect the quality and utilization of healthcare services in African American communities will be examined. We will examine the risk and protective factors for specific health conditions. We will also identify evidence-based ways to engage the community and draw on individual and community strengths in prevention and treatment. Students will be equipped and empowered with the knowledge and skills required to develop a Community Action Plan aimed to improve the effectiveness of interventions targeting the African American community.

HB 710. Mental Health Promotion and Professional Development. 1 Hour.
In this course, students will gain knowledge about mental health topics relevant for graduate students, professional students, and postdoctoral fellows and learn skills for managing personal mental health, supporting others' mental health, and intervening when concerned about someone who may be considering suicide. In addition to course credit, students will earn a certificate in QPR Suicide Gatekeeper Training.

HB 711. Advanced Public Mental Health Promotion: Service Learning. 3 Hours.
This advanced course on mental health promotion focuses on evidence-based approaches, innovative service delivery models, and research-practice partnerships to address public mental health. Students acquire skills and hands-on experience related to thinking critically about evidence based approaches, innovative service delivery models, and research-practice partnerships to improve dissemination and implementation.

HB 712. Examining Health Inequities in Social and Behavioral Sciences. 3 Hours.
This course is designed to provide a comprehensive overview of race/ethnic health disparities/health inequities in the U.S. Both historical context and more current perspectives of identified determinants of health will be discussed as contributors to current health inequities.

HB 715. Examining Health Inequities in Social and Behavioral Sciences. 3 Hours.
This course is designed to provide a comprehensive overview of race/ethnic health disparities/health inequities in the U.S. Both historical context and more current perspectives of identified determinants of health will be discussed as contributors to current health inequities.
Prerequisites: HB 641 [Min Grade: C] and HB 643 [Min Grade: C]

HB 716. Psychophysiology and Public Health: The Interface of the Mind/Body Connection. 3 Hours.
Psychophysiology is a branch of neuroscience that analyses the interfaces of mental states and physiological responses, and how they interact to affect one another and subsequently drive behaviors. This course introduces students to basic knowledge about neuroanatomy, learning/cognition, neurological processes, memory, human development, brain disorders, response patterns, and behavior change strategies as they relate to public health issues such as sexual behavior, drug addiction, cigarette smoking/vaping, and obesity. The course will also introduce principles of stress management and neurofeedback techniques. A biopsychosocial framework will be applied to a range of public health domains, using Maslow's Hierarchy of Needs to inform context and priorities for interventions.
Prerequisites: HB 624 [Min Grade: C] or HB 624Q [Min Grade: C]

HB 724. Advanced Social and Behavioral Science Theory. 3 Hours.
This course focuses on a thorough examination of theories and models of behavior change and their applications in both research and implementation in various fields of health promotion and public health. Basic knowledge of research methodology and statistics is required. Course will be graded by letter. 3 hours.

HB 730. Health Communication Research. 3 Hours.
This course is designed to investigate the role of communication theories and methods in promoting public health and preventing disease. Both theoretical background in communication and behavioral science and practical communication/intervention development methods will be addressed.

HB 733. Health, Place, and Society. 3 Hours.
Health, Place, and Society examines social, economic, and political trends within the context of contemporary public health outcomes. Class participants will have a detailed understanding of how the social determinants of health interface with 1) housing policy, 2) employment, 3) education opportunities, 4) economic policy, and 5) social movements. Special emphasis is placed on how these factors follow a measurable pattern affecting intangible outcomes including access to health-enhancing knowledge and tangible outcomes including neighborhood quality and proximity to clean air and healthy foods. Class activities and projects will take a solution-based approach.

HB 736. Advanced Research Intervention Design. 3 Hours.
This course is intended to provide doctoral students with expert knowledge and application skills for designing a range of public health interventions to change behavioral outcomes in various populations. Emphasis will be placed on skill-building for designing relevant, state-of-the-art interventions tailored to unique population subgroups, and adapting existing evidence-based interventions for use with new populations or in new settings. Students will use two textbooks in this course that they will also us in Part 2 of this course (HB-737: Advanced Intervention Implementation and Evaluation). In addition, weekly readings of scientific articles will be assigned. This course uses lecture and seminar format; class time will be structured around lectures, in-class activities, and class discussions of both the lecture and reading materials. Students will complete writing assignments and develop a comprehensive research intervention development and implementation plan that they will later build on and evaluate in HB-737. This course is required for PhD students in Health Behavior.
Prerequisites: HB 724 [Min Grade: C]

HB 737. Advanced Intervention Implementation and Evaluation. 3 Hours.
This course is the second in a series of courses intended to teach doctoral students how to develop, implement, and evaluate theory-based, consumer-driven behavioral interventions. Students will learn how to assess whether interventions worked, build evidence for effective interventions, and adapt, implement, and disseminate interventions. Assignments will include developing a comprehensive evaluation plan for a mock grant application and describing how to adapt an existing evidence-based intervention to a particular content area, outcome target, setting, or population; students will be expected to present their work in class.
Prerequisites: HB 736 [Min Grade: C]

HB 741. Advanced Research Methods in the Behavioral Sciences. 3 Hours.
This course provides an in-depth treatment of the major research designs used in the behavioral sciences. Emphasis is given to the randomized controlled trial as it forms the cornerstone of causal inference in scientific inquiry; however, other designs intended to approximate a randomized trial will be reviewed. The course will also examine methods of collecting, analyzing, and interpreting data. Other topics include evaluating published research that used the methods review in this course, writing research proposals and reports, and ethical considerations. Students must have taken HB 641: Research Methods in Behavioral Sciences or its equivalent as a prerequisite.

HB 742. Mediation and Moderation in Behavioral Science Research. 3 Hours.
This course is an elective course for doctoral students in public health and related fields, designed to provide an exposure to statistical mediation and moderation. Mediation and moderation are central in social and behavioral science research. Mediation explains and tests the underlying mechanisms by which the predictor variable affects the outcome variable, while moderation specifies under what conditions the predictor affects the outcome. Statistical techniques investigating mediation and moderation are among the most widely used data analysis techniques in a variety of disciplines. The primary goal of this course is to provide students with theoretical concepts of mediation and moderation and hands-on experience with relevant analytical techniques. Prerequisite: Students should have taken courses on multiple regression such as BST 611, BST or other equivalent courses. Course will be graded by letter. 3 hours.

HB 770. Doctoral Studies Seminar. 1-3 Hour.
The broad intent of the course is to review current issues relevant to the field of Health Promotion/Health Education, critically examine the relationship between scholarship, research, ethics and funding and reflect and discuss theoretical aspects of Health Promotion/Helath Education.

HB 795. Seminar on Selected Health Behavior Topics. 1-3 Hour.
This course will be used as faculty design and craft course topics based on specific interests. These courses will be taught on a doctoral level.

HB 798. Doctoral-Level Directed Res. 1-9 Hour.
Independent study with guidance of senior public health faculty. Course will be graded as Pass/No Pass. 1 - 9 hours.

HB 799. Doctoral Dissertation Research. 1-9 Hour.
Research for dissertation under direction of dissertation committee. Course will be graded as Pass/No Pass. Prerequisite: Students must be admitted to candidacy in order to register for this class.1 - 9 hours.
Prerequisites: GAC Z

Health Care Organization and Policy

Requirement	Fulfilled By:
Degree Offered:	M.P.H., M.S.P.H., Dr.PH.
Chair:	Martha S. Wingate, DrPH, MPH
Phone:	(205) 934-3939
Website:	www.uab.edu/soph/home/departments/hcop
Department Contact:	Brenda Campbell
Department Contact Email:	bcampbel@uab.edu

Overview

Programs in **Health Policy and Organization** provide training and education at the master's and doctoral level. At the master's level, programs are available for those desiring a career in the analysis of health services policy or in the management of public health services resources. At the doctoral level, our program offers rigorous training in research methods and evidence-based public health practice suitable for careers in public health leadership, or academic settings.
Our programs require mastering major concepts of health economics, public health management and planning, health policy, and outcomes research. Master of Public Health (M.P.H.) degrees are offered in

health policy and organization and maternal and child health policy and leadership. The Master of Science in Public Health (M.S.P.H.) in outcomes research, and the Doctor of Public Health (DrPH) degree has concentrations in health policy and organization, outcomes research or maternal and child health policy.

Degree Programs

- Master of Public Health (MPH) concentration in Health Policy and Organization (Including the Fast Track Program, Accelerated Bachelors/Masters (ABM) and Online Degree Program)
- Master of Public Health (MPH) concentration in Maternal and Child Health Policy and Leadership (Including the Fast Track Program, Accelerated Bachelors/Masters (ABM) and Online Degree Program)
- Master of Science in Public Health (MSPH) concentration in Outcomes Research Online
- Doctor of Public Health (DrPH) concentration in Health Policy and Organization
- Doctor of Public Health (DrPH) concentration in Maternal and Child Health Policy
- Doctor of Public Health (DrPH) concentration in Outcomes Research

Admissions

Requirement	Fulfilled By:
Master Program Deadline:	www.uab.edu/soph/home/apply/graduate
DrPH Program Deadline:	April 1
GPA:	3.0
Number of Evaluation Forms Required:	Three
Entrance Tests: GRE	www.uab.edu/soph/home/apply/graduate
SOPH Admissions:	www.uab.edu/soph/home/apply/graduate

UAB has many degree programs (both face-to-face and online) that can lead to professional licensure or certification. Licensure requirements vary from state to state and by professional organization. Federal Regulations require UAB to provide public or general disclosures on educational programs designed to meet educational requirements for a specific professional license or certification, that is required for employment in an occupation, or is advertised as meeting such requirements. For a list of programs that customarily lead to professional licensure or certification, please visit the UAB Professional Licensure and Certification webpage.

Master in Public Health with a Concentration in Health Policy and Organization

Including the Fast-Track, Accelerated Bachelors/Masters (ABM) and Online Degree Program

This program is designed for individuals who are planning on management-focused careers in public health. Perhaps you aspire to be the Executive Director of a non-profit charitable organization or a senior-level manager in a health department or federal agency. Perhaps you are a physician, nurse, pharmacist, or other clinician who wants to move from direct patient care into a supervisory position with a broad focus on the health of a community. Students in this program are introduced to the public health system and the fundamental skills necessary for practice in the public health sector and managing health care organizations. Required coursework includes basic management disciplines and selected content in economics, finance, marketing, law, and health insurance.

Curriculum

Students in this track must complete 44 credit hours. This includes the MPH core, SOPH requirements, departmental track requirements, electives and internship. Full-time students generally complete this degree in 2 years or less (4-5 semesters). Part-time students may take up to 5 years.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement: (1 hour)		
ENH 690	Environmental Health Perspectives	1
Department Requirements: (9 hours)		
HPO 603	Public Health Policy	3
HPO 609	Public Health Program Planning, Implementation and Evaluation	3
HPO 615	Finance for Health Professionals	3
HPO Concentration Requirements: (9 hours)		
HPO 601	Health Economics	3
HPO 612	Strategic Management in Health Programs	3
HPO 636	Public Health and Healthcare Delivery Systems	1
HPO 637	Design and Management of Complex Public Health Systems	1
HPO 638	Current Issues in Public Health Policy	1
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Approved Electives: (6 hours)		
Select 6 hours from 600-level or higher (HPO) courses		6
Integrative Learning Experience: (2 hours)		
HPO 689	HPO Integrative Learning Experience	2
Total Hours		**44**

Master of Public Health with a Concentration in Maternal and Child Health Policy and Leadership

Including the Accelerated Bachelors/Masters (ABM), and Online Degree Program

The MPH programs in the Maternal and Child Health concentration are designed to educate individuals who will plan, administer, and evaluate

programs in maternal and child health. The programs provide information about the special problems faced by women and children, including children with special health care needs, and their families. The programs develop and integrate skills from maternal and child health, health policy and leadership and demonstrate their application in problem solving and systems development.

Curriculum

Students in this track must complete 44 credit hours. This includes the MPH core, SOPH requirements, departmental track requirements, electives and internship. Full-time students generally complete this degree in 2 years or less (4-5 semesters). Part-time students may take up to 5 years.

Requirements		Hours
MPH Core Requirements: (14 hours)		
PUH 601	This is Public Health	1
PUH 602	Community Assessment	3
PUH 603	Quantitative Methods in Public Health	3
PUH 604	Programs and Policies	3
PUH 605	Public Health Management and Evaluation	3
PUH 606	Leadership for Evidence-Based Public Health	1
MPH Degree Requirement (1 hour)		
ENH 690	Environmental Health Perspectives	1
Department Requirements: (9 hours)		
HPO 603	Public Health Policy	3
HPO 609	Public Health Program Planning, Implementation and Evaluation	3
HPO 615	Finance for Health Professionals	3
MCH Concentration Requirements: (9 hours)		
HPO 602	MCH Evidence-Based Strategies Seminar	1
HPO 605	Foundations of Maternal and Child Health: Programs and Policies for Women, Children, and Families	3
HPO 630	Health and Development: Life Course Approach	2
HPO 632	Leadership in Maternal and Child Health	3
Choose one of the following methods courses: (3 hours)		**3**
HPO 608	Reproductive Health	
HPO 633	Women's Health	
HPO 672	Perinatal Health: Issues, Data, and Policies	
Applied Practice Experience: (3 hours)		
PUH 688	Public Health Internship	3
Approved Electives: (3 hours)		
Select 3 hours from 600-level or higher (HPO) courses		3
Integrative Learning Experience: (2 hours)		
HPO 689	HPO Integrative Learning Experience	2
Total Hours		**44**

Master of Science in Public Health with a Concentration in Outcomes Research Online

The health care field is placing increasing emphasis on the identification and measurement of clinical decision-making and cost/utility analysis. Continuing pressure for the development and measurement of both efficient and effective protocols and health care policies is the driving force underlying this emphasis. Increasingly, employers are seeking qualified analysts to study treatment effectiveness. This program is designed for individuals who want to evaluate the effectiveness and cost-effectiveness of specific health care treatments. You may be a physician who plans on a career in clinical research and wants to determine not only that a treatment works but that it is better than some alternatives after taking into account both cost and a patient's own treatment preferences. You may also be a non-clinician who likes solving complicated modeling problems that may involve simulation or clinical process modeling. Graduates of this track will work in clinical settings, government agencies, managed care organizations, insurance companies, health associations, pharmaceutical firms, and consulting firms analyzing cost effectiveness, utilization, and treatment effectiveness.

Curriculum

Students in this track must complete 42 credit hours. This includes the MSPH core, Outcomes Research track requirements, electives and project research. Full-time students generally complete this degree in 2 years or less (4-5 semesters). Part-time students may take up to 5 years.

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

Requirements		Hours
MSPH Core Requirements: (9 hours)		
BST 611	Intermediate Statistical Analysis I	3
BST 612	Intermediate Statistical Analysis II	3
EPI 610	Principles of Epidemiologic Research	3
Outcomes Research Track: (21 hours)		
HPO 601	Health Economics	3
HPO 621	Clinical Decision Making and Cost-Effectiveness Analysis	3
HPO 623	Pharmacoeconomics and Regulation	3
HPO 670	Social and Ethical Issues in Public Health	3
HPO 677	Patient-Based Outcomes Measurement	3
HPO 687	Empirical Methods for Health Research	3
HPO 691	Policy Analysis: Modeling and Simulation	3
Approved Electives: (3 hours)		
Select 3 hours of 600-level or higher (HPO) courses		3
Master's Directed Research (9 credit):		
HPO 698	Master's Level Directed Research Health Policy and Organization	9
Total Hours		**42**

Doctor of Public Health with a Concentration in Health Policy and Organization

The DrPH degree is the highest professional degree in public health. The DrPH program in the Department of Health Policy and Organization develops leaders and research faculty who have proficiency in data analysis, management, critical thinking, teaching, and translating research into policy and practice. Students will be exposed to complex practical problems facing public health practitioners and policy-makers. The DrPH program has three concentrations (1) **Health Policy and**

Organization, (2) Maternal and Child Health Policy, and (3) Outcomes Research.

Curriculum

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

A minimum of 62 credit hours are required to complete the degree. Students will complete at least 12 credit hours of analytical or methodological courses; 15 hours of DrPH core course, 12 hours of HPO concentration courses, 3 hours of any 700-level electives (as approved by advisor). Students must also complete the doctoral seminars (HPO 796) comprehensive examination (HPO 797), practicum (HPO 793), dissertation proposal/Proposal development (HPO 798), and dissertation research (HPO 799).

Students in the Health Policy and Organization concentration will be required to meet concentration specific prerequisites (or their equivalent as determined by the program director and advisor). **These credits do not count towards the total degree hours:**

Requirements		Hours
HPO CONCENTRATION PREREQUISITES (12 hours)		
HPO 601	Health Economics	3
HPO 609	Public Health Program Planning, Implementation and Evaluation	3
HPO 636	Public Health and Healthcare Delivery Systems	1
HPO 637	Design and Management of Complex Public Health Systems	1
HPO 638	Current Issues in Public Health Policy	1
HPO 720	Health Insurance and Managed Care	3
Total Hours		**12**

DrPH Concentration in Health Policy and Organization Degree Requirements

Requirements		Hours
DrPH Core Requirements: (15 hours)		
HPO 716	Advanced Leadership and Practice Seminar	3
HPO 717	Seminar in Public Health Policy	3
GRD 717	Principles of Scientific Integrity	3
BST 703	Methods in Evidence-Based Public Health	3
PUH 685		3
Concentration Core: (12 hours)		
AH 706	Strategic Management Theory and Research	3
HPO 715	Finance for Health Professionals	3
HPO 718	Management Concepts in Public Health Programs	3
PUH 703	Public Health Grant Writing	3
Methods Core (12 hours):		
HPO 728	Qualitative and Mixed Methods Research in Public Health	3
HPO 781	Research Methods and Study Design	3
HPO 787	Empirical Methods for Health Research	3
Additional 700 Level Methods Elective		3
Approved Electives: (3 hours)		
Select 3 hours of approved 700-level courses		3
Doctoral Seminar: (Minimum 2 hours)		
HPO 796	Doctoral Seminar in Health Policy and Organization	1
HPO 796	Doctoral Seminar in Health Policy and Organization	1
DrPH Practicum and Research: (18 hours)		
HPO 793	DrPH Practicum	6
HPO 797	Directed Readings for DrPH Comprehensive Examination	3
HPO 798	Doctoral Level Directed Research Health Policy and Organization	3
HPO 799	Dissertation Research HPO	6
Minimum Course Credit Hours:		**62**

Doctor of Public Health with a Concentration in Maternal and Child Health Policy

The DrPH degree is the highest professional degree in public health. The DrPH program in the Department of Health Policy and Organization develops leaders and research faculty who have proficiency in data analysis, management, critical thinking, teaching, and translating research into policy and practice. Students will be exposed to complex practical problems facing public health practitioners and policy-makers. The DrPH program has three concentrations (1) Health Policy and Organization, (2) **Maternal and Child Health Policy**, and (3) Outcomes Research.

Curriculum

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

A minimum of 62 credit hours are required to complete the degree. Students will complete at least 12 credit hours of analytical or methodological courses; 15 hours of DrPH core course, 12 hours of HPO concentration courses, 3 hours of any 700-level electives (as approved by advisor). Students must also complete the doctoral seminars (HPO 796) comprehensive examination (HPO 797), practicum (HPO 793), dissertation proposal/Proposal development (HPO 798), and dissertation research (HPO 799).

Students in the **Maternal and Child Health Policy concentration** will be required to meet concentration-specific prerequisites (or their equivalent as determined by the program director and advisor). **These credits do not count towards the total degree hours:**

Requirements		Hours
MCH CONCENTRATION PREREQUISITES (12 hours)		
HPO 602	MCH Evidence-Based Strategies Seminar	1
HPO 601	Health Economics	3
HPO 605	Foundations of Maternal and Child Health: Programs and Policies for Women, Children, and Families	3

HPO 609	Public Health Program Planning, Implementation and Evaluation	3
HPO 630	Health and Development: Life Course Approach	2
Total Hours		**12**

DrPH Concentration in Maternal and Child Health Degree Requirements

Requirements		Hours
DrPH Core: (15 hours)		
HPO 716	Advanced Leadership and Practice Seminar	3
HPO 717	Seminar in Public Health Policy	3
GRD 717	Principles of Scientific Integrity	3
BST 703	Methods in Evidence-Based Public Health	3
PUH 685		3
Concentration Core: (12 hours)		
HPO 714	Life Course Seminar	3
HPO 718	Management Concepts in Public Health Programs	3
HPO 720	Health Insurance and Managed Care	3
PUH 703	Public Health Grant Writing	3
Methods Core: (12 hours)		
HPO 728	Qualitative and Mixed Methods Research in Public Health	3
HPO 781	Research Methods and Study Design	3
HPO 787	Empirical Methods for Health Research	3
Additional 700 Level Methods Elective		3
Approved Elective: (3 hours)		
Select 3 hours of additional 700 level electives [1]		3
Doctoral Seminar: (Minimum 2 hours)		
HPO 796	Doctoral Seminar in Health Policy and Organization	1
HPO 796	Doctoral Seminar in Health Policy and Organization	1
DrPH Practicum & Research: (18 hours)		
HPO 793	DrPH Practicum	6
HPO 797	Directed Readings for DrPH Comprehensive Examination	3
HPO 798	Doctoral Level Directed Research Health Policy and Organization	3
HPO 799	Dissertation Research HPO	6
Total Hours		**62**

[1] Must be 700 level & may be selected from anywhere within the university with advisor approval.

Doctor of Public Health with a Concentration in Outcomes Research

The DrPH degree is the highest professional degree in public health. The DrPH program in the Department of Health Policy and Organization develops leaders and research faculty who have proficiency in data analysis, management, critical thinking, teaching, and translating research into policy and practice. Students will be exposed to complex practical problems facing public health practitioners and policy-makers. The DrPH program has three concentrations (1) Health Policy and Organization, (2) Maternal and Child Health Policy, and (3) **Outcomes Research**.

Curriculum

All students in an MSPH, MS, DrPH, or PhD program are required to complete PUH 600: Overview of Public Health. The course must be completed in a single semester (Fall or Spring); students must complete the course by the end of their second semester in the program. Students with prior public health education (BS in Public Health or MPH) or extensive public health experience (5+ years in public health practice) may be waived from this requirement by permission of the Associate Dean for Academic Affairs, but this is rare.

A minimum of 62 credit hours are required to complete the degree. Students will complete at least 12 credit hours of analytical or methodological courses; 15 hours of DrPH core course, 12 hours of HPO concentration courses, 3 hours of any 700-level electives (as approved by advisor). Students must also complete the doctoral seminars (HPO 796) comprehensive examination (HPO 797), practicum (HPO 793), dissertation proposal/Proposal development (HPO 798), and dissertation research (HPO 799).

Students in the **Outcomes Research concentration** will be required to meet concentration-specific prerequisites (or their equivalent as determined by the program director and advisor). **These credits do not count towards the total degree hours:**

Requirements		Hours
CONCENTRATION PREREQUISITES (6 hours)		
HPO 601	Health Economics	3
HPO 720	Health Insurance and Managed Care	3
Total Hours		**6**

DrPH Concentration in Outcomes Research

Requirements		Hours
DrPH Core: (15 hours)		
HPO 716	Advanced Leadership and Practice Seminar	3
HPO 717	Seminar in Public Health Policy	3
GRD 717	Principles of Scientific Integrity	3
BST 703	Methods in Evidence-Based Public Health	3
PUH 685		3
Concentration Core: (12 hours)		
HPO 721	Clinical Decision Making and Cost Effectiveness Analysis	3
HPO 777	Patient-Based Outcomes Measurement	3
HPO 791	Policy Analysis: Modeling & Simulation	3
PUH 703	Public Health Grant Writing	3
Methods Core: (12 hours)		
HPO 728	Qualitative and Mixed Methods Research in Public Health	3
HPO 781	Research Methods and Study Design	3
HPO 787	Empirical Methods for Health Research	3
Additional 700 Level Methods Elective		3
Approved Electives: (3 hours)		
Select 3 hours of any 700-level electives [1]		3
Doctoral Seminar: (Minimum 2 hours)		
HPO 796	Doctoral Seminar in Health Policy and Organization	1
HPO 796	Doctoral Seminar in Health Policy and Organization	1
DrPH Practicum & Research: (Minimum 18 hours)		
HPO 793	DrPH Practicum	6
HPO 797	Directed Readings for DrPH Comprehensive Examination	3

HPO 798	Doctoral Level Directed Research Health Policy and Organization	3
HPO 799	Dissertation Research HPO	6
Total Hours		**62**

[1] Must be 700 level & may be selected from anywhere within the university with advisor approval.

The Graduate School

Today's professionals face an increasingly competitive world. In addition to demonstrating mastery in their fields of study, employers expect graduates to demonstrate competencies and leadership skills as well as the ability to foster and contribute to equitable and inclusive workplaces. Institutions and industries seek employees with skills in areas of research communication, university teaching and academic advising, writing and publishing, interdisciplinary collaboration, leadership, and mentoring. Indeed, many leading institutions view these abilities as prerequisites for career advancement. This is why the **UAB Office of Professional Studies and Experiential Learning (OPSEL)** offers ongoing support for students, post-doctoral fellows, faculty, and staff who want to take advantage of the school's resources to enhance their skills.

OPSEL offers a plethora of academic and professional development learning opportunities including two interdisciplinary master's degrees, certificates, courses, seminars, day-long workshops, and free mini-workshops in a variety of areas, such as

- Interdisciplinary Graduate Studies – *MS and MS degrees available*
- Academic Advising - *Certificate available*
- Diversity, Equity, Inclusion, & Advocacy - *Certificate available*
- Leadership & Professional Development - *Certificate available*
- Mentoring & Leadership - *Certificate available*
- Research Communication - *Certificate available*
- Research Laboratory Management - *Certificate available*
- Teaching at the College Level - *Certificates available*
- Critical Thinking
- Job Search
- Presentation and Discussion Skills
- Responsible Conduct of Research

Check out the Current Class Schedule for a list of available offerings, or visit the OPSEL webpage for detailed information on our free mini-workshops.

AADV-Academic Advising Courses

AADV 600. Academic Advising Foundations. 3 Hours.
The purpose of this course is to provide current or aspiring academic advising professionals with a learning environment to enhance their understanding and ability to apply historical developments and theoretical foundations to their advising practices. Students will demonstrate their understanding of NACADA's core conceptual and informational competencies as well as their ability to apply core relational components of the academic advising profession, the pillars of academic advising, and CAS Standards within the practice.

AADV 601. Professional Writing for Academic Advisors. 1 Hour.
AADV 601 prepares Academic Advisors with professional writing skills important to success as advisors and advising program administrators. You will engage in self as well as peer review processes to facilitate your professional writing abilities. Expect to develop draft, review, finalize and submit a variety of professional writing samples including, yet not limited to, recommendation letters, emails, meeting agendas, and an academic advising project proposal.

AADV 605. Prioritization and Decision-Making in Academic Advising. 1 Hour.
AADV 605 prepares Academic Advisors with opportunities to apply skills associated with evaluating and prioritization processes to efficiently make effective and purpose-informed decisions. Additionally, learners will practice skills associated with supporting the development of prioritization skills among others.

AADV 606. Emotional Intelligence in Academic Advising. 1 Hour.
AADV 606 prepares Academic Advisors with opportunities to self-assess and apply skills associated with emotional intelligence as well as the role that it plays in academic advising processes. Additionally, learners will practice skills associated with supporting the development of emotional intelligence among others.

AADV 610. Assessment in Academic Advising. 3 Hours.
The purpose of this course is to enhance learners' understanding of and ability to apply assessment within academic advising practices. Learners will articulate why individual and programmatic assessment is important to academic advising practices and will demonstrate their ability to synthesize assessment data into meaningful suggestions for academic advising practice, procedures, and/or policy development.
Prerequisites: AADV 600 [Min Grade: B]

AADV 620. Diversity, Equity, Inclusion, and Advocacy in Academic Advising. 3 Hours.
This course explores the relevance and value of diversity, equity, inclusion, and advocacy within the academic advising profession. Learners will study the skills and environmental factors associated with developing inclusive and equitable academic advising experiences for diverse student populations. A strong component of this course is preparing learners about principles of advocacy so that they are prepared to foster efficacious academic advising sessions, practices, programs, and policies in their campuses.

AADV 625. Resilience in Academic Advising. 2 Hours.
AADV 625 prepares Academic Advisors with opportunities to self-assess and apply skills associated with resilience and leadership as well as the role that it plays in academic advising processes. Additionally, learners will practice skills associated with supporting the development of resilience among others.

AADV 630. Special Topics Seminar in Academic Advising. 1-3 Hour.
This course will provide you with opportunities to practice a specific skill or competency associated with career success or advancement within the academic advising field. Academic Advisors serve to support the academic, career, and personal development and success of students as they persist towards degree completion. The purpose of this seminar is to provide you with opportunities to enhance your abilities to support students in developmentally appropriate ways that align with their academic, career, and/or personal goals. The primary difference between AADV 630 and AADV 640 relates to the learning activity formats and modes of content delivery. Seminars are facilitated by the instructor and delivered/created through the discourse and engagement of learners in the course. Workshops are designed with structured hands-on, skill practice sessions delivered by the instructor and experienced by the learners.

AADV 631. Academic Advising and Transfer Students. 3 Hours.
Academic Advisors serve to support the academic, career, and personal development and success of students as they persist towards degree completion. The purpose of this seminar is to provide you with opportunities to enhance your abilities to support transfer students in developmentally appropriate ways that align with their academic, career, and/or personal goals.

AADV 640. Special Topics Workshop in Academic Advising. 1-3 Hour.
This course will provide you with opportunities to practice a specific skill or competency associated with career success or advancement within the academic advising field. Academic Advisors serve to support the academic, career, and personal development and success of students as they persist towards degree completion. The purpose of this seminar is to provide you with opportunities to enhance your abilities to support students in developmentally appropriate ways that align with their academic, career, and/or personal goals. The primary difference between AADV 630 and AADV 640 relates to the learning activity formats and modes of content delivery. Seminars are facilitated by the instructor and delivered/created through the discourse and engagement of learners in the course. Workshops are designed with structured hands-on, skill practice sessions delivered by the instructor and experienced by the learners.

AADV 644. Conflict Resolution in Academic Advising. 1 Hour.
AADV 644 prepares Academic Advisors with opportunities to learn about and apply skills associated with conflict resolution and feedback as well as the role that it plays in academic advising processes. Additionally, learners will practice skills associated with supporting the development of associated communication skills among others.

Divrsty Equity Incl Advocacy Courses

DEIA 510. Diversity Policy Politics and Practice. 3 Hours.
Diversity and Inclusion are popular terms. This course is an exploration of the origins, historical landmarks, scholarship, and practices of the field of Diversity and Inclusion.

DEIA 520. Equity and Inclusion. 3 Hours.
Diversity, Equity and Inclusion offices have been established in many corporate, government and higher education environments. While the term diversity is common and more widely understood in organizations, equity and inclusion are somewhat more elusive and require intentional effort. This course will address approaches to equity and inclusion in organizations.

DEIA 530. Leadership in Social Justice Advocacy, Self and Others. 3 Hours.
In this course we will examine leadership and advocacy issues, models, competencies and approaches related to the practice of diversity, equity and inclusion. Topics include social justice, advocacy and empowerment obligations, both to the profession and to the individuals served by professional diversity practitioners.

DEIA 590. Engaged Scholarship in Diversity, Equity, Inclusion, and Advocacy. 1-4 Hour.
This course is an upper-division research practicum focused on integration of previous DEI certification courses. The Advancing Equity in DEI Engaged Scholarship practicum serves as the link between knowledge gained in the classroom and the practice of inclusive excellence from an advanced generalist perspective. The purpose of this course is three-fold: (a) to enhance the student's ability to apply diversity, equity, and inclusion values, theory, concepts, skills, and knowledge to a broad range of systems; (b) to provide opportunities for students to learn to foster one’s own mindfulness and empowerment among vulnerable populations; and (c) to provide a setting in which the mission and goals of the curriculum of the University of Alabama at Birmingham may be actualized. Students have the opportunity to apply and refine values, knowledge, and skills under the guidance of experienced focus area practitioners who serve as Field Supervisors. The practicum requirements are structured within four areas and field settings to ensure that students gain experience in developing a full range of advanced equity work. These four areas are: (1) Education equity, (2) health equity, (3) Community based engagement, and (4) Organizational equity and well-being.

GRD-Graduate School Courses

GRD 520. Special Topics. 1-4 Hour.
This course addresses topics of current interest related to professional development.

GRD 542. Leading Diverse Teams. 1-2 Hour.
This course provides students with opportunities to comprehend, articulate and apply skills related to leading and building professionally diverse teams.

GRD 600. Core Issues in Aging. 3 Hours.
A multidisciplinary approach will be used to consider dimensions of the aging process. This course explores individual and societal meanings of aging and old age through the study of the biological, psychological and sociological changes accompanying aging as well as current issues and controversies in the study of aging.

GRD 617. Critical Thinking and Scientific Integrity for Masters Students. 3 Hours.
This course will give masters students an introduction to the rules of logic and reason that are necessary for effective scientific discourse and debate. In addition, students will be introduced to best practices in the responsible conduct of research, including rigor and reproduciblility.

GRD 620. Special Topics. 1-4 Hour.
This course addresses topics of current interest related to professional development.

GRD 647. Navigating the Job Market. 1-3 Hour.
This course explores the academic and non-academic job markets and the documents and professional skills needed to navigate them effectively.

GRD 690. IGS Capstone: Research to Practice. 1-6 Hour.
This is the Capstone course for the Interdisciplinary Graduate Studies degree. The course addresses the research to practice cycle for professional practitioners. Focuses on developing skills and knowledge for understanding, critiquing, and applying research to practice, as well as the role of practitioners in identifying additional areas of needed research. Course may only be taken during the semester in which the learner is completing their IGS program. Learners will demonstrate their understanding, as well as abilities to apply and evaluate, critical thinking skills, deconstruct research reports, and synthesize a program or project proposals in order to facilitate success within their professional field. Learners are required to engage in readings, discussions, learning activities, and ultimately disseminate their final program, project, practice or policy proposal publicly.

GRD 701. Presentation and Discussion Skills. 3 Hours.
Develops professional communication skills, including public speaking skills, conversation management, adapting to audience, and overall comprehensibility. Presentations critiqued by self, peers, and instructor.

GRD 703. Special Topics. 1-4 Hour.
This course addresses topics of current interest related to professional development.

GRD 704. Specialized Instruction. 1-9 Hour.
This individualized course addresses particular communication needs of students actively writing theses, dissertations, articles for publication, and grant proposals. Individual plans approved by instructor are required.

GRD 705. Teaching at the College Level. 2-3 Hours.
Introduces many of the basic principles needed to teach effectively at the college level and addresses current issues relevant to college teaching. Topics include creating a learning environment, course and syllabus design, active learning approaches, evaluation and grading, and using technology to enhance learning.

GRD 706. Grants and Fellowships 101. 1 Hour.
Introduces the extramural funding process. Topics include types of awards, funding sources, components of an application, the review process, and writing effective grant proposals. One-day workshop.

GRD 707. Presenting Effectively. 1 Hour.
Provides an overview of giving effective oral presentations in academic and professional settings. Topics include analyzing audience and purpose, characteristics of an effective delivery, strategies for planning and design, handling questions and answers, boosting confidence, and using technology in presentations. One-day workshop.

GRD 708. Writing Successfully. 1 Hour.
Addresses issues involved in writing for academic and professional settings. Topics include analyzing audience and purpose, addressing common writing problems, developing effective writing practices, writing for publication, communicating research to the general public, and productivity strategies for writers. One-day workshop.

GRD 709. Writing Fellowships. 3 Hours.
Participants are introduced to ways to construct a biosketch, search for funding sources, how to construct a fellowship budget, and grant-related administrative policies. The importance of peer review and how to respond to reviewer critiques is covered as well as training plans, team-building and peer-review skills.

GRD 710. Career Workshop for Graduate Students. 1 Hour.
This workshop introduces a variety of career choices for students working on advanced degrees in the life sciences. Topics may include sources of career information, self-assessment, resume construction, interviewing, using new technologies in job searches, career choices, the hidden job market, networking, and negotiating.

GRD 711. Special Topics. 1-3 Hour.
This course addresses topics of current interest related to professional communication, career development, and ethics.

GRD 713. Mentoring 101. 1 Hour.
This seminar will cover the science and theory on mentoring, including the mentor-mentee relationship, issues of gender, culture, age, and other power differentials; contemporary mentoring strategies as they relate generally and specifically to situations and fields; applying different mentoring models to real life/workplace.

GRD 715. Preparing TAs to Be Effective Teachers. 2 Hours.
Prepares teaching assistants to meet the educational needs of undergraduate students by developing effective teaching practices. Topics include preparing to teach, presenting material effectively, handling questions, handling difficult students and situations, leading laboratory sections, and ethical issues related to teaching.

GRD 716. Developing a Teaching Portfolio. 2 Hours.
This hybrid course guides students in developing a Teaching Portfolio for improving teaching practices and enhancing job search potential. The web-based curriculum introduces essential elements of the portfolio and guides students in drafting a personal Philosophy of Teaching.

GRD 717. Principles of Scientific Integrity. 3 Hours.
Surveys ethical issues and principles in the practice of science.

GRD 719. Introduction to Mentoring & Leadership. 3 Hours.
This course covers the principles of mentoring and leadership, focusing on the student's ability to demonstrate, analyze, and evaluate contemporary mentoring and leadership practices. Application positions students to tailor practices to their respective fields, articulate a mentoring and leadership philosophy and develop new career skill sets while producing a mentoring and leadership portfolio.

GRD 722. Writing Research for Broad Audiences. 3 Hours.
Introduces students to effectively writing about research for broad audiences, including the media, policy makers, and general public. Students learn to write various genres of texts, such as blog posts, press releases, letters-to-the-editor, and feature articles.

GRD 723. Writing Research for Academic Audiences. 3 Hours.
Introduces students to effectively writing about research for academic, scientific, and specialist audiences. Students learn to write various genres of texts, such as abstracts, reviews, and research papers.

GRD 727. Writing & Reviewing Research. 3 Hours.
Introduces writers to research writing “best practices,” criteria for evaluating writing, plus editing and peer review. Writers analyze and write short, strategic texts (on their own topics) in 5 research genres – critiques, annotated bibliographies, introductions, empirical, and review articles – based on peer and instructor feedback, for a draft presentation or proposal. For anyone writing course papers, theses, and/or proposals.

GRD 728. Professional Writing & Publishing. 3 Hours.
Introduces writers to “best practices” in academic/professional writing and publishing, plus editing, and peer review. Writers analyze and write short, strategic texts (in their own topics) in 7 academic/professional genres: abstracts, scholarly/empirical articles, review/historical articles, book chapters, opinion, professional philosophy statements, and digital journalism (writing for the public), based on peer review and instructor feedback, to produce a draft submission and publishing plan. For anyone writing for publication (including a dissertation).

GRD 729. Writing Your Journal Article in 12 Weeks. 3 Hours.
Introduces writers to a systematic approach to writing a journal article, including essential structures, stylistic conventions, and smart strategies for planning and completing projects under a deadline. Writers begin with their own working manuscripts (unpublished course paper, thesis, dissertation, etc.), identify a target journal, and draft short, strategic sections, based on peer review and instructor feedback, to create a final submission, per author’s guidelines. For anyone with active publishing goals.

GRD 730. Developing and Managing Your Professional Image. 3 Hours.
This course is designed to raise student awareness of their professional image. Topics include professional perception, polishing professional image, adjusting to professional contexts, and professional image and social media.

GRD 733. Managing & Leading Teams. 1 Hour.
This workshop will cover the latest science in managing and leading teams across disciplines, focusing on team building, the students' development of team presentations, peer discussion and review.

GRD 734. Ethical Leadership Development. 3 Hours.
Designed for those who want to apply evidence-based models to ethical decisions in a professional setting, this course positions students to tailor practice to their own careers, articulate an ethical philosophy for a portfolio, and model ethics as a leader in their respective fields.

GRD 735. Leadership 101. 1 Hour.
This seminar covers organizational leadership theory, as well as contemporary leadership models and strategies as they relate generally and specifically to situations and fields.

GRD 739. Research Communication Portfolio. 3 Hours.
This Science Communication Portfolio course focuses on the student's compilation of course experiences in key areas, such as science journalism, science public relations, medical writing, and entrepreneurship.

GRD 740. UAB Prep Scholar Workshop. 1-3 Hour.
This course will provide extensive professional development activities to prepare UAB PREP Scholars for entry into graduate school.

GRD 741. UAB PREP Scholar Workshop I. 1-3 Hour.
This course will provide writing and other enrichment activities to prepare UAB PREP Scholars for entry into graduate school.

GRD 742. UAB PREP Scholar Workshop III. 1-3 Hour.
This course will provide extensive professional development activities to prepare UAB PREP Scholars for entry into graduate school.

GRD 743. Critical Thinking and Quantitative Concepts. 3 Hours.
The goal of this course is to enhance students' critical thinking skills in the context of rigorous experimental design and quantitative analysis. Specifically, students will engage in activities that explore robust and unbiased approaches toward analysis, interpretation, and reporting of experimental results.

GRD 744. Leadership Survival Skills. 1 Hour.
In this course, participants explore the day-to-day activities of leaders, including organizational mission, vision, values, and goals, budgeting, human resources, and project management. Case studies are used to help students reflect on and discuss solutions from a leader's perspective.

GRD 745. Communication and Diversity Leadership. 3 Hours.
Upon completion of the course, students will be able to explain, analyze, and apply approaches to leading and communicating in diverse communities.

GRD 746. Critical Decisions in Mentoring & Leadership. 3 Hours.
This course explores the critical thinking skills related to the decision making processes for mentors and leaders.

GRD 747. Navigating the Job Market. 3 Hours.
This course explores the academic and non-academic job markets and the documents and professional skills needed to navigate them effectively.

GRD 748. Faculty Mentoring in Higher Education. 1 Hour.
In this one-day workshop, faculty will explore the mentor/mentee relationship in higher education, as well as peer mentoring, role modeling, coaching, and formal/informal mentoring structures.

GRD 749. Improvisational Techniques to Improve Leadership, Teaching, and Research Communication. 1 Hour.
This workshop engages participants through improvisational and theatrical techniques in order to build confidence and improve as leaders, teachers, and/or researchers.

GRD 750. CIRTL Seminar in Learning. 2 Hours.
CIRTL seminar provides opportunities for students to read and discuss basics of effective teaching and learning.

GRD 751. CIRTL Teaching Methods. 2 Hours.
This CIRTL seminar provides opportunities for students to read and discuss teaching as research projects.

GRD 752. Introduction to Evidence-based Teaching. 2 Hours.
This CIRTL Network seminar is designed for graduate students and postdoctoral scholars who plan to teach undergraduate STEM (science, technology, engineering, and mathematics) courses. It addresses a range of topics focused on enhancing STEM teaching.

GRD 753. CIRTL Seminar on STEM Academic Teaching Careers. 1-3 Hour.
This CIRTL Network seminar provides an overview of types of academic teaching positions and addresses topics related to academic careers.

GRD 754. Advanced Evidence-based Teaching. 2 Hours.
This CIRTL Network course explores effective research-based teaching approaches for enhancing learning in STEM (science, technology, engineering, and math) courses. Approaches such as collaborative learning, team-based learning, flipped classrooms, inquiry science, case studies, and problem-based learning will be considered.

GRD 755. CIRTL Teaching Practicum. 3 Hours.
This CIRTL course provides students a structured observation and practicum experience in which they shadow a faculty member as he/she teaches a semester-long course and engage in a variety of guided teaching activities.

GRD 756. CIRTL The College Classroom. 2 Hours.
This CIRTL Network course provides students with the basics of effective teaching with an emphasis on the learning-centered classroom and the interconnected cycle of teaching, assessment, and learning.

GRD 757. CIRTL Effective Use of Technology in Teaching and Learning. 2 Hours.
This CIRTL Network course provides students with strategies and technological choices and tools for effective use of instructional technology in their teaching practices.

GRD 758. CIRTL Diversity in the College Classroom. 2 Hours.
This CIRTL Network course addresses different aspects of diversity, particularly in STEM (science, technology, engineering, and math) education, with the underlying principle of equitable access and enhanced learning of all students. Topics include gender, race, culture, disability, first-generation college students, ethnically diverse students (men of color, Latino/as, and international students), and learning style/ environment.

GRD 759. CIRTL Teaching-as-Research in STEM Courses. 3 Hours.
This CIRTL course introduces Teaching-as-Research project design and guides students through the TAR planning process.

GRD 760. CIRTL Teaching-as-Research Project. 3 Hours.
This CIRTL course is designed for students who are conducting a Teaching-as-Research project.

GRD 761. CIRTL Special Topics. 1-5 Hour.
This CIRTL course addresses topics of current interest related to college teaching.

GRD 762. CIRTL Individualized Seminar. 1-3 Hour.
This CIRTL seminar addresses teaching and learning projects related to STEM (science, technology, engineering, and math). Individual plans approved by the instructor are required.

GRD 763. CIRTL Individualized Teaching and Learning Project. 1-3 Hour.
This CIRTL individualized course provides students with opportunities to engage in teaching and learning projects related to undergraduate STEM (science, technology, engineering, and math) education. Individual plans approved by the instructor are required.

GRD 764. CIRTL Individualized Teaching Experience I. 1-5 Hour.
This CIRTL individualized course provides students with opportunities to teach and reflect on these experiences in a variety of teaching contexts. Co-instructor students serve as "Teaching Fellows". Individual plans approved by the instructor are required.

GRD 765. CIRTL Individualized Teaching Experience II. 1-5 Hour.
This CIRTL individualized course provides students with opportunities to teach for more extended periods and to reflect on these experiences in a variety of teaching contexts. Individual plans approved by the instructor are required.

GRD 766. Introduction to Online Teaching. 1 Hour.
Learn basics of developing and teaching an online course including how to structure content, effective interaction and communication, active online engagement techniques and assessments.

GRD 770. Intro to Biostats. 2-3 Hours.
This course is intended to provide graduate students with an introduction to biostatistics. The emphasis in this course will be upon understanding statistical concepts and applying and interpreting tests of statistical inference. Content will include but not be limited to: choosing the correct test for a given research design, data and data files, data screening, scaling, visual representations of data, descriptive statistics, correlation and simple regression, sampling distributions, and the assumptions associated with and the application of selected inferential statistical procedures (including t-tests, Chi-square, and ANOVA). Computer software (SPSS) will be employed to assist in the analysis of data for this course. Students should have access to a computer, SPSS software, and the Internet.

GRD 771. ePortfolio Workshop. 1 Hour.
Learn how to Build a personalized website to host your Teaching and/or Mentoring Portfolio or for personal branding/ promotion.

GRD 772. Emotionally Intelligent Leadership. 1-2 Hour.
This course provides students with opportunities to explore the relationships among emotional intelligence (EI), leadership, and professional development.

GRD 773. Research Lab Management. 3 Hours.
By successfully completing this course, enrolled participants should be able to i) construct a start-up budget; ii) design a safe research laboratory environment; iii) hire, mentor and manage research lab staff and trainees; and iv) develop and implement a research lab management plan. Submission of a completed research lab management plan will be used to measure attainment of learning objectives.

GRD 774. Introduction to Regulatory Compliance. 1 Hour.
Enrolled participants will examine regulatory compliance issues related to basic research needs, including but not limited to animal use, human subjects and export control. Completion of in-class activities will be used to measure attainment of learning objectives.

GRD 775. Research Lab Safety. 1 Hour.
Enrolled participants will examine general laboratory safety practices and should be able to i) design a safe laboratory plan; and ii) develop lab safety-related standard operating procedures. Completion of in-class activities will be used to measure attainment of learning objectives.

GRD 776. Blazer Fellows Introduction to Professional Development. 3 Hours.
GRD 776 is a 3-credit course for Blazer Fellows to introduce professional development tools and skills that will be necessary and useful for doctoral students' professional career.

GRD 790. Research/Lab Rotation. 1-10 Hour.
Graduate Lab Rotation Used by MD/PhD Students first summer semester.

IGS-Interdisc Graduate Courses

IGS 690. Capstone: Research to Practice. 3 Hours.
This is the Capstone course for the Interdisciplinary Graduate Studies degree. The course addresses the research to practice cycle for professional practitioners. Focuses on developing skills and knowledge for understanding, critiquing, and applying research to practice, as well as the role of practitioners in identifying additional areas of needed research. Course may only be taken during the semester in which the learner is completing their IGS program. Learners will demonstrate their understanding, as well as abilities to apply and evaluate, critical thinking skills, deconstruct research reports, and synthesize a program or project proposals in order to facilitate success within their professional field. Learners are required to engage in readings, discussions, learning activities, and ultimately disseminate their final program, project, practice or policy proposal publicly.

LEAD-Leadership Courses

LEAD 500. Introduction to Leadership Behaviors, Characteristics and Theories. 3 Hours.
This course introduces students to the study of leadership and behaviors associated with core career readiness and advancement. Students will identify personal strengths and areas for growth relative to employer expectations.

LEAD 503. Professional Interveiw and Interviewing Skills for Leaders. 1 Hour.
This course provides students with opportunities to apply skills associated with engaging in professional interviews as well as developing and conducting interviews.

LEAD 504. Introduction to Organizational Change Processes. 1-2 Hour.
This course provides students with opportunities to gain knowledge and competencies related to understanding, navigating, and supporting others during organizational change.

LEAD 520. Ethics in the Workplace. 3 Hours.
This course introduces students to ethical leadership and work ethics. Skills discussed and practiced include but are not limited to decision making, prioritization, reasoning, and values clarification.

LEAD 521. Servant Leadership. 1-2 Hour.
This course provides students with opportunities to gain knowledge and competencies related to Servant Leadership philosophies and approaches.

LEAD 525. The Resilient Leader - Self and Others. 1-2 Hour.
This course provides students with opportunities to comprehend, articulate and apply skills related to resilience in leadership and professional development.

LEAD 526. Goal Setting for Leaders. 1 Hour.
This course provides students with opportunities to learn about and practice goal setting strategies associated with personal and professional success.

LEAD 540. Team Development and Dynamics. 3 Hours.
This course introduces students to the benefits of teams and teamwork. Students will practice leadership competencies associated with developing productive teams, and assessing team dynamics.

LEAD 541. Building Effective Teams. 1-2 Hour.
This course provides students with opportunities to comprehend, articulate and apply skills related to building effective and professional teams.

LEAD 544. Conflict Negotiation in Leadership. 1 Hour.
This course provides students with opportunities to apply skills associated with managing conflict and facilitating productive conversations in professional and/or leadership settings.

LEAD 545. Planning and Facilitating a Retreat. 1-2 Hour.
This course provides students with opportunities to comprehend, articulate and apply skills related to planning and facilitate a leadership and/or professional development retreat.

LEAD 560. Leadership and Professional Development Workshop. 1-3 Hour.
Subject matter in this course will vary to in order to promote workshop specific leadership skill acquisition not addressed in other LEAD courses based upon assessed needs.

LEAD 580. Leading Transformational Change. 3 Hours.
This course examines the multiple facets associated with both andrological and pedagogical change from the fundamental conceptualization of the design phase through the implementation phase. A meaningful learning experience is emphasized along with the capture of teachable moments and the culmination phase of evaluation ad revision. The student will use evidenced-based practice to form the pillars of a learning experience, evaluation, and revision for improvement.

LEAD 590. Leadership by Design. 3 Hours.
This course provides students with an opportunity to learn about and apply the Designed Thinking process to propose a solution for an industry specific issue. Students choose the industry for which they design a solution. This is the capstone course for the LEAD graduate certificate program.
Prerequisites: LEAD 500 [Min Grade: C] and LEAD 520 [Min Grade: C] and LEAD 540 [Min Grade: C]

MENT-Mentoring Leadership Courses

MENT 719. Introduction to Mentoring and Leadership. 3 Hours.
This course covers the principles of mentoring and leadership, focusing on the student's ability to demonstrate, analyze, and evaluate contemporary mentoring and leadership practices. Application positions students to tailor practices to their respective fields, articulate a mentoring and leadership philosophy and develop new career skill sets while producing a mentoring and leadership portfolio.

MENT 730. Developing and Managing Your Professional Image. 3 Hours.
This course is designed to raise student awareness of their professional image. Topics include professional perception, polishing professional image, adjusting to professional contexts, and professional image and social media.

MENT 746. Critical Decisions in Mentoring & Leadership. 3 Hours.
This course explores the critical thinking skills related to the decision making processes for mentors and leaders.

RECM-Research Communication Courses

RECM 701. Presentation and Discussion Skills. 3 Hours.
Develops professional communication skills, including public speaking skills, conversation management, adapting to audience, and overall comprehensibility. Presentations critiqued by self, peers, and instructor.

RECM 707. Presenting Effectively. 1 Hour.
Provides an overview of giving effective oral presentations in academic and professional settings. Topics include analyzing audience and purpose, characteristics of an effective delivery, strategies for planning and design, handling questions and answers, boosting confidence, and using technology in presentations. One-day workshop.

RECM 708. Writing Successfully. 1 Hour.
Addresses issues involved in writing for academic and professional settings. Topics include analyzing audience and purpose, addressing common writing problems, developing effective writing practices, writing for publication, communicating research to the general public, and productivity strategies for writers. One-day workshop.

RECM 722. Writing Research for Broad Audiences. 3 Hours.
Introduces students to effectively writing about research for broad audiences, including the media, policy makers, and general public. Students learn to write various genres of texts, such as blog posts, press releases, letters-to-the-editor, and feature articles.

RECM 727. Writing & Reviewing Research. 3 Hours.
Introduces writers to research writing "best practices," criteria for evaluating writing, plus editing and peer review. Writers analyze and write short, strategic texts (on their own topics) in 5 research genres – critiques, annotated bibliographies, introductions, empirical, and review articles – based on peer and instructor feedback, for a draft presentation or proposal. For anyone writing course papers, theses, and/or proposals.

RECM 729. Writing a Journal Article in 12 Weeks. 3 Hours.
Introduces writers to a systematic approach to writing a journal article, including essential structures, stylistic conventions, and smart strategies for planning and completing projects under a deadline. Writers begin with their own working manuscripts (unpublished course paper, thesis, dissertation, etc.), identify a target journal, and draft short, strategic sections, based on peer review and instructor feedback, to create a final submission, per author's guidelines. For anyone with active publishing goals.

RECM 739. Research Communication Portfolio. 3 Hours.
This Science Communication Portfolio course focuses on the student's compilation of course experiences in key areas, such as science journalism, science public relations, medical writing, and entrepreneurship.

RECM 745. Communication and Diversity Leadership. 3 Hours.
Upon completion of the course, students will be able to explain, analyze, and apply approaches to leading and communicating in diverse communities.

RECM 749. Improvisational Techniques to Improve Leadership, Teaching and Research Communication. 1 Hour.
This workshop engages participants through improvisational and theatrical techniques in order to build confidence and improve as leaders, teachers, and/or researchers.

RLM-Research Lab Management Courses

RLM 773. Research Lab Management. 3 Hours.
By successfully completing this course, enrolled participants should be able to i) construct a start-up budget; ii) design a safe research laboratory environment; iii) hire, mentor and manage research lab staff and trainees; and iv) develop and implement a research lab management plan. Submission of a completed research lab management plan will be used to measure attainment of learning objectives.

RLM 774. Introduction to Regulatory Compliance. 1 Hour.
Enrolled participants will examine regulatory compliance issues related to basic research needs, including but not limited to animal use, human subjects and export control. Completion of in-class activities will be used to measure attainment of learning objectives.

RLM 775. Research Lab Safety. 1 Hour.
Enrolled participants will examine general laboratory safety practices and should be able to i) design a safe laboratory plan; and ii) develop lab safety-related standard operating procedures. Completion of in-class activities will be used to measure attainment of learning objectives.

Office of Professional Studies and Experiential Learning

Program director:	Carmel McNicholas-Bevensee
Phone:	(205) 934-1785
Email:	cbevense@uab.edu
Website:	https://www.uab.edu/graduate/students/current-students/career-development/opsel

OPSEL Information

OPSEL courses, seminars and workshops are offered to improve the academic and professional communication skills of graduate students, postdoctoral fellows, faculty, and staff with the goals of supporting scholarship, research integrity, productivity, effective communication, mentoring and leadership, college teaching, and the development and refinement of professional skills.

Those interested in pursuing the Interdisciplinary Graduate Studies (IGS) degree (MA or MS) will find information about the program and how to apply on the IGS webpage at: Master of Arts and Master of Science in Interdisciplinary Graduate Studies - Graduate School | UAB

Similarly, individuals interested in pursuing any of the following graduate-level certificates through OPSEL will find more information about the programs and how to apply at: Office of Professional Studies and Experiential Learning - Graduate School | UAB

Upon completion, graduate certificates earned through OPSEL will appear on official UAB transcripts. For more information regarding the course requirements click on the hyperlinks below.

Interdisciplinary Graduate Studies – *MS and MA degrees available*

UAB offers two master's degrees in Interdisciplinary Graduate Studies (IGS): The Master of Arts and the Master of Science. Both IGS degrees are designed to provide students with opportunities to blend two areas of expertise in order to best meet the needs of contemporary hybrid careers. The IGS degree allows students to personalize a master's degree to align with their professional, academic, and personal goals. Students may choose to combine any two (2) UAB graduate certificates that have affiliated with the IGS program in order to gain knowledge and skills they want as they seek professional advancement or personal development.

Academic Advising - *Certificate available*

The graduate certificate in Academic Advising (**AADV**) is designed to provide current and prospective academic advisors with opportunities to gain knowledge, skills, and competencies required to advance their

academic advising practices in manners that best support students in their academic success and persistence towards degree completion. Scholars who complete the Academic Advising graduate certificate will display their knowledge of and ability to apply desirable competencies within, yet not limited to, individual advising and academic support sessions and group advising sessions as well as environments associated with appreciative admissions, orientation, academic transitions, major discoveries, and career preparations. Courses in the AADV graduate certificate program are offered in the standard letter grading format and may be incorporating into the IGS degree. The program is also available as a track in the Master of Science in Higher Education Administration.

Diversity, Equity, Inclusion, & Advocacy - *Certificate available (email:* DiversityEd@uab.edu (inclusion@uab.edu)*)*

The graduate certificate in Diversity, Equity, Inclusion, and Advocacy (**DEIA**) is designed to provide learners with opportunities to gain knowledge, skills, and competencies associated with advancing personal, social, and cultural initiatives to combat interpersonal and systemic inequities as well as foster cultures of inclusion and justice. Learners who complete the DEIA graduate certificate will display their knowledge of and ability to apply desirable competencies within, yet not limited to post-secondary education institutions, civic engagement, nonprofit, and politically minded organizations, health care providers, as well as the business and industry sectors. Courses in the DEIA graduate certificate program are offered in the standard letter grading format and may be incorporating into the IGS degree.

Leadership & Professional Development - *Certificate available*

The **LEAD** certificate is designed to provide students with opportunities to master leadership and professional development competencies. The dynamic nature of today's society and economy requires us all to think critically, communicate effectively, and transfer skills into multiple environments. LEAD facilitates learning and competencies required for academic, career, and personal success. Courses in the LEAD graduate certificate program are offered in the standard letter grading format and may be incorporating into the IGS degree.

Mentoring & Leadership - *Certificate available*

The**Mentoring and Leadership**#certificate is designed to provide students with opportunities to build strong mentoring and leadership skills while exploring what it takes to be a mentoring leader. The certificate offers courses in mentoring, leadership, communication skills, and more.

Courses in the Mentoring and Leadership graduate certificate are offered in the pass/no pass grading format.

Research Communication - *Certificate available*

The graduate certificate in Research Communication (RECM) is a graduate-level credential that is designed to provide foundational knowledge and applicable experience in effective communication of research and key research findings to academic audiences, professional audiences, and to the general public across different communicative platforms. The RECM certificate focuses on developing current UAB graduate students, postdoctoral fellows, faculty, and employees in both science and non-science fields to learn how to effectively communicate research and research findings. The certificate offers courses in presentation and discussion skills, academic writing, grant writing, writing for broad audiences, and more. Courses in the RECM graduate certificate program are offered in the Pass/No Pass as well as standard letter grading format. The standard letter grade format courses may be incorporated into the IGS degree.

Research Laboratory Management - *Certificate available*

The **Research Laboratory Management** certificate prepares graduate students, postdoctoral fellows, faculty and staff, who are engaged in science-related research, to effectively lead and manage all aspects of an active scientific laboratory. Managing laboratory needs, such as budgetary and regulatory / safety compliance, is essential for career success in today's research marketplace. Courses in the Research Laboratory Management graduate certificate are offered in the pass/no pass as well as the standard letter grading formats. Graded courses may be incorporated into the IGS degree.

Teaching at the College Level - *Certificates available*

UAB offers two CIRTL graduate certificates designed to provide you with opportunities to improve your teaching. Graduate students, postdoctoral fellows, faculty, employees, and community members are welcome to take one or more CIRTL courses. CIRTL@UAB is part of the Center for the Integration of Research, Teaching and Learning (CIRTL) Network. Built around the core values of Learning through Diversity, Teaching as Research, and Interdisciplinary Learning Communities, CIRTL is dedicated to preparing the next generation of college faculty. UAB offers two CIRTL certificates:

1. CIRTL Practitioner (15 credits) requires courses to help you gain teaching skills to prepare learners to develop, deliver, and assess learning opportunities for diverse populations.
2. CIRTL Scholar (21 credits) builds on the Practitioner certificate and guides participants in developing and implementing a Teaching-As-Research (TAR) project to enhance teaching effectiveness. If you choose to complete the CIRTL Scholar certificate, you will also be awarded the CIRTL Practitioner certificate.

Admission to the Certificate Programs

Current UAB graduate students - fill out and submit the "Intent to Pursue" form located on each of the certificate's webpage.

For new students – click here to complete the UAB Graduate School Application indicating which certificate you wish to pursue.

Registration

For more information on how to register for classes, visit https://www.uab.edu/students/academics/register-for-classes.

Graduate Certificate in Academic Advising

Requirements		Hours
Core Classes		
AADV 600	Academic Advising History and Practices	3
HEA 660	College Student Development	3
AADV 610	Assessment in Academic Advising	3
AADV 620	Diversity, Equity, Inclusion, and Advocacy in Academic Advising	3
Electives		**3**

AADV 630	Special Topics Seminar in Academic Advising
AADV 640	Special Topics Workshop in Academic Advising

Graduate Certificate in College Teaching - Practitioner

Requirements		Hours
GRD 705	Teaching at the College Level	2-3
GRD 716	Developing a Teaching Portfolio	2
GRD 750	CIRTL Seminar in Learning	2
GRD 751	CIRTL Teaching Methods	2
GRD 755	CIRTL Teaching Practicum	3
Elective Courses:		**5**
GRD/RECM 701	Presentation and Discussion Skills	
GRD/RECM 707	Presenting Effectively	
GRD/RECM 708	Writing Successfully	
GRD 713	Mentoring 101	
GRD/MENT 719	Introduction to Mentoring & Leadership	
GRD/RECM 727	Writing & Reviewing Research	
GRD 728	Professional Writing & Publishing	
GRD/RECM 729	Writing Your Journal Article in 12 Weeks	
GRD/MENT 730	Developing and Managing Your Professional Image	
GRD 733	Managing & Leading Teams	
GRD/RECM 745	Communication and Diversity Leadership	
GRD 747	Navigating the Job Market	
GRD/RECM 749	Improvisational Techniques to Improve Leadership, Teaching, and Research Communication	
GRD 754	Advanced Evidence-based Teaching	
GRD 766	Introduction to Online Teaching	
Total Hours		**16-17**

Graduate Certificate in College Teaching - Scholar

Requirements		Hours
GRD 705	Teaching at the College Level	2-3
GRD 716	Developing a Teaching Portfolio	2
GRD 750	CIRTL Seminar in Learning	2
GRD 751	CIRTL Teaching Methods	2
GRD 755	CIRTL Teaching Practicum	3
GRD 759	CIRTL Teaching-as-Research in STEM Courses	3
GRD 760	CIRTL Teaching-as-Research Project	3
Elective Courses:		**5**
GRD/RECM 701	Presentation and Discussion Skills	
GRD/RECM 707	Presenting Effectively	
GRD/RECM 708	Writing Successfully	
GRD 713	Mentoring 101	
GRD/MENT 719	Introduction to Mentoring & Leadership	
GRD/RECM 727	Writing & Reviewing Research	
GRD 728	Professional Writing & Publishing	
GRD/RECM 729	Writing Your Journal Article in 12 Weeks	
GRD/MENT 730	Developing and Managing Your Professional Image	
GRD 733	Managing & Leading Teams	
GRD 745	Communication and Diversity Leadership	
or RECM 745	Communication and Diversity Leadership	
GRD 747	Navigating the Job Market	
GRD/RECM 749	Improvisational Techniques to Improve Leadership, Teaching, and Research Communication	
GRD 752	Introduction to Evidence-based Teaching	
GRD 753	CIRTL Seminar on STEM Academic Teaching Careers	
GRD 754	Advanced Evidence-based Teaching	
GRD 756	CIRTL The College Classroom	
GRD 757	CIRTL Effective Use of Technology in Teaching and Learning	
GRD 758	CIRTL Diversity in the College Classroom	
GRD 761	CIRTL Special Topics	
GRD 762	CIRTL Individualized Seminar	
GRD 763	CIRTL Individualized Teaching and Learning Project	
GRD 765	CIRTL Individualized Teaching Experience II	
GRD 766	Introduction to Online Teaching	
Total Hours		**22-23**

Graduate Certificate in Diversity, Equity, Inclusion & Advocacy

Requirements		Hours
Core Courses		
DEIA 510	Diversity Policy Politics and Practice	3
DEIA 520	Equity and Inclusion	3
DEIA 530	Leadership in Social Justice Advocacy, Self and Others	3
DEIA 590	Engaged Scholarship in Diversity, Equity, Inclusion, and Advocacy	1-4
Electives		**3**
Total Hours		**13-16**

Certificate Leadership and Professional Development

Requirements		Hours
LEAD 500	Introduction to Leadership Behaviors, Characteristics and Theories	3
LEAD 520	Ethics in the Workplace	3
LEAD 540	Team Development and Dynamics	2
LEAD 590	Leadership by Design	2
Electives		**5**
LEAD 504	Introduction to Organizational Change Processes	
LEAD 541	Building Effective Teams	
LEAD 544	Conflict Negotiation in Leadership	
LEAD 545	Planning and Facilitating a Retreat	
LEAD 560	Leadership and Professional Development Workshop	
Total Hours		**15**

Graduate Certificate in Mentoring and Leadership

Requirements		Hours
GRD/MENT 719	Introduction to Mentoring & Leadership	3
GRD 735	Leadership 101	1
GRD 713	Mentoring 101	1
Choose ten (10) credit hours from the folloiwng electives:		**10**
GRD/RECM 701	Presentation and Discussion Skills	
GRD 705	Teaching at the College Level	
GRD 706	Grants and Fellowships 101	
GRD/RECM 707	Presenting Effectively	
GRD/RECM 708	Writing Successfully	
GRD 715	Preparing TAs to Be Effective Teachers	
GRD/RECM 727	Writing & Reviewing Research	
GRD 728	Professional Writing & Publishing	
GRD/MENT 730	Developing and Managing Your Professional Image	
GRD 733	Managing & Leading Teams	
GRD 734	Ethical Leadership Development	
GRD 744	Leadership Survival Skills	
GRD 745	Communication and Diversity Leadership	
GRD/MENT 746	Critical Decisions in Mentoring & Leadership	
GRD 747	Navigating the Job Market	
GRD 748	Faculty Mentoring in Higher Education	
GRD 749	Improvisational Techniques to Improve Leadership, Teaching, and Research Communication	
Total Hours		**15**

Graduate Certificate in Postdoctoral Professional Development

Requirements		Hours
Certficate Core Classes		
GRD 709	Writing Fellowships	3
GRD 717	Principles of Scientific Integrity	3
GRD 773	Research Lab Management	3
Certificate Electives		**6**
GRD/RECM 707	Presenting Effectively	
GRD 745	Communication and Diversity Leadership	
GRD/RECM 727	Writing & Reviewing Research	
GRD 719	Introduction to Mentoring & Leadership	
GRD 733	Managing & Leading Teams	
GRD/RECM 739	Research Communication Portfolio	
GRD 766	Introduction to Online Teaching	
INFO 601	Introduction to Bioinformatics	
MBA 681	From Idea to IPO	
MBA 683	Leading Innovation	
Total Hours		**15**

Certificate in Research Communication

Requirements		Hours
GRD/RECM 701	Presentation and Discussion Skills	3
GRD/RECM 722	Writing Research for Broad Audiences	3
GRD/RECM 739	Research Communication Portfolio	3
Electives		**8**
CM 603	Message Construction	
CM 604	Analysis of Communication Audiences	
EH 502	Writing in Popular Periodicals	
EH 503	Business Writing	
EH 504	Technical Writing	
EH 557	Writing and Medicine	
GRD 706	Grants and Fellowships 101	
GRD/RECM 707	Presenting Effectively	
GRD/RECM 708	Writing Successfully	
GRD 723	Writing Research for Academic Audiences	
GRD/RECM 727	Writing & Reviewing Research	
GRD/RECM 729	Writing Your Journal Article in 12 Weeks	
GRD/RECM 745	Communication and Diversity Leadership	
GRD/RECM 749	Improvisational Techniques to Improve Leadership, Teaching, and Research Communication	
MBA 616	Web Analytics	
Total Hours		**17**

Certificate in Research Lab Management

Requirements		Hours
Required Coursework		
GRD/RLM 773	Research Lab Management	3
MBA 631	Management and Organizations	3
GRD 706	Grants and Fellowships 101	1
GRD/RLM 774	Introduction to Regulatory Compliance	1
GRD/RLM 775	Research Lab Safety	1
Electives		**6**
MBA 601	Accounting and Finance for Managers	
MBA 681	From Idea to IPO	
GRD/RECM 701	Presentation and Discussion Skills	
GRD/MENT 719	Introduction to Mentoring & Leadership	
GRD/RECM 745	Communication and Diversity Leadership	
GRD/RECM 727	Writing & Reviewing Research	
Total Hours		**15**

MA/MS in Interdisciplinary Graduate Studies

Requirements		Hours
Certificate I [1]		12-21
Certificate II [1]		12-21
GRD/IGS 690	IGS Capstone: Research to Practice [2]	3
3.0 Overall GPA		
80% Standard Letter Grade Coursework Earning a Minimum Grade of "B."		
Minimum Hours (30 semester hours) [3]		

1 Grade of B or better required

2 At least 30 semester hours are required to complete the MA/MS in Interdisciplinary Graduate Studies

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Clinical Exercise Physiology (p. 286)
Clinical Informatics (p. 416)
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Diversity Equity Inclusion and Advocacy (p. 608)
Foundations of Business Administration
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Health Coaching
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Healthcare Simulation (p. 416)
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A

- AC-Accounting
- AH-Administration Health Services
- AH-Health Administration
- AHD-Administration Health Services DSc
- ANSC-Anatomical Science
- ANTH-Anthropology
- ARH-Art History
- ARS-Art Studio
- ASEM-Advanced Safety Engineering & Management

B

- BHS-Biomedical & Health Sciences
- BME-Biomedical Engineering
- BMEM-Biomedical Engineering
- BST-Biostatistics
- BT-Biotechnology
- BTR-Biotechnology & Regulatory Affairs
- BY-Biology

C

- CB-Cell Biology
- CD-Clinical Dentistry
- CDS-Clinical & Diagnostic Science
- CE-Civil Engineering
- CECM-Construction Engineering Management
- CESC-Sustainable Smart Cities
- CESE-Structural Engineering
- CH-Chemistry
- CHHS-Community Health & Human Services
- CJ-Criminal Justice
- CLS-Clinical Laboratory Science
- CM-Communication Management
- CPA-Clinical Pathologist Assistant
- CS-Computer Science

E

- Early Childhood Education
- ECG-Counseling, Human Service
- ECT-Collaborative Teacher Education
- ECY-Special Education
- EDA-Art Education
- EDC-Curriculum Education
- EDF-Foundations of Education
- EDL-Educational Leadership
- EDR-Reading Education
- EE-Electrical & Computer Engineering
- EEC-Elementary and Early Childhood Education
- EESL-English as a Second Language
- EGR-Engineering
- EH-English
- EHS-High School Education
- ENH-Environmental Health
- EPI-Epidemiology
- EPR-Educational Psychology
- ESP-Education School Psychometry

F

- FR-French
- FS-Forensic Science

G

- GBS-Graduate Biomedical Science
- GC-Genetic Counseling
- GER-Gerontology
- GHS-Global Health Studies
- GRD-Graduate School

H

- HB-Health Behaviour
- HCI - Healthcare Innovation
- HCS-Healthcare Simulation
- HI-Health Informatics
- HPO - Health Policy and Organization
- HQS-Healthcare Quality & Safety
- HRP-Health Professions
- HY-History

I

- IEM-Information Engineering Management
- IGS-Interdisciplinary Graduate Studies
- INFO-Bioinformatics
- IS-Information Systems

K

- KIN-Kinesiology

L

- LDLS-Learning Design & Learning Science
- LEAD-Leadership

M

- MA-Mathematics
- MBA-Master of Business Administration
- MBS-Multidisciplinary Biomedical Science
- ME-Mechanical Engineering
- MENT-Mentoring & Leadership
- MHP-Health Physics
- MIC-Microbiology
- MPA-Master of Public Administration
- MSE-Materials Science & Engineering

- MSEM-Engineering Management
- MSTP-Medical Science Training Program

N

- NA-Nursing-Nurse Anesthesia
- NAH-Nursing-Adult Health
- NBB-Nursing-Biobehavioral
- NBL-Neurobiology
- NCA-Nursing-Critical Care
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- NFH-Nursing-Family
- NGN-Nursing-Gerontological
- NHSA-Nursing-Health Administration
- NMD-Nursing-Diabetes Management
- NMT-Nuclear Medicine Technology
- NNE-Nursing-Neonatal
- NNI-Nursing-Informatics
- NOH-Nursing-Occupational Health
- NPA-Nursing-Palliative Care
- NPE-Nursing-Pediatrics
- NPN-Nursing-Psychiatric/Mental Health
- NPR-Nursing-Promotion/Protection/Restorative Health
- NRM-Nursing-Research Methods
- NST-Nursing Statistical Methods
- NTC-Nursing-Teaching
- NTR-Nutrition Science
- NUR-Nursing
- NWH-Nursing-Women's Health

O

- OT-Occupational Therapy

P

- PA-Physician Assistant
- PH-Physics
- PHR-Pharmacology
- PSDO-Physician Scientist Development
- PT-Physical Therapy
- PTC-Health Focused Patient/Client Management
- PUH-Public Health
- PY-Psychology

R

- RECM-Research Communication
- RHB-Rehabilitation Science
- RLM-Research Lab Management

S

- SOC-Sociology
- SPA-Spainsh
- SW-Social Work

T

- TMS-Translational & Molecular Science
- TOX-Toxicology

V

- VIS-Vision Science

Addenda

Graduate Certificate in Magnetic Resonance Imaging

Approved 12/8/23

New certificate to be added in the School of Health Professions in Clinical and Diagnostic Sciences.

Requirements		Hours
NMT 604	Introduction to Nuclear Medicine, Management, Patient Care & Lab	2
NMT 634	MRI Scanning and Sequence	2
NMT 695	MRI Clinical Practice	10
Total Hours		**14**

Graduate Certificate in Computed Tomography

Approved 12/8/23

New certificate to be added in the School of Health Professions in Clinical and Diagnostic Sciences.

Requirements		Hours
CDS 505	Professional Skills Development	1
NMT 605	Cross-Sectional Anatomy	2
NMT 625	CT Physics and Instrumentation	2
NMT 633	Computed Tomography Procedures	2
NMT 694	Computed Tomography Clinical Practice	3
Total Hours		**10**

English Language Education Concentration

Approved 6/14/2024

A new English Language Education Concentration has been added to the M.A.Ed in Educational Studies.

Requirements		Hours
Curriculum/Design Implementation Methods		**3**
Select one of the following:		
ECT 521	IEP Programming and Lesson Planning	
EDC 651	Innovative Practices in Instruction	
EDR 551	Reading in Content Areas	
EEC 612	Models of Teaching	
ECE 620	Introduction to Curriculum and Teaching in Cultural & Familial Contexts	
EESL 512	Curriculum, Program, Policies	
EESL 612	Curriculum, Programs and Policies	
EESL 637	Methods Teaching English as an International Language	
KIN 511	Elementary School Physical Education	
Assessment and Measurement		**3**
Select one of the following:		
ECT 520	Formative and Summative Assessment	
EESL 657	Instruction and Assessment: Listening and Speaking	
EPR 510	Measurement and Evaluation in Education ECE	
EPR 511	Measurement and Evaluation in Education Secondary Ed	
EPR 594	Introduction to Educational Research Design	
KIN 509	Assessment in Physical Education	
Diverse Populations		**3**
ECT 523	Instructional Methods	
ECT 527	Collaborative Processes	
EDF 600	Urban Education	
EDF 602	Critical Social Issues in American Education	
EDF 606	Social Movements in Education	
EDF 616	Comparative Education	
EDF 620	Culture and American Education: Race Class and Gender	
EEC 540	Advanced Workshop in Education: Methods to Support English Learners	
EESL 513	Teaching ESL in a Multicultural Society	
EESL 613	Teaching ESL in a Multicultural Society	
EESL 617	Teaching English in a Global Context	
EHS 597	Special Problems in Education: Diversity	
KIN 649	Advanced Adapted Physical Education	
Special Education		**3**
ECY 600	Introduction to Exceptional Learner	
Core/Practicum/Capstone		**3**
Select one of the following:		
ECT 625	Positive Behavioral Supports	
EEC 674	Language Development	
EESL 510	Second Language Acquisition	
EESL 610	Second Language Acquisition	
EESL 525	Phonology for Second Language Teachers	
EESL 625	Phonology for Second Language Teachers	
EHS 556	Classroom Mgt in Sec Schools	
KIN 520	Fitness and Motor Skill Acquisition	
Concentration in English Language Education		**12**
Work with your advisor to select 12 credits from EH - English and/or EESL - English as a Second Language courses numbered 500+.		
Major Elective		**3**
Total Hours		**30**

Masters in Artificial Intelligence in Medicine

Approved as of June 2024 for addition to Catalog for Heersink School of Medicine

Requirements		Hours
HCI 611	Foundations of Artificial Intelligence in Medicine	3
HI 620	Security and Privacy in Health Care	3
AIM 641	Technical Introductions to Deep Learning in Medicine	3
AIM 642	Artificial Intelligence for Medical Imaging	3
AIM 643	Artificial Intelligence for Biomedical Signals and Critical Care Systems	3
AIM 644	Reinforcement Learning for Clinical Decision Making	3
AIM 645	Advanced Natural Language Processing (NLP) in Medicine	3
HCI 614	Integration of Artificial Intelligence into Clinical Workflow	3
HCI 613	Leadership and Ethics for Artificial Intelligence in Medicine	3
Optional Electives (Minimum of 2)		

	AIM 646	Large Language Model (LLM) Development in Medicine
	AIM 647	Explainable AI in Medicine
	EE 638	Neural Time Series Data Analysis
	EE 626	Digital Image Processing
	CS 680	Matrix Algorithms for Data Science
	CS 616	Big Data Programming
	CS 675	Data Visualization
Total Hours		**27**

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