

# Graduate Training Handbook

## Department of Plant Pathology

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### 1. **Guidance**

Each graduate student selects a Major Faculty Advisor before being accepted into the Department of Plant Pathology. In some circumstances (students with independent funding who chose to participate in lab rotations) a Major Advisor will not be established upon admission to the graduate program. In these situations, a Major Advisor should be chosen by the end of the second academic semester. The major advisor is the main student contact for information regarding all aspects of graduate education. The major advisor will also serve as the chair of the student's Graduate Supervisory Committee. Graduate students may have a Major Advisor who is located off-campus at one of the Research and Education Centers. A student working with an off-campus advisor will have an additional on-campus advisor to assist the student during completion of the coursework phase of their program. The on-campus advisor may also serve on the supervisory committee, either as a participating member or as a co-chair of the committee.

The Major Advisor has the responsibility to:

- Orient the student upon arrival on campus.
- Explain general graduate school and department requirements, and plan the student's program and coursework for the first semester.
- Explain all policies regarding graduate assistantships, and responsibilities and procedures within the department and laboratory.
- Assist with planning the thesis or dissertation research project.
- Assist with selecting members of the Supervisory Committee.
- Ensure that the student's Program of Study and thesis/dissertation research, as approved by the Supervisory Committee, are followed.
- Monitor and evaluate the student's academic progress and preside over periodic meetings with the student's supervisory committee.

The supervisory committee serves to direct and advise the graduate student throughout the program of study. This committee is selected by the graduate student in consultation with the major advisor usually prior to the end of the first semester in residence. Selecting members for the Supervisory Committee is an important process for the graduate student and the Major Advisor. The graduate student should be encouraged to visit potential committee members in their offices and labs to learn of the faculty members' interests and research, and to share their own interests with the faculty. The graduate student should also solicit feedback from other graduate students regarding the suitability of specific faculty as committee members.

The Supervisory Committee should:

- Meet prior to the end of the second semester in residence to discuss and approve the student's program of study and the proposed research project.
- Meet as appropriate (at least once annually) as a committee to evaluate the student's progress on coursework and research.
- Conduct the qualifying examination for students in a doctoral program.
- Conduct the final examination when the thesis or dissertation is completed.

Only regular members of the Graduate Faculty or Special Appointments may serve as members of a Supervisory Committee. If a minor is designated for any degree, the committee must include one member with a regular graduate faculty appointment as the representative for that proposed minor. Students pursuing two minors must appoint representatives for each minor area to the committee.

For the **M.S. degree** (with thesis) and **Master of Agriculture** option (non-thesis) a supervisory committee is composed of at least two members from the Graduate Faculty of the Department of Plant Pathology.

For **doctoral degrees**, the supervisory committee shall consist of no fewer than four members selected from the regular Graduate Faculty, at least two of whom will be from the Department of Plant Pathology, and at least one member will be selected from outside the department to serve as the external committee member. If a minor is designated, the supervisory committee will include at least one person from the Graduate Faculty to represent the minor field of study. This person may also be the external committee member. The external member of the committee should function, particularly during examinations, as a member who is independent of the immediate interest of the Department of Plant Pathology. The external member of the committee has the responsibility to represent the interest and function of the Graduate School and the total University in a broad context as distinct from that of the degree-granting department. Faculty holding a courtesy status in the Plant Pathology Department should not be used as the external member of the committee.

Each student will meet with his/her Major Advisor twice a year for a progress evaluation. This meeting is designed to ensure that students are aware of their performance expectations, faculty advisors are aware of the student's progress, and both the coursework and research are progressing satisfactorily. The student and advisor will each fill out a short evaluation form prior to the meeting (see Appendix A), and will discuss the results of the forms, as well as any other academic, research, or professional concerns that may arise.

## **2. Course Credits, Degree Requirements, and Curriculum**

Undergraduate courses (1000-2999) may not be used as any part of the graduate degree requirements. Up to six credits of upper division undergraduate courses (3000-4999) taken outside of plant pathology may be used for credit towards a graduate degree, only when taken as part of an approved graduate program. The grade earned must be B or better. Courses numbered 5000, 6000, and 7000 are graduate level. Courses numbered 7000 are primarily for advanced graduate students.

### **M.S., Plant Pathology**

- Minimum credit hours: 30 credits
- Credits may include up to 6 hours of PLP 6971 Research for Master's Thesis, and a minimum of 24 credits regular course work

- At least 50% of the required credits must be in the major field (exclusive of PLP 6971 Research for Master's Thesis)
- All course work, including thesis hours and transfer credits, must be completed during the seven years immediately preceding the date on which the degree is to be awarded
- Minimum registration in the final term for a thesis student is 3 semester hours of 6971 in the fall and spring semesters, or 2 in the summer

#### **M.S., Non-thesis**

- Minimum credit hours: 30 credits
- No more than 6 credits of S/U may be counted, and no credits of PLP 6971 may be used
- At least 50% of the required credits must be in the major field
- All course work, including thesis hours and transfer credits, must be completed during the seven years immediately preceding the date on which the degree is to be awarded

#### **Ph.D., Plant Pathology:**

- Minimum credit hours: 90 credits
- Up to 30 credit hours from an M.S. degree may be used toward the Ph.D, if approved by the Graduate School. (A letter of petition is required if the Masters degree is in a different discipline from the doctoral program; See the UF Graduate Handbook for additional stipulations)
- No more than 45 credits may be transferred, including those from a masters
- All work for the doctorate must be completed within 5 calendar years after the qualifying examination
- Minimum registration in the final term for a doctoral student is 3 semester hours of 7980 in the fall and spring semesters or 2 in the summer.

#### **Minors:**

- A minor in plant pathology for a master's degree will require a minimum of 6 credits of work in plant pathology; additional requirements are at the discretion of the plant pathology committee member, as representative of the minor department.
- A minor in plant pathology for a doctoral degree will require 12-24 credits plant pathology, or a minimum of 8 credits if two minors are chosen.

**\*Note:** Graduate School policies apply – the above information was taken from 2012-2013 University of Florida Graduate Catalog. The Graduate School policies are subject to change. Additional information pertaining to minimum credit hour requirements, residence requirements, and so on is available from the UF Graduate Catalog and the Graduate School website: <http://gradschool.rgp.ufl.edu/> Course schedules for each semester are available at: <http://www.reg.ufl.edu/soc/>

#### **Residence Requirements**

##### **Masters Degree:**

There is no specific residence requirement. Of the 30 credits required, no more than 6 semester hours may be taken elsewhere, and only courses with a grade of A or B may be transferred.

##### **Doctoral Degree:**

Per the UF Graduate Student Handbook, beyond the first 30 credits counted toward the doctoral degree, students must complete 30 credits enrolled at the University of Florida campus or at an approved

branch station of the University of Florida Agricultural Experiment Stations or the Graduate Engineering and Research Center.

## **PREREQUISITE COURSEWORK**

General requirements for admission of students to the Graduate School of the University of Florida are presented in the Graduate Catalog. Students entering a Graduate Program in the Plant Pathology Department are expected to have basic coursework in botany, microbiology, cell biology, genetics, chemistry, and biochemistry.

In addition to the basic knowledge areas, students are expected to have specified prerequisite coursework for their required plant pathology courses.

## **REQUIRED COURSES**

### **Required for M.S.:**

- General Plant Pathology (PLP 5005C, 4 credits)
- Three of the following four courses:
  - Plant Virology (PLP 6223C, 3 credits)
  - Bacterial Plant Pathogens (PLP 6241C, 3 credits)
  - Fungal Plant Pathogens (PLP 6262C, 3 credits) OR Fungal Biology (PLP6656, 4 credits)
  - Statistics (STA 6166, or equivalent, 3 credits)
- Three semesters of Colloquium in Principles of Plant Pathology (PLP 6921, 1 credit)\*\*
- Three semesters of Seminar in Plant Pathology (PLP 6931, 1 credit)\*\*

### **Required for Ph.D.:**

- General Plant Pathology (PLP 5005C, 4 credits)
- Plant Virology (PLP 6223C, 3 credits)
- Bacterial Plant Pathogens (PLP 6241C, 3 credits)
- Fungal Plant Pathogens (PLP 6262C, 3 credits) OR Fungal Biology (PLP6656, 4 credits)
- Statistics (STA 6166, or equivalent, 3 credits)
- At least one credit of supervised teaching (PLP 6940, variable credit)\*
- Four semesters of Colloquium in Principles of Plant Pathology (PLP 6921, 1 credit)\*\*
- Four semesters of Seminar in Plant Pathology (PLP 6931, 1 credit)\*\*

### **Recommended Electives in Plant Pathology (at least 7 credit hours must come from electives within Plant Pathology):**

- Host Parasite Interactions I (PLP 6502, 3 credits)
- Host Parasite Interactions II (PLP 6303, 3 credits)
- Epidemiology of Plant Disease (PLP 6404, 4 credits)
- Mycology (PLP6656C, 4 credits)
- Prof. Internship in Plant Disease Clinic (PLP 6942, 3 credits)
- Theory and Practice of Plant Disease Control (PLP 5102, 3 credits)
- Applied Disease Management (PLP XXXX, 3 credits)
- Plant Disease Diagnosis (PLP 6291, 3 credits)

- Applied Population Genetic Analysis of Microbes (PLP 6621C, 3 credits)
- Field Plant Pathology (PLP 6905, 1 credit) – Spring Break trip, odd years.
- Citrus Plant Pathology (PLP 5115C, 3 credits) – at CREC, Lake Alfred and by polycom, fall, even yrs.
- Supervised teaching (PLP 6940, variable credit, optional for MS students)\*

\* It is recommended that all students serve as a Teaching Assistant (TA) for at least one semester. Students may assist in the Fundamentals of Plant Pathology course (PLP 3002C), in the advanced Plant Pathology courses, or in an approved course in a related department, according to the student's experience. Students at RECs may assist in online or blended courses, in course development, or in other teaching-related projects to meet the Supervised Teaching requirement. Students receive credit in PLP 6940, Supervised Teaching (1-5 credits/ semester, depending on workload, with a maximum of allowable 5 credits) for each semester that they serve as a TA. Students should contact the professor in charge of the course at least one semester in advance of its offering so that the necessary preparations can be made. Teaching assignments will be made by the graduate coordinator/ academic support services coordinator in conjunction with the course instructor or project advisor.

\*\* M.S. students who elect to continue for a Ph.D. in the Department of Plant Pathology must complete four additional semesters of Colloquium and Seminar.

### **Schedule of Plant Pathology Graduate Courses**

This schedule is subject to change. Course schedules for each semester are available at:  
<http://www.registrar.ufl.edu/>

Fall, odd	Spring, even	Fall, even	Spring, odd	Summer
<b>PLP 5005C</b> <b>General Plant Pathology</b> PLP 6656C Mycology <b>PLP 6502</b> <b>Genetics of Host-Parasite Interactions I</b>	<b>PLP 6223C</b> <b>Plant Virology (module offered first half of term)</b> <b>PLP 6241C</b> <b>Bacterial Plant Pathogens (module offered first half of term)</b> <b>PLP 6262C</b> <b>Fungal Plant Pathogens (module offered second half of term)</b> PLP 6303 Host Parasite Intereactions II PLP 6621C Applied Population Genetic Analysis of Microbes	<b>PLP 5005C</b> <b>General Plant Pathology</b> PLP 6656C Mycology PLP 5115C Citrus Pathology	<b>PLP 6223C</b> <b>Plant Virology (module offered first half of term)</b> <b>PLP 6241C</b> <b>Bacterial Plant Pathogens (module offered first half of term)</b> <b>PLP 6262C</b> <b>Fungal Plant Pathogens (module offered second half of term)</b> PLP 6404 Epidemiology of Plant Disease PLP 5102 Theory and Practice of Plant Disease Control PLP 6905 Field Plant Pathology	

**Notes:** *PLP3002C Fundamentals of Plant Pathology* (offered annually each fall semester) is a pre-requisite for other Plant Pathology courses and can be taken as a graduate-level course (**PLP 5005C General Plant Pathology**) if not taken as an undergraduate student. Courses in **bold** are required for the M.S. and Ph.D. under the new Plant Pathology curriculum.

### 3. Research proposal

Every Plant Pathology graduate student is required to complete a Research Proposal during the first year of their degree program. MS students must complete the Research Proposal within the first 9 months and PhD students within the first 12 months. Initially, the student will select a research topic and explore the topic through a literature review and via discussion with his/her major advisor. The next step is to outline research questions, hypotheses, and plans in the form of a Research Proposal.

The written research proposal will be submitted to the committee in a grant proposal format. A sample format is given in Appendix B, based on a simplified USDA proposal, but other granting agency formats may be used. The committee will determine specific formatting requirements. A fully developed research proposal should also include a list of key duties to be performed by the student and a timeline to ensure that the student finishes his or her program in a timely fashion.

The literature exploration phase will require extensive literature searches. The following is a list of resources that may be helpful:

- The **UF Library System** houses a large number of references and provides services of all kinds: [www.uflib.ufl.edu/](http://www.uflib.ufl.edu/)
- **Google Scholar** is a good search engine that is publicly available: <http://scholar.google.com/>
- The **Web of Science** (<http://apps.webofknowledge.com/>) is an excellent search engine made specifically for academic sources.
- **Agricola** (<http://agricola.nal.usda.gov/>) is a service of the USDA that allows you to search agriculture-related literature.

Students should also become familiar with the reference-organization tool, Endnote Web. Endnote Web is online software that is provided to all UF affiliates to help organize literature citations and to create citation lists. For more details see: <http://web.uflib.ufl.edu/endnoteweb.html>

To use these search tools, you will need to be logged on to the UF network, either through a UF computer or via the VPN virtual login software. To learn more about VPN at UF: [http://net-services.ufl.edu/provided\\_services/vpn/anyconnect/](http://net-services.ufl.edu/provided_services/vpn/anyconnect/)

Upon completion of the written Research Proposal, the graduate student will present the proposal to his/her Advisory Committee. The proposal presentation will be open to the public. When a date and time have been selected, the committee chair will forward the information to the department secretary for announcement to the department. Where possible, it is recommended that research proposals be coordinated into the regular departmental seminar; however, special seminars may be used to accommodate timely scheduling of the proposal.

#### 4. Qualifying exam

A qualifying examination is required for all PhD students. The objective of this exam is to ensure that all students have comprehensive knowledge of the field of plant pathology, as well as specific knowledge appropriate to their individual research project. Students must have passed all required courses before taking the qualifying exam, but should take the exam within 2 years after starting their PhD studies. The exam will have a written and an oral part. If a supervisory committee member cannot be present at the qualifying exam, a faculty member with appropriate graduate faculty status in the same academic area may substitute for the absent committee member.

The written part will consist of:

1. A revised research proposal, including a literature review;
2. A written exam, developed and graded by the advisory committee members. The format and content of this exam are entirely at the discretion of the committee. This portion of the exam will be administered in sections, with each committee member administering his/her own section. The committee will coordinate the timing and duration of the individual sections; the entire written examination period must be completed within two weeks.

The written exam typically spans both general subject competencies and subject matter specific to the student's sub-discipline, including appropriate statistical methods, and detailed knowledge of a particular host-pathogen system. This exam is an opportunity for the student to synthesize and apply the knowledge gained through coursework and research, and usually forms the basis for the oral examination.

The oral part may consist of one or more of the following:

1. An oral presentation of the research proposal;
2. Open questions about plant pathology and related topics;
3. Questions about the research proposal and the general topic of the proposed research;
4. Follow-up questions, based on answers given on the written exam.

The oral examination will generally last 3-4 hours. During following deliberations, in the absence of the student, the committee will determine whether the student has passed all parts of the qualifying exam satisfactorily. Students may expect that the committee will evaluate the qualifying exam based on (but not limited to):

- Quality of the research proposal (originality, contribution to science, soundness of design and statistical analysis, feasibility, quality of the English text);
- Student's general knowledge and comprehension in the field of plant pathology and other disciplines related to the student's research;
- Student's ability to think critically, and formulate cohesive arguments;
- Student's ability to synthesize and apply information to novel problems or questions.

The committee will then discuss the results with the student immediately thereafter. The results of the qualifying examination, either successful or unsuccessful, must be filed with the Graduate School. The Admission to Candidacy form is typically used to indicate successful completion of the qualifying examination. If the student fails the qualifying exam, the Graduate School must be notified. A re-examination may be requested, but it must be recommended by the supervisory committee and approved by the Graduate School.

After passing the qualifying exam, the student can be admitted to candidacy, which requires the approval of the student's Supervisory Committee, the Department Chairperson, the College Dean, and the Dean of the Graduate School. The approval must be based on (1) the academic record of the student, (2) the opinion of the supervisory committee concerning overall fitness for candidacy, (3) an approved dissertation topic, and (4) the qualifying examination.

Between the qualifying examination and the date of the degree, there must be a minimum of two semesters, if the candidate is in full-time residence, or one calendar year if the candidate is on less than a full-time basis. All work for the doctor's degree must be completed within five calendar years after the qualifying examination or this examination must be repeated.

## 5. Thesis or dissertation requirements

The format of the thesis or dissertation is set by the UF Graduate School. For specific requirements see: <http://graduateschool.ufl.edu/graduation/thesis-and-dissertation>.

The section order required by the Graduate School is: title page, copyright page, dedication (if any), acknowledgments, table of contents, list of tables, list of figures, list of abbreviations (if any), academic abstract, chapters (**see below**), appendices (if any), list of references, biographical sketch.

The following chapters are required by the department:

- **Introduction.** Include the context of your work and its importance, a review of the relevant literature, and your overall objectives, research question, or hypothesis.
- **Chapters.** The data chapters of the thesis or dissertation should be written as submission-ready manuscripts. A minimum of 1 chapter for Masters and 3 for PhD are required. If a manuscript has been published, the chapter should refer to a reprint in the appendix, as described in the UF Graduate School formatting instructions. Chapters formatted as manuscripts should contain the following sections unless specifically formatted for submission to a journal with different formatting requirements: title, abstract, introduction, materials and methods, results, discussion, literature cited. See the following link for specific table and figure formatting instructions for the thesis or dissertation: <http://helpdesk.ufl.edu/application-support-center/graduate-editorial-office/format-requirements/>



- **Conclusions.** The final chapter must include a synthesis of findings across studies and present general conclusions and their significance to the field.

The student will provide members of their committee with complete and polished copies of the thesis or dissertation at least two weeks before the scheduled date of the final examination.

Each semester the Graduate School publishes deadline dates that include the dates for initial and final submission of theses and dissertations to graduate in a given semester:

<http://graduateschool.ufl.edu/files/editorial-deadlines.pdf>

These deadlines must be adhered to and they supersede the dates listed in the front section of the current Graduate Catalog.

## 6. Exit seminar and Final Examination

A final seminar and oral examination are required for all graduate students. The seminar will be open to the public, and will be scheduled by the graduate student to precede the oral examination; the public exit seminar should occur no more than eight weeks before the final examination. One hour should be scheduled for the public seminar, and up to 4 hours should be allowed for the examination. The examination is open to all graduate faculty members, but only official committee members sign the thesis/dissertation and are required to sign Final Examination Report.

This examination is designed to evaluate the following for the candidate:

- Have they demonstrated an ability to conduct original and scientifically valid research, as judged by their thesis?
- Can the student defend the hypotheses, methodology, results and interpretation/conclusions of the research?

*NOTE: The final examination is an academic proceeding, part of the student's academic record, and as such, is not open to other students or the general public. The deadline for taking the examination is set by the graduate school, and more information can be found at*

<http://www.graduateschool.ufl.edu/graduation/>.

This examination must be scheduled at least 2 weeks in advance of the desired date. Follow these steps when scheduling the examination:

1. The student must confer with the Advisory Committee Chair that all the requirements for the Ph.D./M.S. Degree have been met and that the thesis research is essentially complete.
2. The student must arrange with all Advisory Committee members a suitable date and time for the seminar and exam.
3. The student will coordinate the seminar and examination through Graduate Program Staff Assistant, and this exam will be held on the University of Florida campus in Gainesville or at a UF Research and Education Center.
4. When an exam date has been proposed, the Department Chair (or his/her representative) will check the student's file to determine whether all requirements have been met and send a confirmation to the student and advisor.
5. The student must submit a list of the committee members and the requested date and hour of examination to his/her advisor and to the Graduate Student Coordinator.
6. The student must arrange that a notification of the final examination be submitted to the Gainesville and Statewide faculty at least 2 weeks prior to examination.
7. The thesis, in edited or semi-final form, must be received by each member of the Advisory Committee at least 2 weeks prior to the examination.

8. All Committee Members must sign the “Report on Thesis Dissertation and/or Final Examination” form after a unanimous vote to pass the student.
9. The results from the final examination should be delivered to the Editorial Office, 284 Grinter Hall, no later than 4:00 pm of the specified deadline by the graduate school.  
(<http://www.graduateschool.ufl.edu/graduation/>)

# Appendix A. Progress Evaluation Form

Evaluation form for Plant Pathology Graduate Students at the University of Florida

**Student Form** (to be completed by the student prior to evaluation meeting)

<b>Student Name:</b>	<b>Date:</b>					
<b>Major Advisor:</b>	<b>Co-Advisor:</b>					
Start date: Date of PhD Candidacy (if applicable):	Evaluation period:					
Evaluation Scale:	1 (weak)	2 (needs improvement)	3 (satisfactory)	4 (strong)	5 (exceptional)	
<b>Area under review</b>	<b>Score</b>					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>n/a</b>
1. Planning, management, and organization of research activities						
2. Involvement in lab group & interactions with peers						
3. Initiative and independence						
4. Problem solving skills						
5. Intellectual engagement (reading & discussion)						
6. Ability to analyse data and synthesize concepts						
7. Productivity (papers, posters, presentations)						
8. Teaching/Training (including formal & informal activities)						
9. Communication						
10. Professionalism (decorum, respect, ethics)						

List courses and grades for this review period:

List research activities for this research period:

List goals for next review period:

**Evaluation form for Plant Pathology Graduate Students at the University of Florida**

**Advisor Form** (to be completed by the major advisor prior to evaluation meeting)

<b>Student Name:</b>	<b>Date:</b>					
<b>Major Professor:</b>	<b>Co-Supervisor:</b>					
Start date: Date of PhD Candidacy (if applicable):	Evaluation period:					
Evaluation Scale:	1 (weak)	2 (needs improvement)	3 (satisfactory)	4 (strong)	5 (exceptional)	
<b>Area under review</b>	<b>Score</b>					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>n/a</b>
1. Planning, management, and organization of research activities						
2. Involvement in lab group & interactions with peers						
3. Initiative and independence						
4. Problem solving skills						
5. Intellectual engagement (reading & discussion)						
6. Ability to analyse data and synthesize concepts						
7. Productivity (papers, posters, presentations)						
8. Teaching/Training (including formal & informal activities)						
9. Communication						
10. Professionalism (decorum, respect, ethics)						

<b>Advisor Comments:</b>
Research Progress:
Professional Progress:
Goals and Expectations for the next review period:
Additional Comments and Meeting Notes:

<b>Function</b>	<b>Name</b>	<b>Date</b>	<b>Signature</b>
<b>Major Advisor</b>			
<b>Student*</b>			

\*Signature does not necessarily imply agreement

## Appendix B. Sample research proposal outline

**MS or PhD PROJECT PROPOSAL**

**UNIVERSITY OF FLORIDA  
Department of Plant Pathology**

**Student Name:**

**PROJECT TITLE:**

**Proposal Date:**

**Expected duration of the project: from:\_\_\_\_\_ to: \_\_\_\_\_**

**Location(s) in which the project will be executed:**

**Supervisors and Committee members:**

	<b>Name</b>	<b>Department</b>	<b>Organization</b>
<b>Supervisor:</b>			
<b>Committee Members</b>	(1):		
	(2):		
	(3):		

**Other Collaborators:**

**Sponsoring agencies or financial acknowledgements:**

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### **I. SUMMARY OF PROBLEM DESCRIPTION AND OBJECTIVES (1 PAGE)**

- A. Overall goals and rationale
- B. Specific objectives and hypotheses

### **II. BACKGROUND (5-10 PAGES)**

- A. Literature review
- B. Problem statement and Justification
- C. Hypotheses and/or Research Objectives

### **III. METHODOLOGY (5-10 PAGES)**

- A. Objective 1:
  - 1. Research approach
  - 2. Data collection
  - 3. Statistical analysis
- B. Objective 2... (as above, for each research objective)
- C. Expected results
- D. Feasibility (including Expertise & Equipment)
- E. Detailed work plan



