



General Information

Date:	3/18/21	*Effective Term:	Fall 2021
College/Department:	Engineering/Computer Science		
Course Designator and Number (Cross-listed Course Designator and Number):	CS 5214		
Title of Course:	Modeling and Evaluation of Computer Systems		
Instructor and/or Department Contact:	Trey Mayo/Director of Graduate Programs		
Contact Phone:		Contact E-mail:	treymayo@vt.edu

Prerequisite Enforced

Enable prerequisite enforcement? Yes No

Add the following Prerequisite/Corequisites:

Graduate standing in the CSA program
Attach department letter of support to include a non-departmental course as a prerequisite/corequisite.

Drop the Following Prerequisites/Corequisites:

CS 5024

List Course Prerequisites/Corequisites after change:

Graduate standing in the CSA program

Justification (Justify prerequisite/corequisite changes and remaining prerequisites/corequisites after change)

CS 5024 course content has changed that no longer serves as the appropriate pre-req for CS 5124. UG statistics course has been removed as well requiring students to be admitted to CSA graduate program in order to take the course.
If adding a minimum grade as a prerequisite for a course, data must be provided to clearly show the need for that minimum grade in order to be successful in the course. Minimum grade requirements may not be used as a way to limit enrollment.

*If request is being processed for the upcoming effective term:

- Requests to **ADD** prerequisite requirements (i.e., turn enforcement **ON**, add grade restriction, add course) must be processed prior to the opening of "course request" for the applicable effective term.
- Requests to **REMOVE** prerequisite requirements (i.e., turn enforcement **OFF**, remove a grade restriction, drop course) may be completed at any time, unless the removal causes the course to be more restrictive.

Approval Signatures

Department Head/Chair		Date	3/18/2021
College Curriculum Committee Representative		Date	3/19/21
College Dean		Date	3/19/21

COMPUTER SCIENCE 5214
MODELING AND EVALUATION OF COMPUTER SYSTEMS
(ADP TITLE: MODELING EVALUATION)

I. CATALOG DESCRIPTION:

5214 MODELING AND EVALUATION OF COMPUTER SYSTEMS

An overview of modeling, simulation, and performance evaluation of computer systems, i.e., operating systems, database management systems, office automation systems, etc. Fundamentals of modeling, the life cycle of a simulation study, workload characterization, random number and variate generation, procurement, measurement principles, software and hardware monitors, capacity planning, system and program tuning, analytic modeling. Duplication of subject matter of (4214 and 4224). Maximum of 6 hours credit may be obtained from (4214, 4224, 5214);

Pre: 5024 and (Stat 4705 or 4714 or 4105); (3H,3C). II.

II. LEARNING OBJECTIVES:

Having successfully completed this course, the student will be able to (1) model a computer system and perform simulation, (2) develop an analytic model of a computer system and solve a problem, and (3) analyze, measure, evaluate, improve, and tune the performance of a computer system.

III. JUSTIFICATION:

Modeling, simulation, and performance evaluation are the essential subject matters which should be mastered by every computer scientist who deals with design and analysis of computer systems (i.e., operating systems, database management systems, office automation systems, etc.). Thus this course is appropriate for students who will be working in those areas.

One of the new core courses, 5024, has been added as a prerequisite to ensure a common background for students entering this course.

IV. PREREQUISITES AND COREQUISITES:

This course builds on the fundamental computer science concepts covered in 5024, Models and Analysis. The applied probability theory requirement will be satisfied with STAT 4705, 4714, or 4105.

V. TEXTS AND SPECIAL TEACHING AIDS:

Required text:

Balci, O. MODELING AND EVALUATION OF COMPUTER SYSTEMS.
Packet available at local copy center. iv, 314.

e. Programming (GPSS)	
f. Design of experiments	
g. Experimentation	
h. Credibility assessment	
3. Workload characterization	5%
4. Random number and variate generation	5%
5. Procurement	5%
6. Measurement principles	10%
7. Software and hardware monitors	7%
8. Capacity planning	10%
9. System and program tuning	8%
10. Analytic modeling	15%
	<hr/> 100%

VIII. CORE CURRICULUM GUIDELINES:

NA