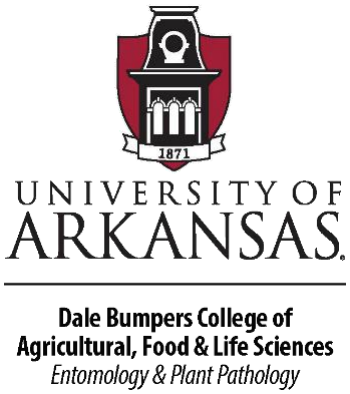
GRADUATE ADVISING HANDBOOK

for the

DEPARTMENT OF ENTOMOLOGY & PLANT PATHOLOGY



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I. STATEMENT OF PURPOSE

Students housed in the Department of Entomology and Plant Pathology (ENPL) can pursue:

- M.S. degrees in:
  - Entomology
  - Plant Pathology
  - Cell and Molecular Biology (CEMB)[1]
- Ph.D. degrees in:
  - Agricultural, Food, and Life Sciences [AFLS] with a concentration in Entomology
  - AFLS with a concentration in Plant Pathology
  - CEMB[1]

The purpose of this handbook is to define the ENPL Department's expectations of its graduate students and faculty mentors, and to provide both students and faculty with a roadmap for success in graduate degree completion. This document:

1) Identifies best practices for the creation and functioning of all students' mentoring teams;
2) outlines the general steps required for successful completion of all graduate degrees offered in the department;
3) defines the specific degree requirements for the M.S. programs in Entomology and Plant Pathology and the Ph.D. programs in AFLS with concentrations in Entomology and Plant Pathology.

In addition to this document:

- CEMB students should refer to the CEMB program's online guidelines for degree requirements (https://cell.uark.edu/) specific to their program.
- All graduate students should also consult the **University of Arkansas Graduate Student Handbook** for the university's guidelines for all students (https://graduate-and-international.uark.edu/graduate/current-students/student-support/student-resources/graduate-handbook/index.php), and the **University of Arkansas Graduate Catalog of Studies** (https://catalog.uark.edu/graduatecatalog/). A schedule of classes for each semester can be acquired online at https://uaconnect.uark.edu/

To maintain graduate standing, graduate students must comply with all policies, procedures and standards described by both the Graduate School and ENPL. The student is responsible for adhering to the regulations and deadlines outlined by the Graduate School Catalog, Student Handbook, and periodic university notifications (such as registration guidelines) as well as those stated in all Department policies.

[1] CEMB degrees are offered by the CEMB program, which is independent of any department.

II. GENERAL GUIDELINES FOR ALL GRADUATE STUDY IN THE DEPARTMENT

a. Overview: Major Milestones for Degree Completion

i. Important Milestones for all M.S. Students:

Milestone	Timeline
Identify a major advisor	Prior to entrance
Meet with advisor to discuss goals and expectations; develop a mentoring agreement	Within first week
Review university codes of conduct; complete a training in the Responsible Conduct of Research and Environmental Health and Safety trainings	Within the first month
Form an advisory committee (3 members) and submit the committee form	Within the first semester
Meet with the advisory committee	At least 3 times before graduation
Develop a curriculum plan approved by the advisory committee, and file this plan with the departmental office	Within the first semester
Give an entrance seminar	Within the first two semesters
Complete the annual review process with major advisor	Annually, by June 15
Review progress rubrics completed by advisory committee	After each annual advisory meeting, the entrance seminar, and the thesis defense
Complete the Teaching Assistant Orientation	Complete prior to the start of the second academic year (offered by university in August)
Complete teaching experience requirement (agreed upon with dept head)	Before graduation
Submit the thesis title form to the Graduate School	As soon as possible, no less than 4 months prior to graduation
Submit graduation form from this link: https://graduate-and-international.uark.edu/graduate/current-students/forms.php	March 1st, July 1st, or October 1st for SPR, SU, or FA
Confirm that the department has performed a Degree Audit with the Graduate School, and that all course requirements are met	At least one semester prior to graduation
Submit draft thesis to advisor	At least one month prior to defense
Submit thesis to advisory committee	At least two weeks prior to defense
Complete a thesis pre-check with the graduate school	At least 2 weeks prior to thesis defense
Give an exit seminar	Before or on the day of the thesis defense
Complete the thesis defense	At least 2 weeks before Graduate School deadline for thesis/dissertation submission
Revise thesis if needed to address committee and advisor feedback	Before submission of the thesis to the Graduate School
Obtain the advisor's and committee's signatures on the thesis title page and the Record of Progress form	After successful completion of the thesis and thesis defense
Submit the thesis packet to the Graduate School	See Graduate School Handbook for deadlines for the target semester

ii. Important Milestones for all Ph.D. Students:

Milestone	Timeline
Identify a major advisor	Prior to admission
Meet with advisor to discuss goals and expectations; develop a mentoring agreement	Within first week
Review university codes of conduct; complete a training in the Responsible Conduct of Research and Environmental Health and Safety trainings	Within the first month
Form an advisory committee (3 members) and submit the committee form	Within the first semester
Meet with the advisory committee	At least once per year
Develop a curriculum plan approved by the advisory committee, and file this plan with the departmental office	Within the first semester
Give an entrance seminar	Within the first two semesters
Complete the annual review process with major advisor	Annually, by June 15
Review progress rubrics completed by advisory committee	After each annual advisory meeting, the entrance seminar, and the thesis defense
Complete the Teaching Assistant Orientation	Complete prior to the start of the second academic year (offered by university in August)
Complete 2 semesters of TA service	Before graduation
Submit the thesis title form to the Graduate School	As soon as possible; no less than 4 months prior to graduation
Complete Candidacy Exam (written and oral portions); advisor will then notify the Graduate School (https://graduate-and-international.uark.edu/_resources/forms/candidacy-exam-notice.pdf)	At least 1 year prior to completion. Typically done at the end of Year 2.
Submit graduation form from this link: https://graduate-and-international.uark.edu/graduate/current-students/forms.php	March 1st, July 1st, or October 1st for SPR, SU, or FA graduation
Confirm that the department has performed a Degree Audit with the Graduate School, and that all course requirements are met	At least one semester prior to graduation
Submit draft dissertation to advisor	At least one month prior to defense
Submit dissertation to advisory committee	At least two weeks prior to defense
Complete dissertation pre-check with Graduate School	At least 2 wks prior to thesis defense
Give an exit seminar	Before or on the day of the dissertation defense
Complete the dissertation defense	At least 2 weeks before Graduate School deadline for thesis/dissertation submission
Revise dissertation if needed to address committee and advisor feedback	Before submission of the thesis to the Graduate School
Obtain the advisor's and committee's signatures on the dissertation title page and the Record of Progress form	After successful completion of the thesis and thesis defense
Submit the thesis packet to the Graduate School	See Graduate School Handbook for deadlines for the target semester

b. Code of Conduct

ENPL expects all of its members to follow the University of Arkansas's codes of conduct, including its Academic Integrity Policy (https://honesty.uark.edu/policy/index.php), the Code of Student Life (https://honorscollege.uark.edu/academics/academic-resources/academic-integrity-and-the-code-of-student-life.php), and university guidelines for Research Integrity and Compliance (https://rsic.uark.edu/other/responsible/index.php). Within their first month of joining the department, all new graduate students (and faculty) should review these guidelines, and also complete training in the Responsible Conduct of Research offered through the Collaborative Institutional Training Initiative (CITI) at https://about.citiprogram.org/course/responsible-conduct-of-research-basic/. Be sure you are logged into your computer with your UARK or UADA email. Click on login, using the SSO-enabled login so you do not need to register. Here is the guide to getting started https://support.citiprogram.org/s/article/updated-guide-to-getting-started

Graduate students are involved in research, the student may sometimes be responsible for sharing data or materials or negotiating with other institutions, industries, or individuals in relation to research funds, supplies, or services. Their communications with such individuals should be conducted with full approval of the faculty advisor and with an understanding of university policies and regulations.

Failure to adhere to the university's codes of conduct can in some cases result in immediate termination of the graduate assistantship and dismissal from the graduate program.

c. The Selection, Structure, and Responsibilities of the Mentoring Team

i. Major Advisor: Prospective M.S. and Ph.D. students typically identify potential advisors during or prior to the application process. Students are admitted to a graduate program only after one or more faculty have agreed to serve as a mentor, and to provide financial support for the student's stipend and tuition. After admission to the Graduate School and the degree program, the student is formally assigned to a major professor by the program coordinator (for the CEMB program) or by the department head (for all other degree programs in ENPL), with the mutual agreement of faculty and student.

Responsibilities of the Major Advisor: The major professor assists the student in choosing a graduate research projectand provides feedback and advice on a frequent and consistent basis throughout the student's graduate program. The major professor must approve all course work and review the progress of the student regularly, and also provides mentoring in professional development. The advisor must approve the student's thesis/dissertation before it is submitted to the advisory committee and should examine the final copy of the thesis/dissertation that is submitted to the Graduate School before affixing their signature to denote approval of the quality of the research, scholarship, and literary quality of the document. If, at any point in the degree process, the student's progress does not meet the advisor's expectations, the advisor is responsible for providing feedback and developing a plan for remediation.

ii. Advisory Committee: The student will meet with the major professor within their first semester to identify appropriate candidates to invite to serve on the graduate advisory committee. Students should take an active role in the selection and invitation process. For M.S. students, the committee will consist of **at least three** graduate faculty members including the major professor, and should

include **at least one** member from a relevant field outside of the student's specialization (ie. outside entomology for ENTO students, and outside plant pathology for PLPA M.S. students). For Ph.D. students, the committee will include at least 4 members, with at least one outside member from another department. For both M.S. and Ph.D. students, the Head of the Department will be an addition *ex-officio* (by virtue of office) member of all committees.

Before being finalized, the committee composition will be approved by the Head of the Department, and the committee form (available at https://graduate-and-international.uark.edu/graduate/current-students/forms.php) will then be sent to the Graduate School for approval by the Dean of the Graduate School. This should be completed in the first semester of a graduate student's program. Should the student and advisor wish to change the composition of the committee, the form must be completed again and filed with the department office and Graduate School.

At a minimum, the Advisory Committee will meet at least 3 times before graduation, and the student will inform the departmental administrative manager when this meeting takes place. However, students are encouraged to hold more frequent committee meetings and/or to meet individually with Committee members throughout the degree program to seek advice on research and other aspects of professional development.

Responsibilities of the Advisory Committee: The student's committee serves both as an advisory committee for the student's graduate program**,** the candidacy examination committee (for Ph. D. students), and the committee for the thesis/dissertation defense. This committee plays an advisory role for both student and faculty mentor. A member of the advisory committee may serve to advise the student in a special area of expertise and can coordinate portions of the student's research in agreement with the major professor**.** The student should seek the help of any member of the committee whenever it becomes desirable during the course of study. Any major changes in the course work or research will be done in consultation with the committee members. The signature of a member of the advisory committee on the student's thesis/dissertation indicates that the committee member believes the quality of both the research and the thesis/dissertation meets the standards of the University of Arkansas and merits the sought-after degree (M.S. or Ph.D).

iii. The Department Head: The Department Head serves as an *ex-officio* member of all committees, and conducts an oral exit interview with all graduate students as they finish their degrees.

Responsibilities of the Department Head: The Department Head is the chief executive for the faculty, staff and students in the department. As a member of the advisory committee, the department head may advise any committee member, the major professor, or the student in regard to quality of the student's performance. When necessary, the department head can also mediate conflicts between students and advisors.

iv. Changes to the Mentoring Team:

As students' projects evolve, their advising needs may change. To revise their committee composition, students must complete a Graduate School form and obtain the signatures of the members who are leaving or joining the committee, as well as the signature of the major advisor. This form should also be completed if a faculty member on the committee leaves the university or dies.

It is in some cases also possible for students to transfer to a different major advisor. Students and

advisors are encouraged to meet frequently, especially during the first year of study, and to evaluate the success of their mentor/mentee relationship on a regular basis. If, after these discussions, the student and/or advisor believe that their relationship is not a good fit, they should inform both the department head and the degree coordinator as soon as possible. The department head is available help mediate conflicts; in addition, depending upon the availability of alternative funding, the department head and degree coordinator may have the option to transfer the student to another advisor. The department also follows the Graduate School's grievance policy and procedures, which are available at:
https://catalog.uark.edu/graduatecatalog/objectivesandregulations/#grievanceproceduresteXt

d. The Degree Plan

I. *Mentoring Plan:* On arrival, the student and major advisor will meet to discuss the student's educational and career goals and the major advisor's expectations of and responsibilities to advisees. Based on this discussion, mentor and student will draft a mentoring plan (see Appendix 1 for a suggested template). Some examples of topics that should be covered in this onboarding session include:

- The work expectations, teaching responsibilities, and minimum GPA required for the student's assistantship
- The expected hours of work, typical work conditions, and expected metrics of productivity in the advisor's laboratory
- The division of labor and responsibilities within the laboratory
- The frequency and format of meetings between advisor and advisee
- The standard procedures for how students will seek and receive feedback on their plans and progress in research and academics
    - While this will vary depending upon the student needs and advisor availability, advisors and advisees are recommended to meet at least once a month, if not more frequently, to review student progress and future plans.
- The professional development opportunities available within the laboratory, including participation in conferences, opportunities and expectations for publication, and other training.

After this discussion, the mentor and student will date a mentoring plan and send it to the departmental administrative manager. Appendix 1 provides a template for this agreement, although each advisor may have a customized agreement.

Faculty and students are advised to revisit the mentoring plan annually during the annual progress check to assess whether it is working well and/or needs to be updated.

II. **Curriculum Plan:** The major professor will, at the earliest opportunity, call a meeting of the student and committee. To establish a course of study, the student will present a tentative outline of the course work (including a minimum of 24 course hours and six thesis hours). After making any revisions to this plan required by the committee, the student and the major professor will complete an outline of the student's plan of study and forward it to the departmental administrative manager and members of the graduate committee by the end of second semester at the latest.

iii. **Research Plan:** With guidance from their advisor, the student should draft a written research proposal including the rationale, objectives, and procedures, and share it with their advisory committee by the end of the first semester. The committee will provide feedback on the draft

proposal, and may potentially require revision and re-review prior to approval. The student should obtain committee approval for the revised proposal by the end of the second semester. The finalized plan should be forwarded to the director of the graduate program and to members of the graduate committee for their files.

By the 3rd semester, the student and mentor should also revisit the research plan and use it as the basis to develop a tentative plan for publishable units. Although of course no plan can be finalized until data collection and analysis is complete, this is a good time to discuss topics such as 1) which experiments could potentially be grouped for publication; 2) how to identify which journals are appropriate for the project; 3) how much data is typically needed for the target journals; 4) what type of literature reviews would be helpful for the introduction sections; and 5) what format students should use to draft their Materials and Methods sections.

iv. **Entrance Seminar:** Within the first two semesters, the student will give a brief seminar (~25 min) to the full department describing their planned thesis research. The student's Advisory Committee typically attends this seminar as well. The entrance seminar allows students to receive feedback and suggestions from the department at large. It also helps department members familiarize each other with their research interests in order to identify potential areas for cooperation and collaboration. Students should enroll in ENTO 6071 or PLPA 5001 in the semester they plan to give their entrance seminar. Students should also work closely with their advisors to develop and practice their presentation before delivering their presentation to the department.

e. Student Progress Checks and Program Assessment

I. *Annual Student Progress Check*

1. *Student Report:* It is the policy of the Graduate School that annual graduate student progress checks are conductedby each Degree Program Annually, by May 31, every student should provide their advisor and their committee with a brief written report detailing their progress in academics and research. The template for this report is provided in Appendix 2. This report should include a list of courses completed, grades, publications, presentations, awards, service positions, and other major outputs such as teaching, extension, and outreach activities. It would also include a brief description of research progress (typically ≤1 page) and plans for the coming year, including any changes in plans for coursework or research. Major changes in the student's coursework or research plan must be done in consultation with the committee members.
2. *Progress Check Forms*: The student report template (Appendix 2) also has questions for the faculty advisor to provide feedback on the student's progress and plans. In addition to this written feedback, the faculty advisor will fill out the Graduate School's annual academic review form for M.S. or Ph.D. students (https://graduate-and-international.uark.edu/graduate/current-students/forms.php). By June 15, the advisor will meet with the student (face-to-face if at all possible) to discuss the student's progress, both advisor and student will sign the Graduate School form, and both the report and the form will be forwarded to the advisory committee, the review coordinator (i.e. the chair of the graduate program), and the departmental office. The chair of the appropriate graduate program will review this evaluation, sign it, and meet with the department head to discuss all evaluations in the department, and then the department

will submit the Graduate School form to the Graduate School no later than **June 30.**

a. *Components of the Evaluation:* On the Graduate School's academic review form, the major advisor must indicate whether or not the student is making suitable progress towards degree completion. In addition, advisors are strongly recommended to provide specific written feedback on the student's annual performance and on goals and priorities for the coming year. The annual progress check covers all aspects of the student's degree progress, including coursework, research, writing, teaching, seminar participation, and adherence to professional codes of conduct.

b. *Process in the Case of Unsatisfactory Progress*:

Consequences of Unsatisfactory Progress. If, during the annual evaluation, or at any other time in the year, the major advisor, graduate coordinator, and department head determine that that the student is NOT making adequate degree progress, the student will be placed on probation by the department.

Recommended Remediation Process. When an advisor determines that a student is not making adequate progress, he or she should inform the graduate coordinator and department head, and should meet with the student promptly (typically within two weeks) to discuss the matter. Together, the advisor and student should form an action plan as soon as possible (no later than one month after the initial decision) to rectify the student's performance. The plan should provide specific deadlines for key activities, define the expected outcomes required for success, and set a schedule for follow-up meetings to check on progress. The advisor should share this plan with the advisory committee, graduate coordinator, and department head. The timeline for remediation will vary depending upon the nature and severity of the problem, but the advisor will provide written feedback at least once a month on whether the student is meeting the requirements of this plan. At the end of the agreed-upon probation period, the advisor, graduate coordinator, and department head will meet to discuss the student's progress and decide on a path forward. Failure to achieve adequate progress may result in dismissal from the advisor's laboratory and (if relevant) termination of the student assistantship.

Failure to meet with the advisory committee annually or provide documentation of the annual evaluation will also be interpreted as lack of progress toward completion of a degree and **may** result in termination of an assistantship appointment for the following year.

Departmental Process for Student Recourse: In the case of a negative review, the student has the option of submitting a response or rebuttal. This would consist of a memo to the department head and graduate coordinator that outlines why the student feels they have made adequate degree progress. Typically, the advisor would be cc'd on this memo, but the student may choose not to do so if they fear retaliation. Students may also choose whether or not to share the memo with their advisory committee. The department head and graduate coordinator will meet separately with student and advisor and develop a plan for conflict resolution.

II. ***Assessment of Effectiveness of Degree Programs:*** State legislation and the Arkansas Department of Higher Education (ADHE) require each department to have an educational assessment plan that defines the key skills their degree develops and that measures the effectiveness of their programs in improving these skills in their students. Departments must assess student growth over the course of the degree program in order to demonstrate that their degree programs are achieving ***quantifiable growth in students' skills and knowledge***. Whereas the goal of the annual review is to assess the student, the primary goals of this assessment are to assess the degree program, and inform departmental improvements to our programs. However, this process should also provide students with helpful feedback and guidance, and particularly provide a mechanism for the advisory committee to give the student formal feedback.

III. ***Assessment of Learning Objectives:*** To fulfill this responsibility and also provide the student with constructive feedback, the graduate advising committee will fill out a two-part form focused on background knowledge, oral communication, written communication, and problem solving/critical thinking (See Appendix 3) at three points during the student's degree progress:

- at the student's entrance seminar to assess the oral presentation and the associated written research proposal.
- at the mid-point of the student's degree program (the qualifying exam in the case of Ph.D. students, and the end of the first year in the case of M.S. students)
- at the time of the thesis- or dissertation defense

On Part 1 of the form (shared with the student and the advisor), the committee provides the student with constructive written feedback. On part 2 of the form (submitted to the departmental office), the committee assesses whether the student is showing adequate growth in skills and attaining the degree program's learning objectives.

Faculty and students should note that the hoped-for outcome on these rubrics is not perfect scores, but rather, progress over time.

Exit Interviews: The department head will have an **oral exit interview** with each graduating student to seek their feedback and collect information on their employment plans.

f. Theses and Dissertations

All graduate students in the department are expected to:

a. file a thesis or dissertation title with the Graduate School as soon as possible (at least 4 months before graduation for M.S. and at least 1 year before graduation for Ph.D.)

b. write and a thesis (for M.S.) or dissertation (for Ph.D.) that is prepared according to the Graduate School guidelines (https://graduate-and-international.uark.edu/graduate/current-students/thesis-dissertation-info/index.php). The complete draft of the thesis or dissertation should be provided to the faculty advisor at least 1 month before the proposed defense, and a draft approved by the advisor should be provided to the Advisory Committee at least 2 weeks before the proposed defense. Students should also send an electronic copy for a pre-check by the Graduate School at least 2 weeks in advance of the defense (https://graduate-and-international.uark.edu/graduate/current-students/thesis-

dissertation-info/precheck-process.php).

c. give an exit seminar on the thesis or dissertation that is open to the public and announced to the full department and graduate school at least 2 weeks in advance. The Graduate School provides an announcement form for Ph.D. students (https://graduate-and-international.uark.edu/graduate/current-students/dda-form.php), and the office can assist in sending out department-wide announcements for both M.S. and Ph.D. students. Students are recommended to schedule their defense at least two weeks prior to the submission deadline for the semester in which they wish to graduate. This allows time for editing the thesis to address committee feedback.

Students are also strongly encouraged to give their exit seminars as part of the departmental seminar series. Because seminar series are scheduled during the preceding semester by a committee chair selected on a rotating basis, the student should contact the departmental office one semester in advance to notify the seminar chair of their intent to graduate. The seminar chair will then work with the student to identify a seminar date that can accommodate the student's committee.

d. defend the thesis or dissertation in an oral examination with their guidance committee. This serves as the comprehensive exam mentioned on the Graduate School's Record of Progress Form. Students should consult with their advisory committee at least a semester in advance for advice on preparing for their thesis- or dissertation defense.

e. Revise the thesis or dissertation according to feedback from the committee, and submit the finalized document approved by the committee to the Graduate School.

Students are encouraged to publish as much as possible of their thesis or dissertation work prior to graduation. Ph.D. students are strongly encouraged to draft their first manuscript before their qualifying exam. With the approval of the advisor and advisory committee, publications on which the student is the lead author can serve as thesis or dissertation chapters. If the publication includes authors other than the student and the advisor, the chapter should contain a statement outlining the contributions of each author. Manuscripts that will be included in the thesis or dissertation can and should be submitted to the advisory committee for feedback as soon as they are complete, preferably before publication.

g. Graduation Checklist

Students should refer to the Graduate School's Graduation Checklist (https://graduate-and-international.uark.edu/graduate/current-students/thesis-dissertation-info/index.php) to be sure to complete all required steps and paperwork. In brief,

i. Students must apply to graduate by **March 1st, July 1st, or October 1st**

ii. The documents required by the Graduate School for a thesis or dissertation submission packet include:
   a. A Graduate School pre-check form stamped "Approved";
   b. A Thesis/dissertation title page with original committee signatures:
   c. The Thesis/Dissertation Submission form (http://graduate-and-international.uark.edu/graduate/current-students/forms.php);
   d. The Intellectual Property Disclosure form: http://graduate-and-international.uark.edu/graduate/current-students/forms.php
   e. (Doctoral students only) Survey of Earned Doctorates certificate: https://sed-ncses.org

f. A Record of Progress signed by the academic advisor to certify successful completion of the defense.

iii. For timely graduation, students should also ensure that their thesis/dissertation title and committee forms are on file in the Graduate School (https://graduate-and-international.uark.edu/graduate/current-students/forms.php), and that the departmental office has coordinated with the Graduate School to complete a degree audit.

h. Attendance at Departmental Seminar

All students in the department (as well as faculty and staff) are expected to attend the departmental seminar series. This series includes invited scientific talks, professional development sessions, and student entrance and exit seminars. In semesters in which students present their entrance seminars as part of this series, they should enroll in PLPA 5001 for academic credit.

I. Teaching Requirements

All full-time M.S. and Ph.D. students in the department are expected to acquire teaching experience before graduation, and should coordinate with the department head as well as their advisor on the best course of action to meet this requirement. **Typically, full-time M.S. students will be expected to serve as a teaching assistant (TA) for two laboratory sections for one semester, and full-time Ph.D. students will TA two laboratory sections for two semesters**. At the discretion of the department head, M.S. students may also gain teaching experience through other pathways such as leadership in outreach or extension. Teaching assignments are allocated at the discretion of the department head, with the goals of meeting students' training needs, meeting the department's teaching needs, and distributing the opportunity and responsibility to teach as fairly as possible.

Prior to serving as a TA, students must review the University of Arkansas Graduate School TA handbook (https://graduate-and-international.uark.edu/_resources/forms/ta-handbook.pdf), and attend the University of Arkansas Teaching Assistant Orientation which is offered each fall, typically in mid-August. This session covers lesson planning, professionalism and communication, hands-on Blackboard training, and teaching practice. For more information on this orientation, please see https://graduate-and-international.uark.edu/graduate/current-students/student-support/teaching-resources/index.php . Additional university resources for Tas are also provided at https://graduate-and-international.uark.edu/graduate/current-students/student-support/teaching-resources/resource-guide.php

An additional resource available specifically for international students is **ELAC 5050, International Graduate Teaching Assistant Training. This course is designed to** prepare international graduate assistants to assist or teach in U.S. university classes. The course focuses on enhancing teaching and communication skills, and cultural knowledge.

International students should also be aware that The Graduate School International Admission office is responsible for determining the English language courses required for international students who wish to become teaching assistants. This decision is based on the student's performance in various sections of standardized tests, such as TOEFL, IELTS, and GRE. To be eligible to TA, international students must either meet the minimum test score requirements or successfully complete the English language courses recommended by the Graduate School. International students should ascertain their eligibility to TA at least one semester prior to their planned TAship.

j. GPA Requirements for Graduate Standing and Research or Teaching Assistantships.

The university requires a minimum cumulative grade point average of 2.85 for graduate standing. To maintain an assistantship within the department, M.S. and Ph.D. programs in ENPL also require a minimum GPA of 3.0 in all required (i.e. core) courses. Students whose cumulative GPA drops below 2.85 or who receive a C or lower in a core course will be placed on academic probation for one semester. If the student cannot restore their GPA to the minimum within one semester, or if they receive more than one C in core coursework, their assistantship may be terminated.

k. Change of Status or Termination of Admission

Students who wish to alter their admission, registration, or assistantship status must, along with their advisor, process whatever actions or papersare needed for that change. Examples of such changes include modifications in status such as conditional admission to regular admission, degree status to non-degree status; simple changes in registration from audit to credit or dropping and adding a course; or numerous other changes in status. Any such modification in your status must be recorded in the Graduate School office, withthe program director and the Departmental office, not just with your advisor. Be certain that the process of change is complete and recorded before you operate under a new status.

Graduate student status will be terminated on failure to maintain academic standards required by the Graduate School and the Department. Termination may also result whena student fails to fulfill obligations within the time frame established by the Graduate School and the Department. Graduate status may be terminated before expiration of specified time under circumstances of academic dishonesty, incompetence, inefficiency,or neglect of duties; job-related misconduct; moral turpitude; financial exigency; or otherunforeseen circumstances that severely deter or halt progress in the student's program.

The Graduate School's policy on probation and termination are available at: https://catalog.uark.edu/graduatecatalog/objectivesandregulations/#academicdismissalacademicprobationandannualreviewtext

l. Grievance Policy

Problems that arise between a student and their advisor or committee members should if at all possible be discussed first with the major professor. If the major professor is unable to resolve the issue or if the student fears retaliation, the student may wish to see the department head and/or graduate program director. Both students and faculty mentors can also request that the department head or graduate program director serve as a mediator in disputes. The department also follows the Graduate School's grievance policy and procedures, which are available at: https://catalog.uark.edu/graduatecatalog/objectivesandregulations/#grievanceproceduresteext

III. ADDITIONAL GUIDELINES FOR ALL Ph.D. STUDY IN THE DEPARTMENT

a. **Candidacy Examinations:** Ph.D. students must satisfactorily pass written and oral candidacy examinations covering **their** discipline and supporting areas to advance to candidacy. The candidacy exam is intended to assess the candidate's suitability in knowledge **and** critical thinking to be considered for a Doctoral Degree. Qualifying exams are administered by the student's Advisory Committee, including the student's major advisor, and must be completed near the end of the student's second year (for students with an MS), or by the end of the student's third year

(for students entering the Ph.D. program with a BS). The exam should be taken no later than one year before completion of the degree program. Students should complete this requirement as soon as possible because candidacy is required to be eligible for certain fellowships and other awards.

i. ***Written Exams:*** The committee has a choice of two general formats for the written portion of the candidacy process: the open-format written exam or the grant proposal format. The open-format written exam is the default option; each Committee member separately administers a written exam of their own design to the student. The content and format of each committee member's written exam (timed or take-home exam; closed- or open-book assignment, etc) is at the discretion of the Committee member, and students should meet individually with the Committee in advance to discuss the expectations for each exam. In general, the objectives of this approach are to assess the student's broad disciplinary knowledge, critical thinking skills, and ability to synthesize information from multiple sources.

   For the grant proposal option, the student writes a grant proposal for a federal agency of their choosing, such as the USDA NIFA pre- or postdoctoral grant programs. Although the student can and should seek feedback during the writing process, the proposal should represent the student's own hypotheses, planned approaches, and writing. The proposal should include all necessary grant components such as budget and project management plan. The committee will evaluate the written document and then meet as a group with the student for follow-up questioning. The goal of this exercise is to assess the student's ability to synthesize the literature, generate hypotheses, and propose a realistic plan for experimentation and data analysis.

   The student may select the proposal option only with the unanimous approval of the advisory committee, and must also obtain committee approval for their chosen topic. Students should coordinate with each Committee member to schedule a time to take the written exam. Committee members should aim to have exams graded/evaluated within one week. The Committee will then convene without the student to discuss whether the student's performance on the written exams is sufficient to progress to the oral exams. The Committee will then inform the student of the result. After receiving the Committee's decision, the student should meet with each member individually to discuss their performance on the written exam and receive feedback.
   1. *If performance is deemed sufficient*, students will schedule the oral exam with the Committee
   2. *If performance is not deemed sufficient,* the student will be offered one additional opportunity to retake the written exam, or the portions on which their performance was not sufficient. If a student fails the written exam twice, they may be dismissed from the program or transferred to a M.S. program, at the discretion of the Advisory Committee and the Department Head.

ii. ***Oral Exams:*** After passing the written exams, the student should coordinate with the Committee to schedule the oral exam. The oral exam should be scheduled for no longer than one month after written exams are completed. Students should allocate a 3-hour time slot for the exam to allow adequate time for their presentation, Committee questions, and Committee deliberation. The student will present to the Committee on the background/rationale of their project, an outline of their completed and proposed dissertation research, and a summary of their results. Students are encouraged to keep the presentation to 30 minutes or less to allow adequate time for questions. The student will be questioned

by the Committee on their research and experimental design. In addition, the Committee may also ask questions to assess the student's broad knowledge of their field, their scientific literacy, and critical thinking abilities. Students are encouraged to meet in advance with each member of the Committee to seek guidance on how to prepare for the exam. At the conclusion of the oral exam, the Committee will convene without the student to determine whether the student's performance is deemed sufficient to pass.

1. *If performance is deemed sufficient*, the major advisor will notify the Graduate School that the student will advance to candidacy using the appropriate form: https://graduate-and-international.uark.edu/_resources/forms/candidacy-exam-notice.pdf
2. *If performance is not deemed sufficient,* it is up to the Committee's discretion whether to offer the student one additional opportunity to take the oral exam, and whether students should take additional coursework before retaking the exam. If a student fails the oral exam twice, they may be dismissed from the program or transferred to a M.S. program, at the discretion of the Advisory Committee and the Department Head.

IV. Course Requirements for Specific ENPL Degree Programs

Prerequisites to Degree Program: Applicants for graduate degrees must meet all requirements for admission to the Graduate School. Applicants without a master's degree will be accepted into the departmental program based on grade-point average (GPA), letters of recommendation, résumé and an adviser in the student's area of interest. Applicants must present Graduate Record Examination scores for the verbal, quantitative, and writing tests. To be accepted for the Master of Science degree, an undergraduate background in physical and biological sciences is essential. An undergraduate major in entomology is not required. A cumulative GPA of 3.00 is highly desirable.

Requirements for the Master of Science Degree: Students studying for the Master of Science degree with a limited undergraduate background in entomology may be expected to complete more than the minimum number of 30 credit hours required for the degree. A thesis, reporting of original research, and a final comprehensive oral examination also are required. Specific requirements follow:

General Course Requirements: The degree program and coursework for each candidate will be arranged on an individual basis. M.S. students must register for a minimum of 30 hours of graduate credit including 6 thesis hours.

Prerequisite Requirements: ENTO 3013. Introductory Entomology (Fa) or its equivalent. 3 hours.

Core Course Requirements: The student must take or have taken courses equivalent to:

ENTO 5024	Insect Diversity and Taxonomy	4
ENTO 5053	Insect Ecology	3
ENTO 5153	Insect Pest Management	3
ENTO 6113	Insect Physiology and Molecular Biology	3

A course in statistics for graduate credit is also required.

Seminar Requirements: Two semester hours of seminar are required. Seminar hours may be taken in Entomology (ENTO 6071) or, with Department Head approval, as a formal for-credit seminar offered in another department within the university. In addition, each student is required to present a seminar on his/her thesis research plans during the first year of the degree program and an exit seminar on the thesis research prior to leaving the program.
Residence Requirements: A minimum of 30 weeks in residence is required for the M.S. degree.

Grade Point Average Requirement: A minimum 3.00 GPA must be maintained. If the cumulative GPA falls below 3.00, or research or general academic progress is unsatisfactory, the student's performance will be re-evaluated by the Advisory Committee

and a recommendation made on continued status as a graduate student. For details about this process, please see the Graduate Student Handbook on the departmental website.

Comprehensive Examination: A comprehensive oral examination covering coursework and defense of the thesis research is required. The examination is generally taken during the student's final semester.

Students should also be aware of Graduate School requirements with regard to master's degrees.

a. Specific Course Requirements for the Master of Science in Entomology

Objectives: Students studying for the Master of Science in Entomology degree will gain knowledge in molecular biology, pest management, community ecology, and evolution. They complete a thesis and can apply tools of genomics, microscopy, integrated pest management or pollinator biology. Our graduates are competitive in the job market and go on to work in many fields including pest control, applied ecology, human health, veterinary biology, agriculture, or forestry. Our courses in Entomology are listed in Appendix 4.

Prerequisites: If a student has not taken an introductory course in Entomology prior to being accepted into the program, the student must consult with the instructor of ENTO 3013 (Introduction to Entomology), and arrange to cover the content as a Special Problems class. At the student's first meeting with their advisory committee, the committee should also review the student's past preparation in biology, chemistry, physical sciences and statistics to determine if any remedial coursework is necessary.

Seminar Courses: Students are required to have 2 ~~3~~ credits of seminar courses, which can include 1 semester of PLPA 5001 (Entomology and Plant Pathology presentation skills), and 1 credit of ENTO 6071 (Colloquium in Entomology and Plant Pathology), or other participatory seminar courses approved by the students' advisory committee. In ALL semesters of the students' degree programs, they are expected to attend the weekly departmental seminar series, which is not a formal course.

Statistics Requirement: All students are expected to complete (at UA or a prior institution) a 3 CR graduate course in experimental design and statistics, such as AGST 5014, Experimental Design.

Other Credit Requirements: ADHE requirements state that the master's degree requires a minimum of 30 semester credit hours beyond the bachelor's degree, and must include at least 50 percent graduate-only semester hours in the field of study. The basic course requirements for each degree candidate in the MS program will be arranged on an individual basis by the student and their Advisory Committee and must include:

- 6 hours of thesis credit
- a minimum of 24 graduate level hours in course work, to include:
- 2 hours of Seminar (but no more than 3h)
- 3 hours of statistics (if not completed at a previous institution)

- 6 hours of Special Problems No more

Although committees may customize curricula, the standard requirement is:

Credits	Course work
(3)	ENTO 4123. Insect Pest Management
(4)	ENTO 5024. Insect Diversity and Taxonomy
(3)	ENTO 5053. Insect Ecology
(3)	ENTO 6113. Insect Physiology and Molecular Biology
(2)	Seminar courses
(3)	Statistics
(7)	Electives
(6)	Thesis
30	**Total**

Electives may include any graduate level course in a subject related to MS program completion.

b. Specific Course Requirements for the Master of Science in Plant Pathology

Objectives: Students can enter the program in Plant Pathology from many areas of study but a background in biological sciences is very helpful. This program allows an advanced training in plant pathology with emphasis in control of diseases, breeding for disease resistance in major crops, diseases of fruits, vegetables and agricultural crops, mycology, bacteriology, nematology, virology and molecular and cell biology of pathogens. Our courses in Plant Pathology are listed in Appendix 5.

Prerequisites: If students have not taken PLPA 3004 (Principles of Pathology, Fa) or its equivalent prior to being accepted into the program, they must consult with the instructor and arrange to take PLPA 502V Special Problems – Plant Pathology Principles for two credits or make other provisions to satisfy this deficiency. At the student's first meeting with their advisory committee, the committee should also review the student's past preparation in biology, chemistry, physical sciences and statistics to determine if any remedial coursework is necessary.

Seminar Courses: Students are required to have 2 credits of seminar courses, which can include 1 semester of PLPA 5001 (Entomology and Plant Pathology presentation skills), 1 credit of ENTO 6071 (Colloquium in Entomology and Plant Pathology), or other participatory seminar courses approved by the students' advisory committee. In ALL semesters of the students' degree programs, they are expected to attend the weekly departmental seminar series, which is not a formal course.

Statistics Requirement: All students are expected to complete (at UA or a prior institution) a 3 CR graduate course in experimental design and statistics, such as AGST 5014, Experimental Design or equivalent.

Other Credit Requirements: ADHE requirements state that the master's degree requires a minimum of 30 semester credit hours beyond the bachelor's degree, and must include at least 50 percent graduate-only semester hours in the field of study. The basic course requirements for each degree candidate in the MS program will be arranged on an individual basis by the student and their Advisory Committee and must include:

- 6 hours of thesis credit
- a minimum of 24 graduate level hours in course work, to include:
    - (16 CR) plant pathology or other approved graduate level electives
    - (2 CR) of Seminar (but no more than 3h)
    - (3 CR) statistics
    - No more 6 hours of Special Problems
    - (6) Thesis PLPA 600V

30 Total

[a] Concept Courses include PLPA 5303, Host Pathogen Genetics/Physiology and PLPA 5313, Ecology and Epidemiology.

[b] Proposal, topic and exit seminars.

[c] Discipline Courses include Plant Pathogenic Fungi, Plant Nematology, Plant Virology, and Plant Bacteriology.

[d] Electives may include any graduate level course in subject matter related to MS program completion.

c. Specific Course Requirements for AFLS Entomology Ph.D.

Requirements for Ph.D. in AFLS with Entomology Concentration

Prerequisites to Degree Program: A Master of Science degree is desirable. A student with a Bachelor of Science and an exceptional record in academics and/or research may be approved for admission to the Ph.D. program in Agricultural, Food and Life Sciences if the Graduate Student Concentration Admissions Committee of the desired concentration deems them qualified and approval is granted by the AFLSPH Steering Committee. A student admitted to the University of Arkansas, pursuing an M.S. and in good academic standing may apply to be admitted to the doctoral program and forgo completing the M.S. degree if so approved by the AFLSPH Steering Committee and the AFLSPH Graduate Concentration Admissions Committee. A minimum grade point average of 3.00 (on a 4.00 scale) on previous college-level course work is required.

Admission Requirements for Entry: To be considered for admission, a student must submit a letter of intent, along with the application for admission indicating the desired degree concentration, areas of interest and career goals. Official transcripts of all previous college-level course work must be submitted. Three letters of recommendation are required. These letters should address the character and academic capability of the applicant. Applications will first be reviewed by the AFLSPH Steering Committee which will assign the student to the appropriate Graduate Student Concentration Admissions Committee for review. The Concentration Admissions Committee will make the final determination of admittance into the AFLSPH program and the concentration.

Requirements for Doctor of Philosophy Degree: The Ph.D. program in Agricultural, Food and Life Sciences requires a minimum of 72 credit hours after a Bachelor of Science or Bachelor of Arts degree or a minimum of 42 hours after a Master of Science or Master of Arts degree. Here is more information to Ph.D. programs.

General course requirements for each degree candidate are arranged on an individual basis by the Faculty Adviser, the Graduate Advisory Committee and the candidate in accordance with guidelines of their concentration. Alternate courses may be selected at the discretion of the committee.

All students must complete 6 hours of elective course hours and 2 hours of seminar. One seminar must be a research proposal presentation and the other must be an exit seminar presenting the dissertation research results. All students must complete 18 hours of doctoral dissertation hours. Students entering the doctoral program with only a B.S. or B.A. must also complete an additional 30 hours (to reach the 72 hour post B.S./B.A. requirement). Students must satisfactorily pass written and oral candidacy examinations covering their discipline and supporting areas. These examinations must be completed at least one year before completion of the Ph.D. degree program in Agricultural, Food and Life Sciences. Each candidate must complete a doctoral dissertation on an important research topic in the concentration field. The specific problem and subject of the dissertation is determined by the faculty adviser, the student and the Graduate Advisory Committee. A

dissertation title must be submitted to the dean of the Graduate School at least one year before the dissertation defense. Provisional approval of the dissertation must be given by all members of the Graduate Advisory Committee prior to the dissertation defense. Students must pass the oral defense and examination of the dissertation given by the Graduate Advisory Committee. A student cannot be approved for conferral of the doctoral degree until after completion of all coursework, written and oral candidacy exams, the defense passed and dissertation accepted by the Graduate School and an application for the degree has been filed with the Registrar's Office and the fee paid.

Additional Requirements for Entomology Concentration
In addition to the general requirements for the Ph.D. program in Agricultural, Food and Life Sciences, students in the Entomology concentration must complete:

ENTO 5024	Insect Diversity and Taxonomy	4
ENTO 5053	Insect Ecology	3
ENTO 5153	Insect Pest Management	3
ENTO 6113	Insect Physiology and Molecular Biology	3
AGST 5014	Experimental Design	4

Objectives: The PhD program in Entomology offers an opportunity for advanced study and research to students who desire a specialized understanding of entomology. Success in the program is judged by excellence in research, advanced competence in the chosen area of specialty, broad understanding of entomology and the scientific process, and ability to communicate at a scholarly level.

Prerequisites: If a student has not taken an introductory course in Entomology prior to being accepted into the program, the student must consult with the instructor of ENTO 3013 (Introduction to Entomology), and arrange to cover the content as a Special Problems class. At the student's first meeting with their advisory committee, the committee should also review the student's past preparation in biology, chemistry, physical sciences and statistics to determine if any remedial coursework is necessary.

Credit requirements: Students entering the Entomology PhD program without an MS degree are required to complete 72 credit hours of graduate-level credit for graduation. Students entering with an MS degree are required to complete 42 credit hours for graduation. Fulfillment of these credit hours can include both coursework and dissertation hours. Students are expected to take the following core courses meant to provide a broad understanding of entomology. Students that have already taken equivalent courses as part of another degree program can be exempted from these courses by the advisory committee.

Core Entomology Courses

- ENTO 4123. Insect Pest Management (3 credits)
- ENTO 5024. Insect Diversity and Taxonomy (4 credits)
- ENTO 5053. Insect Ecology (3 credits)
- ENTO 6113. Insect Physiology and Molecular Biology (3 credits)

Seminar Courses: Students are required to have 4 credits of seminar courses, which can include 1 semester of PLPA 5001 (Entomology and Plant Pathology presentation skills), 3 credits of ENTO 6071 (Colloquium in Entomology and Plant Pathology), or other participatory seminar courses approved by the students' advisory committee. In ALL semesters of the students' degree programs, they are expected to attend the weekly departmental seminar series, which is not a formal course.

Statistics Requirement: All Ph.D. students are expected to complete two graduate-level courses in data science at the UA or a previous institution. This should include:

- a 3 CR graduate-level course in experimental design and statistics, such as AGST 5014 (Experimental Design)
- a second, more advanced 3 CR course in data science. This includes AGST 5023 (Principles of Experimentation), or, with approval of the advisory committee, a course in other areas of data science such as bioinformatics

Other Credit Requirements: The remaining credits toward graduation with a PhD can be obtained through other coursework or dissertation credits at the discretion of the student and advisory committee.

d. Specific Course Requirements for AFLS Plant Pathology Ph.D.

Objectives: The PhD program in Plant Pathology offers an opportunity for advanced study and research to students who desire a specialized understanding of Plant Pathology. Success in the program is judged by excellence in research, advanced competence in the chosen area of specialty, broad understanding of Plant Pathology and the scientific process, and ability to communicate at a scholarly level.

Prerequisites: If a student has not taken an introductory course in Plant Pathology prior to being accepted into the program, the student must consult with the instructor and arrange to take PLPA 502V Special Problems – Plant Pathology Principles for two credits or make other provisions to satisfy this deficiency. At the student's first meeting with their advisory committee, the committee should also review the student's past preparation in biology, chemistry, physical sciences and statistics to determine if any remedial coursework is necessary.

Credit requirements: Students entering the Plant Pathology PhD program without an MS degree are required to complete 72 credit hours for graduation. Students entering with an MS degree are required to complete 42 credit hours for graduation. Fulfillment of these credit hours can include both coursework and dissertation hours. Students are expected to take the following core courses meant to provide a broad understanding of Plant Pathology. Students that have already taken equivalent courses as part of another degree program can be exempted from these courses by the advisory committee.

Core Plant Pathology Courses

PLPA 5303- Advanced Plant Pathology: Host-Pathogen Interactions
PLPA 5313- Advanced Plant Pathology: Ecology and Epidemiology
PLPA 5404 Diseases of Economic Crops
PLPA Core elective

Take one course from the following selection: PLPA 5223- Plant Disease Control, PLPA 5603- Plant Pathogenic Fungi, PLPA6203- Plant Virology, (Missing: Plant Bacteriology and Nematology)

Seminar Courses: Students are required to have 4 credits of seminar courses, which can include 1 semester of PLPA 5001 (Entomology and Plant Pathology presentation skills), 3 credits of ENTO 6071 (Colloquium in Entomology and Plant Pathology), or other participatory seminar courses approved by the students' advisory committee. In ALL semesters of the students' degree programs, they are expected to attend the weekly departmental seminar series, which is not a formal course.

Statistics Requirement: All Ph.D. students are expected to complete two graduate-level courses in data science. This should include

- a 3 CR graduate-level course in experimental design and statistics, such as AGST 5014 (Experimental Design) or equivalent
- a second, more advanced 3 CR course in data science. This includes AGST 5023 (Principles of Experimentation), or, with approval of the advisory committee, a course in other areas of data science such as bioinformatics

Other Credit Requirements: The remaining credits toward graduation with a PhD can be obtained through other coursework or dissertation credits at the discretion of the student and advisory committee.

V. Assistantships

Acceptance of a graduate assistantship (either a research assistantship or a teaching assistantship) constitutes a contractual agreement with the University of Arkansas. Graduate Assistants are employees and their appointments extend to the end of their annual contracts.

Time to Degree Completion: The table below defines the time frames in which the requirements for a M.S. or Ph.D. degree are expected to be completed by graduate research assistants enrolled in degree programs.

M.S.	6 semesters (beyond the Bachelors)
Ph.D.	10 semesters (beyond the Masters)
Ph.D.	12 semesters (beyond the Bachelors)

The above time limits do not include summer sessions but do include the semester in which an assistantship begins even if it begins in mid-session. Assistantships will be withdrawn after completion of the final semester.

A research assistantship entails an obligation to work ~20 hours per week on research-related tasks assigned by the major advisor. This does not include time committed to coursework. Students should also be aware that thesis and dissertation projects may require more than 20 hours a week for completion. Similar to coursework, completion of the research project and the thesis or dissertation is ultimately a component of the student's education rather than a paid service activity. A teaching assistantship entails an obligation to work ~20 hours per week on teaching-related tasks, both as a way to fund their degree and as an opportunity to receive training in teaching. Students on TAships are also expected to make adequate progress on their coursework and thesis/dissertation project.

As noted in Section IIdi above, students should meet with their advisor within the first week of arrival to learn the advisor's expectations for their work commitment and schedule, and also to set a regular meeting schedule.

VI. Residency and Registration Requirements

Residency: Students should consult the Graduate School's policies and procedures on establishing in-state residency to reduce tuition and fees (https://registrar.uark.edu/student-records/resident-reclassification/index.php).

Registration: The Graduate School's policies on the registration process can be found at https://graduate-and-international.uark.edu/graduate/current-students/registration-enrollment/). A schedule of classes for each semester can be acquired online at https://uaconnect.uark.edu/ Brief descriptions of courses and prerequisites are found in theGraduate Catalog available online at: https://registrar.uark.edu/courses-and-scheduling/index.php Graduate students are responsible for enrolling into their coursework during the open enrollment period. Students should consult the Graduate School to confirm registration deadlines for any given semester, but in general the deadlines are as follows: **Fall semester---August 1. Spring semester---December 1. Summer sessions---April 15.**

Registration Requirements: At the time of writing this handbook, the registration requirements for students on a graduate assistantship (research assistantship or teaching assistantship) is as follows:

Spring and Fall Semesters

Percent of Appointment	Minimum Enrollment	Maximum Enrollment	Tuition Portion Paid
0-49%	9	15	Out-of-state (NONR) paid
50-74%	6	15	In- & out-of-state paid
75%	3	6	In- & out-of-state paid

Summer

(10-12-week assistantships -- enrollment may be in any summer session):

Percent of Appointment	Minimum Enrollment	Maximum Enrollment	Tuition Portion Paid
0-49%	3	12	Out-of-state (NONR) paid
50-74%	3	12	9 hours FEES & all NONR paid
75%	3	6	9 hours FEES & all NONR paid

Graduate students who are **NOT** appointed to graduate assistantships should have the Registrar verify their enrollment. These graduate students will be considered as follows:

VII. **Full-time**: 9 + hours
VIII. **3/4-time**: 7-8 hours
IX. **1/2-time**: 5-6 hours
X. **Less than 1/2-time**: 1-4 hours

VII. Other Useful Resources for Graduate Students

a. **Financial and Costs and Funding.** Information on costs and financial aid can be found at https://graduate-and-international.uark.edu/graduate/costs-and-funding/financial-aid/index.php. A list of scholarships and fellowships is available at https://graduate-and-international.uark.edu/graduate/costs-and-funding/fellowships-scholarships/

b. **Division of Student Affairs.** (https://studentaffairs.uark.edu/) The Division's website provides useful information on topics such as scholarships as well as links to many useful offices and programs related to student health, housing, professional development, and other services.

c. **Student Health.** For information on student health insurance and health care at the Pat Walker Health Center, please see https://health.uark.edu/billing-insurance/insurance.php . Support for students under any type of emotional stress is also freely available from the university's **Counseling and Psychological Services (CAPS):** https://health.uark.edu/mental-health/index.php .

d. **Student Associations.** The department's graduate students have formed two graduate student organizations (one in Entomology and one in Plant Pathology) that are University Registered Student Organizations (RSOs). These RSOs can request university funds for invited speakers and a number of civic or social activities. They host social events and seminars, and conduct public service events through which graduate students can obtain outreach experience. This is an opportunity to develop civically and professionally. For more information and to join their mailing lists, please contact asierram@uark.edu (Plant Pathology) or uarkentooutreach@gmail.com (Entomology). In addition, there is also a university-wide graduate student association (https://gpsc.uark.edu/), and many other student associations available at https://osa.uark.edu/registered-student-organizations/.

e. **Professional Societies.** One way to show interest in the professions of Entomology or Plant Pathology is to participate in professional societies in these or related disciplines. Manyscientific societies are interested in having students as members so there are special rates for students. The Entomological Society of America (ESA, https://entsoc.org/) and the American Phytopathological Society (APS, https://www.apsnet.org/Pages/default.aspx), are examples of some relevant societies. Students are expected to attend annual meetings of the different societies and participate by presenting papers and posters at these annual meetings. Many of these societies have regional branch meetings in addition to nation-wide meetings that may be of interest to students. The Graduate School provides financial support for student travel to conferences (https://graduate-and-international.uark.edu/graduate/costs-and-funding/travel-and-research/travel-grants.php).

f. **ENPL Office Support.** The staff of the ENPL Office (217 Plant Science Building) is here to assist you with your needs related to your employment and research.Computers and

printers are available for use by graduate students at various computerlabs located on campus and in the Department. You will be assigned a mailbox in the Departmental mail room in the Plant Science Building.

g. **The Credit Union.** If you hold an assistantship, you are an employee of the University of Arkansas, and as such, you are eligible for membership in the UARK Federal Credit Union. You can obtainfurther information from the UARK Federal Credit Union, 50 W Van Asche, Fayetteville, AR 72703. For more information: https://uarkfcu.com/

h. **Housing.** Most graduate students have acquired housing off campus in Fayetteville. Further information can be obtained from the Director, Housing Office, 9th Floor Hotz Hall, University of Arkansas, Fayetteville AR 72701. For More information: http://housing.uark.edu/

i. **Transportation.** During the spring and fall semesters, a transit system of University buses circuits a widearea of the city. Route maps and schedules can be obtained at the transit office. For more information: https://parking.uark.edu/

j. **Parking.** Parking for private vehicles is limited both on the campus and near the campus. A parkingpermit may be obtained from the Parking Office. For more information: https://parking.uark.edu/

k. **Use of University Vehicles.** State vehicles are operated by the Department of Plant Pathology for official business only. To qualify as a driver for state vehicles you must possess a current and valid Arkansas driver's license.

l. **University of Arkansas Vehicle Safety Policy.** Operators of University of Arkansas vehicles, rental vehicles, personal vehicles, or anyvehicle for University business purposes must have a valid driver's license to operate the type of vehicle being driven. Employees who regularly operate vehicles as a condition of employment must complete an Authorization to Operate form, which is a release to permit the University to check an employee's driving record initially and on a continuous basis via the Arkansas State Vehicle Safety System Information Network. Driving records for non-resident drivers will be obtained by sending the form to the Department of Finance and Administration, Office of Driver Services. Applicants being considered for employment to positions requiring operation of vehicles for University business purposes on a regular basis must also complete this form. Examples of regular operators would be those positions with duties which include driving a vehicle on a daily or weekly basis; and positions that require travel regularly as an essential part of their employment, i.e., recruiters, etc.

Driving records will be evaluated according to the point system established by the Arkansas State Office of Driver Services. Drivers who accumulate 10 points or more according to the Office of Driver Services Chart will be subject to administrative action and possible driving restrictions as described under "Procedures" . Please note that there is a 3-year look back period for driving record violations. The total points assigned to each violation will be used in determining when administrative action is required. Risk

Management will notify departments each time a driver receives a violation which results in 10 or more accumulated points and/or when a driver's license has been suspended, revoked, or restricted.

For more information, see: http://risk.uark.edu/vehicle-safety-policy.php

m. Other Helpful Links:

- Graduate Catalog https://catalog.uark.edu/graduatecatalog/
- Thesis and Dissertation https://graduate-and-international.uark.edu/_resources/forms/thesis-dissertation-guide.pdf Office of Research Support & Sponsored Programs research.uark.edu
- Research Compliance https://rsic.uark.edu/other/responsible/index.php
- Financial Aid https://graduate-and-international.uark.edu/graduate/costs-and-funding/index.php
- Graduate School Regulations and Student Rights Under the Family Educational Rights and Privacy Act (FERPA) https://catalog.uark.edu/graduatecatalog/objectivesandregulations/

Appendix 1: Suggested Template for a Mentoring Plan between Major Advisor and Student

Graduate Research Mentoring Plan

This plan should be completed during a new graduate researcher's first week on campus, and because needs and arrangements sometimes change, revisited annually. The agreement should be jointly filled by both the graduate researcher and mentor, with both keeping a copy.

Expectations of Mentors:

1. Ensure a safe, respectful, and inclusive working environment.
2. Guide and support graduate researchers through all stages of their degree.
3. Ensure that students are trained to uphold the highest standards of research integrity and ethics.
4. Ensure that students receive relevant and up-to-date safety training.
5. Provide access to necessary facilities and resources to complete their degree.
6. Assist in developing graduate student research topics, questions/hypotheses, methods, and milestones necessary for successful thesis completion.
7. Clearly define expectations for authorship and intellectual property (IP) ownership.
8. Provide constructive feedback and help during preparation of presentations (e.g., talks and posters).
9. Provide constructive feedback on manuscript and/or thesis drafts.
10. Agree to timelines for receiving and providing feedback on written drafts.
11. Recognizing that graduate students have diverse professional goals including non-academic careers, encourage and support students to take advantage of professional development opportunities (e.g., conferences and workshops).
12. Agree to a schedule of regular individual meetings with graduate students.
13. Try to provide two days' notice for cancelled meetings.
14. Be reasonably accessible either remotely or in person if needed outside of scheduled meetings.
15. Promptly respond to administrative tasks (e.g., progress reports, leave requests).
16. Be familiar with university and program policies and requirements for graduate students, including visa rules and requirements for international students.
17. Refrain from asking graduate researchers for personal favors unrelated to their academics, and make clear that any refusal will have no negative consequences.
18. Be receptive to graduate student feedback on mentoring, and try to resolve any conflicts respectfully and directly as soon as they arise.
19. Advise on where to seek confidential advice and explain the process of making a formal complaint if difficult situations cannot be resolved.
20. Understand that students may freely consult other trusted individuals if they wish to raise any concerns.

Expectations of Graduate Researchers:

1. Help ensure that the lab is a safe, supportive, and inclusive working environment.
2. Be familiar with university and program policies and requirements for graduate students.
3. Be self-directed in learning and research, including keeping up to date with the literature.
4. Maintain practical timelines for completing research milestones and the thesis.
5. Make consistent degree progress. A full-time graduate student should spend on average 40 hours per week on combined studies (research, teaching, coursework).

6. Uphold the highest standards of research integrity and ethics.
7. Agree to deadlines for providing drafts to allow sufficient time for mentors to review.
8. Try to provide two days' notice for cancelled meetings.
9. Take advantage of professional development opportunities and skills training.
10. Discuss mentor's expectations for authorship and IP ownership.
11. Regularly attend departmental seminars and meetings.
12. Actively communicate with your mentor and ask for help when you need it.
13. Try to resolve any problems or disputes with your mentor or coworkers as soon as they arise. If you cannot resolve the issue or are not comfortable talking with your mentor, you can contact members of your thesis committee, your graduate program director, or your department head.

Mentoring Agreement (to be jointly completed by the graduate researcher and mentor):

1. **Frequency of meetings and preferred means of contact:**

The mentor and advisee will meet on a regular basis to discuss progress and plan for future work. Meetings will typically occur every (define the typical period for your lab), with an expected minimum frequency of once a month. The format will be (in person/Zoom?) (individual/group?) meetings. There may additionally be separate research group meetings. If a different meeting schedule is preferred, please describe below. Otherwise, write "agreed."

Where will meetings take place:

☐Mentor's office
☐Graduate researcher's office
☐Remotely (e.g., Zoom)
☐Other (please specify):

While emergencies may arise, otherwise two days' notice is usually sufficient for meeting cancelation. If more notice is required, please describe below. Otherwise, write "agreed."

2. **C**

The graduate researcher may need to contact their mentor between scheduled meetings and vice versa. Between scheduled meetings, the preferred means of contact is (can check

more than one):

☐Email
☐Text/Slack
☐Call/Zoom
☐Drop by mentor's office
☐Drop by graduate researcher's office
☐Other (please specify)

3. Workplace attendance and working hours:

Full-time enrolled graduate students are expected to commit 40 hours per week towards their studies inclusive of all research, coursework, and teaching activities (e.g., 10 hours classes, 10 hours teaching, 20 hours thesis research). Some projects require alternative arrangements, such as travel for fieldwork or occasional weekend, evening, and/or holiday management of experiments or animal care. If such arrangements apply, please record them. Otherwise, write "agreed."

Note that meetings will not be scheduled during university holidays, evenings, nights, and weekends or other standard time away from work. Meetings should only be scheduled at such times in exceptional circumstances.

4. Holidays and Vacation Time:

Full-time enrolled graduate students follow the same schedule of holidays as employees. Unlike undergraduate students, they are expected to be present even when classes are not in session. Graduate students are eligible for all paid holidays observed by the university, but they do not accrue vacation time. If students plan to travel or take other time off work, they should……(here, the advisor should indicate their policies on graduate student time off, including how much notice the advisor requires and how much time is reasonable).

5. Cou

For graduate students taking courses, the number per semester is flexible, and it is useful to discuss expectations for number of lecture courses that will be taken per semester. Most

students take either one or two lecture courses per semester, with pros and cons for each approach (e.g., finishing coursework faster vs. having more time for research). Noting that this may change semester by semester, the number of lecture courses taken per semester will be:

☐One
☐Two
☐Other (please specify)

6. Research ethics and integrity:

Graduate students and mentors should be familiar with Research Compliance policies at the University. While recommended for all graduate students and mentors, all federally funded researchers must be trained in Responsible Conduct of Research via the Collaborative Institutional Training Initiative (CITI). Please note whether the graduate student is required to take CITI training:

7. Turnaround times:

Recognizing that it may not always be possible for both parties to meet turnaround times, it is still useful to set expectations.

If **verbal** feedback is needed on written work at a scheduled time, the graduate researcher will provide that work at least two days in advance. If other timelines are preferred, describe below. Otherwise, write "agreed."

If **written** feedback is needed on written work, the graduate researcher will provide that work at least one week in advance. If other timelines are preferred, describe below. Otherwise, write "agreed."

8. Intellectual property and authorship

Mentors and mentees should be aware of the University's IP, copyright, and patent policies. Discuss how authorship/inventorship will be agreed upon in the case that IP arises from the graduate research (or attach separately).

Mentors and graduate researchers should be aware of authorship best practices and possible conflicts of interest. Discuss how authorship and author order will be agreed upon for manuscripts that arise from the graduate research (or attach separately).

9. Facilities and funding:

The mentor is expected to provide appropriate resources for conducting research. Please check whether the following will be provided:

- ☐ Desk/workspace
- ☐ Computational resources (e.g., computer, software)
- ☐ Lab bench
- ☐ Field site(s)
- ☐ Other (please describe):

If the graduate researcher has additional research-specific facility or resource requirements, please describe. Otherwise, write "N/A" if not applicable.

How will the graduate researcher be funded during the academic year (e.g., TA or RA)? If RA, list the funding source and the active dates.

Will the graduate researcher be funded during the summer? If yes, list the source of funding and dates if applicable.

Is the graduate researcher eligible for additional funding (e.g., Distinguished Doctoral or Doctoral Academy Fellowships)? If yes, please list.

10. Trusted contact persons:

It is important for graduate researchers to have trusted individuals whom they may contact for advice or to raise any concerns. Some potential contact persons in BISC include:

Dr. Ken Korth: Department Head for ENPL
Dr. Ashley Dowling: Entomology Graduate Studies Coordinator
Dr. Ioannis Tzanetakis: Plant Pathology Graduate Studies Coordinator
Dr. Douglas Rhoads: Cell and Molecular Biology Graduate Studies Coordinator

If any of the faculty listed above are collaborators with the mentor and thus have a possible conflict of interest, please list alternatives here:

Date of Discussion:

APPENDIX 2: TEMPLATE FOR ANNUAL PROGRESS REPORT AND FACULTY FEEDBACK ANNUAL STUDENT PROGRESS REPORT

PART 1 (COMPLETED BY STUDENT; TURN IN TO ADVISOR, ADVISORY COMMITTEE, AND DEPT OFFICE BY MAY 31)

Name and Date:

Please briefly describe the progress made since the last annual report.

a. **Progress on Coursework** (Courses taken and Grades Received)

b. **Scientific Presentations** (Conference talks or posters)

c. **Publications** (submitted, in press, or in print)

d. Awards

e. **Teaching, Outreach, or Extension**

f. **Research Progress** (In ≤500 words, what were your primary accomplishments this year towards completion of your thesis- or dissertation project?)

g. **Plans and Priorities for the Coming Year (**In ≤500 words, what are your priorities in the coming year for progress towards degree completion?)

h. **Obstacles and Requests.** Have you encountered any major obstacles to progress this year? Do you have any requests for changes that would assist your degree progress or career goals? Are the terms of the mentoring agreement working well?

i. **Degree Requirements Checklist**

Milestone	**Date Completed?**
Meet with advisor to discuss goals and expectations; review an assistantship agreement	
Review university codes of conduct; complete a training in the Responsible Conduct of Research and Environmental Health and Safety trainings	
Form an advisory committee and submit the committee form	
Annual meeting with the advisory committee (date completed or scheduled to be completed)	
Up-to-date curriculum plan approved by the advisory committee and filed with the departmental office	
Entrance seminar completed	
Thesis or dissertation title form submitted to the Graduate School	
Core curriculum completed?	
Candidacy Exam Completed (Ph.D. only)	
Teaching Experience Requirement Met? (if applicable)	
Graduation form submitted	
Degree Audit performed by the Graduate School	
Draft thesis/dissertation submitted to advisor	
Thesis/dissertation submitted to advisory committee	
Complete thesis/dissertation pre-check with Graduate School	
Give an exit seminar	
Complete the dissertation defense	
Revise dissertation if needed to address committee and advisor feedback	
Obtain the advisor’s and committee’s signatures on the dissertation title page and the Record of Progress form	
Submit the thesis packet to the Graduate School	

PART 2 (COMPLETED BY ADVISOR AFTER REVIEWING PART 1. PROVIDE TO STUDENT, ADVISORY COMMITTEE, AND DEPT OFFICE BY JUNE 15)

A. Is the student making satisfactory progress on coursework?

B. Is the student making satisfactory progress on research? (Please comment on their progress, and provide constructive suggestions as appropriate).

C. Is the student making satisfactory progress on teaching, outreach, or extension?

D. Do the student's plans for the coming year seem reasonable? Do you have any comments or suggestions?

E. Is the student developing strong professional skills? To your knowledge, does the student meet standards of professionalism and safe and ethical conduct?

F. Are the terms of the mentoring plan working well? Do you have any feedback on obstacles or student requests?

Appendix 3

Assessment Plan for Departmental Degree Programs

PART 1. CONSTRUCTIVE FEEDBACK FOR THE STUDENT

To be completed by each committee member and given to the student

- **after the entrance seminar/research proposal;**
- **after the candidacy exam (for Ph.D);**
- **after the thesis/dissertation defense.**

For each of the four areas below, please comment on the student's strengths and provide suggestions on goals for future growth, where appropriate. For learning objectives that students are expected to attain in the three skill areas, please review the attached rubrics.

- Background knowledge (of entomology or plant pathology and their area of specialization)
- Oral communication skills
- Written communication skills
- Problem solving and critical thinking skills required to design and execute scientifically sound research

PART 2. PROGRESS ASSESSMENT FOR THE DEPARTMENT

To be completed by the committee as a group and given to the graduate coordinator

1) after the research proposal;

2) after the written and oral candidacy exams; and

3) after the thesis defense.

For each of the four areas below, please rank whether the student is making adequate progress. Keep in mind that we aim for incremental growth, not perfection. For definitions of normative progress in the three skill areas, please see the attached rubrics. The student is showing adequate growth or progress in:

Background knowledge (of entomology or plant pathology and their area of specialization)
oYes
oNo

Oral communication skills
oYes
oNo

Written communication skills
oYes
oNo

Problem solving and critical thinking skills required to design and execute scientifically sound research
oYes
oNo

ORAL COMMUNICATION VALUE RUBRIC

Adapted from AACU on oral communication

Definition

Oral communication is a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors.

Evaluators are encouraged to assign a one to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone By Graduation	**Milestones By Midpoint/Candidacy**	**Benchmark By Entrance Seminar**
Organization **Scientific presentations should include all of the following sections: introduction with hypotheses and objectives, methods, results and conclusion.**	The presentation includes all the sections and the contents of each section are seamlessly integrated. Each section is clear and concise. The final conclusions are fully supported. Overall, the presentation is memorable.	The presentation includes all the sections and the contents of each section are consistently integrated. Most of the final conclusions are supported. The presentation is very informative.	The presentation includes all the sections and the integration of all the sections is apparent. Some sections are not thoroughly explained. Some conclusions are supported. The presentation is understandable.
Language and use of technical vocabulary	Uses appropriate and precise professional language and, language that is appropriate to the audience.	Mostly uses appropriate and precise professional language and, language that is appropriate to the audience.	Uses appropriate andprecise professional language, but may not always be appropriate to audience.

Delivery **Clearly points to pertinent aspects**	Demonstrates confidence and knowledge. Engages the audience by skillfully keeping eye contact with the audience while making use of the supporting material and appropriate use of technology. Body language appropriately used to enhance value of presentation.	Appears comfortable with the topic and, consistently engages the audience. Makes appropriate use of the supporting material. Body language tentative.	Does not always appear comfortable with the topic or able to engage the audience. Uses supporting materials inconsistently... Limited eye contact with audience. Some distracting mannerisms.
Supporting Material **Presented and shows clear understanding**	Supporting materials are attractive, carefully designed and with clear purpose that elegantly supports the message. They do not repeat the oral content. Proper credit to references given.	Supporting materials are well designed and properly used to convey message. Proper credit to references given.	Supporting materials are adequately prepared and help conveying the message. Proper credit to references given in most cases.
Central Message effort	Central message is strongly supported by all the sections of the presentation. The audience fully understands the relevance and implications of the research.	Central message is clear. The audience understand the basic aspects of the research.	Central message is clear. The audience can deduce the importance of the research.

WRITTEN COMMUNICATION VALUE RUBRIC

Adapted from the written communication rubric from AACU

Definition

Written communication is the development and expression of ideas in writing. Written communication involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences across the curriculum.

Evaluators are encouraged to assign a one to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone By Graduation	**Milestones By Midpoint/Candidacy**	**Benchmark By Entrance Seminar**
Purpose for Writing	Demonstrates a thorough understanding of audience, intent of writing is clear and focuses all elements of the work.	Demonstrates adequate consideration of audience, intent of writing is clear and focuses most elements of the work.	Demonstrates awareness of audience, intent of writing can be inferred by the audience and focuses some elements of the work.
Content	Contains the necessary amount of information carefully summarized to convey a clear and informative message to the audience	Contains the necessary information conveying a general message to the audience.	Contains relevant information but not well- focused to accurately convey the message to the audience.
Genre and Disciplinary Conventions	Understands scientific conventions of writing and, skillfully uses appropriate scientific terms. Demonstrates excellent understanding of technical language.	Understands scientific conventions of writing and consistently uses relevant scientific language.	Uses some scientific conventions and is aware of relevant scientific language.

Sources: include published literature	Comprehensively uses published references that are critically analyzed and presented in the appropriate context. Background information is clear and carefully summarized given proper credit to authors in publications. Meticulously uses own words and style avoiding any possible plagiarism.	Comprehensibly uses publishes references that are assumed to be of high quality. Background information is well summarized given proper credit to authors in publications. Uses own words frequently.	Uses most references that provide relevant information. Avoids plagiarism.
Results: includes data from research and in the form of figures, tables, images.	Logically presents high quality data that is comprehensive, informative, cohesive and skillfully integrated. Appropriate data is properly analyzed and adheres to scientific standards.	Presents high quality data that is well integrated. Data is well presented and properly analyzed.	Presents sufficient data and properly analyzed. Presentation is adequate.
Discussion	Demonstrates comprehensive knowledge of the topic by carefully integrating validated information with results from own research. Conveys a strong message that is fully supported by results.	Demonstrates broad knowledge and is capable of integrating validated information with results from own research. Conveys a general message about research	Demonstrates relevant knowledge and relevance of the research is apparent. Integration of literature and own work adequate. General message lacks depth.

PROBLEM SOLVING AND CRITICAL THINKING RUBRIC

ADAPTED FROM AACU RUBRICS ON PROBLEM SOLVING, INQUIRY AND ANALYSIS AND CREATIVE THINKING

Definition

The systematic process of exploring issues, objects or works through the collection and analysis of evidence that results in a clear statement of the problem leading to the development of hypotheses and objectives, effective and reasonable experimental approaches, insightful analysis of data and an informed interpretation of the resulting conclusions or judgments.

Evaluators are encouraged to assign a one to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone By Graduation	**Milestones By Midpoint/Candidacy**	**Benchmark By Entrance Seminar**
Define Problem Reflects an understanding of the context in terms of current knowledge	Demonstrates the ability to construct a clear and insightful problem statement with evidence of all relevant literature and observations.	Demonstrates the ability to construct a clear problem statement with evidence of most relevant literature and observations.	Demonstrate adequate ability to construct a problem statement with evidence of most relevant literature and observations, but problem statement is superficial.
Hypotheses	Proposes one or more hypotheses that indicates a deep comprehension of the problem. Hypotheses address all relevant literature and observations, and relations between hypotheses are strong.	Proposes one or more hypotheses that indicates comprehension of the problem. Hypotheses address most of the relevant literature and observations, but relations between hypotheses are weak	Proposes one hypothesis that is superficial rather than designed to address the relevant literature and observations of the problem.

Experimental Approach	Clear objectives are proposed for each hypothesis. Appropriate methodologies are adopted from across disciplines. All necessary treatments and controls areincluded. Analysis is appropriate and well thought out. All experiments are feasible in terms of time, effort, facilities and cost. Schedule of experiments well developed. Likely problems with experiments anticipated and contingencies outlined.	Objectives proposed for each hypothesis mostly clear. Methodology is appropriately developed, however, more subtle aspects are ignored. Most necessary treatments and controls are included. Analysis is appropriate, but needs more detail. Most experiments are feasible in terms of time, effort, facilities and cost. Schedule of experiments mostly developed. Some problems with experiments anticipated.	Objectives proposed for hypothesis mostly clear. Elements of the methodology are poorly developed, or unfocused. Most necessary treatments and controls are included. Analysis vague. Experimental pitfalls not anticipated.
Interpretation of Results, Limitations, and Implications	Clear understanding of how results relate to the hypothesis, the other hypotheses and to the stated problem. Insightfully discusses in detail relevant and supported limitations and implications of the research. Demonstrates a clear understanding of future research direction.	Some understanding of how results relate to individual hypothesis and to the stated problem, but not necessarily to the other hypotheses. Discusses relevant and supported limitations and implications of the research. Demonstrates some understanding of future research direction.	Has a superficial understanding of how results relate to individual hypotheses and to the stated problem. Presents relevant and supported limitations and implications. Can suggest possible future research direction.

Appendix 4
Entomology Courses

ENTO 1021L. Insects, Science and Society Lab. 1 Hour.
To educate students on the importance of insects in biology and science, human and animal medicine, ecosystems, agriculture, pollination, genetic research, the arts, and human culture and history. The lab will be a hands-on approach to reinforcing entomological concepts addressed in lecture. Corequisite: ENTO 1023. (Typically offered: Fall and Spring)

ENTO 1023. Insects, Science and Society. 3 Hours.
To educate students on the importance of insects in biology and science, human and animal medicine, ecosystems, agriculture, pollination, genetic research, the arts, and human culture and history. Corequisite: ENTO 1021L. (Typically offered: Spring)

ENTO 3011L. Introduction to Insect Identification Lab. 1 Hour.
Introductory lab course on insect identification, collection, and curation techniques, primarily designed as an intensive add-on to ENTO 3013 for students wanting a more in-depth examination of insect diversity. Insect collection required. Course includes field trips. Students are encouraged to contact instructor before enrolling. Pre- or Corequisite: ENTO 3013. (Typically offered: Fall)
This course is cross-listed with BIOL 3011L.

ENTO 3013. Introduction to Entomology. 3 Hours.
Fundamentals of insect biology including structure and function, development, ecology, behavior, plant feeding and disease transmission. Lecture 3 hours/week. Students interested in a more intensive examination of insects, including collection, curation, and identification techniques, should sign up for the separate one credit lab ENTO 3011L. Students are strongly encouraged to take BIOL 1543 before registering for this course. (Typically offered: Fall)
This course is cross-listed with BIOL 3013.

ENTO 400V. Special Problems. 1-4 Hour.
Special problems. (Typically offered: Fall, Spring and Summer)

ENTO 4013. Insect Behavior and Chemical Ecology. 3 Hours.
Basic concepts in insect senses and patterns of behavioral responses to various environmental stimuli. Previous knowledge of basic entomology is helpful, but not required. Lecture 2 hours, laboratory/discussion 2 hours per week. Corequisite: Lab component (Typically offered: Spring Even Years)
This course is cross-listed with BIOL 4013.

ENTO 4024. Insect Diversity and Taxonomy. 4 Hours.
Principles and practices of insect classification and identification with emphasis on adult insects. Corequisite: Lab component. Prerequisite: ENTO 3013. (Typically offered: Fall Even Years)
This course is cross-listed with BIOL 4024.

ENTO 4043. Honey Bee Biology and Beekeeping. 3 Hours.
To acquaint the student with social insects in general and honey bees in particular, to promote an interest in beekeeping as a hobby, occupation, and/or science, to give the students the basic knowledge of how to keep honey bees, and to increase awareness of the contribution that pollinating insects make to agriculture, natural ecosystems, and human life. Lecture 3 hours, plus beekeeping field day. (Typically offered: Spring)

ENTO 4053. Insect Ecology. 3 Hours.
To develop understanding of important ecological concepts through study of dynamic relationships among insects and their environment. To become familiar with the literature of insect ecology, and interpretation and critique of ecological research. Previous knowledge of basic entomology and/or

ecology will be assumed. Corequisite: Lab component. (Typically offered: Fall Even Years)
This course is cross-listed with BIOL 4053.

ENTO 410V. Special Topics. 1-3 Hour.
Topics not covered in other courses or a more intensive study of specific topics in entomology. (Typically offered: Irregular) May be repeated for degree credit.

ENTO 4123. Insect Pest Management. 3 Hours.
Study of principles and concept of insect pest management. Areas covered include survey of arthropod pests and damage, population dynamics, damage thresholds, physiological units, prediction models, surveillance, arthropod sampling, strategies and tactics utilized to maintain pest populations below economic injury levels. Prerequisite: ENTO 3013. (Typically offered: Spring Odd Years)

ENTO 4133. Advanced Applied Entomology. 3 Hours.
Biology and ecology of major arthropod pests as model applied management systems. Activities include independent study, literature review and group discussions. Knowledge of general entomology and pest management is required. Self-learning modules are available. Lecture 2 hours/week and direct self-study laboratory 2 hours/week. Corequisite: Lab component. Prerequisite: ENTO 3013. (Typically offered: Spring Even Years)

ENTO 500V. Special Problems. 1-4 Hour.
Special problems. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 4 hours of degree credit.

ENTO 5013. Morphology of Insects. 3 Hours.
Origin, evolution, and functional significance of external insect structure. Structure and function of major internal systems. Previous knowledge of basic entomology is helpful, but not required. Lecture 2 hours, laboratory 4 hours per week. Corequisite: Lab component. (Typically offered: Fall Odd Years)

ENTO 5024. Insect Diversity and Taxonomy. 4 Hours.
Principles and practices of insect classification and identification with emphasis on adult insects. 2.5 hours lecture, 4 hours lab. Prerequisite: ENTO 3013 or instructor consent. Corequisite: Lab component. (Typically offered: Fall)
This course is cross-listed with BIOL 5024.

ENTO 5043. Honey Bee Biology and Beekeeping. 3 Hours.
To acquaint the student with social insects in general and honey bees in particular, to promote an interest in beekeeping as a hobby, occupation, and/or science, to give the students the basic knowledge of how to keep honey bees, and to increase awareness of the contribution that pollinating insects make to agriculture, natural ecosystems, and human life. (Typically offered: Spring)

ENTO 5053. Insect Ecology. 3 Hours.
To develop an understanding of important ecological concepts through study of dynamic relationships among insects and their environment. To become familiar with the literature of insect ecology, and interpretation and critique of ecological research. Previous knowledge of basic entomology and/or ecology will be assumed. 2 hours lecture/2 hours lab. Prerequisite: Instructor consent. Corequisite: Lab component. (Typically offered: Fall Even Years)
This course is cross-listed with BIOL 5053.

ENTO 510V. Special Topics. 1-3 Hour.
Topics not covered in other courses or a more intensive study of specific topics in entomology. (Typically offered: Irregular) May be repeated for degree credit.

ENTO 5113. Insect Behavior and Chemical Ecology. 3 Hours.

Basic concepts in insect senses and patterns of behavioral responses to various environmental stimuli. Previous knowledge of basic entomology is helpful, but not required. Prerequisite: Instructor consent. Corequisite: Lab component. (Typically offered: Spring Even Years)
This course is cross-listed with BIOL 5113.

ENTO 5123. Biological Control. 3 Hours.
Theoretical and practical basis for biological control of arthropod pests and weeds via parasites, predators, and pathogens. Lecture 2 hours, laboratory 2 hours per week. Corequisite: Lab component. (Typically offered: Fall Odd Years)

ENTO 5133. Insect Molecular Genetics. 3 Hours.
A hands on course in insect molecular genetic techniques including molecular diagnostics and population genetics. Students will learn how to apply advanced molecular genetic methodologies and Internet database resources to insects that they are using for their graduate research. (Typically offered: Spring Even Years)
This course is cross-listed with BIOL 5133.

ENTO 5153. Insect Pest Management. 3 Hours.
Study of principles and concept of insect pest management. Areas covered include a survey of arthropod pests and damage, population dynamics, damage thresholds, physiological units, prediction models, surveillance, arthropod sampling, strategies and tactics utilized to maintain pest populations below economic injury levels. Prerequisite: Instructor consent. (Typically offered: Spring Odd Years)

ENTO 5163. Advanced Applied Entomology. 3 Hours.
Topics will include the integration of tactics, integration of disciplines and specific case histories in insect management, or use of insects to manage weeds. Prerequisite: Instructor consent. (Typically offered: Spring Even Years)

ENTO 600V. Master's Thesis. 1-6 Hour.
Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ENTO 6071. Seminar. 1 Hour.
Fall: special topics not covered in regular course work. Spring: critical review of research papers in entomology. Seminar will be taken by graduate student majors for both semesters. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

ENTO 6113. Insect Physiology and Molecular Biology. 3 Hours.
Overview of insect physiology and modern molecular techniques to study physiological processes. Previous knowledge of basic entomology is helpful, but not required. Two lectures per week (1 hour 20 minutes each). (Typically offered: Spring Even Years)
This course is cross-listed with BIOL 6113.

ENTO 700V. Doctoral Dissertation. 1-18 Hour.
Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Appendix 5
Plant Pathology Courses

PLPA 5001. Seminar. 1 Hour.
Review of scientific literature and oral reports on current research in plant pathology. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 4 hours of degree credit.

PLPA 502V. Special Problems Research. 1-6 Hour.
Original investigations of assigned problems in plant pathology. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

PLPA 504V. Special Topics. 1-18 Hour.
Lecture topics of current interest not covered in other courses in plant pathology or other related areas. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

PLPA 5123. Bacterial Lifestyles. 3 Hours.
The course will introduce students to bacteria as prokaryotic organisms, different from eukaryotes such as plants and animals. Model microbial systems will be studied in more detail to identify unique strategies that bacteria employ to thrive in their respective environment, whether they are causing diseases or establishing beneficial interactions with animal or plants or coexisting with other microorganisms in diverse ecological environments. The course will also cover special adaptations that bacteria have evolved to adapt to harsh environments and how these adaptations can be harnessed to control pollution. Prerequisite: (BIOL 2013 and BIOL 2011L) or BIOL 3123. (Typically offered: Spring Odd Years)
This course is cross-listed with BIOL 5223.

PLPA 5223. Plant Disease Control. 3 Hours.
Principles, methods and mechanics of plant disease control. Emphasis is given to the integration of control measures and epidemiology of plant diseases. Lecture 3 hours per week. Graduate degree credit will not be given for both PLPA 4223 and PLPA 5223. (Typically offered: Fall)

PLPA 5303. Advanced Plant Pathology: Host-Pathogen Interactions. 3 Hours.
Presentation of important contemporary concepts relative to disease resistance and the physiology, biochemistry, and molecular biology of plant-pathogen interactions. Lecture 3 hours per week. Prerequisite: PLPA 3003 or equivalent and graduate standing. (Typically offered: Spring Odd Years)

PLPA 5313. Advanced Plant Pathology: Ecology and Epidemiology. 3 Hours.

Presentation of important contemporary concepts relative to the ecology and epidemiology of foliar and soil-borne plant pathogens. Lecture 3 hours per week. Prerequisite: PLPA 3003 and graduate standing. (Typically offered: Spring Even Years)

PLPA 5324. Applied Plant Disease Management. 4 Hours.
A plant pathology course emphasizing practical understanding of the concepts and principles of agronomic and horticultural crop disease management, including disease diagnosis, monitoring, and using models to forecast disease events. Graduate degree credit will not be given for both PLPA 4304 and PLPA 5324. (Typically offered: Irregular)

PLPA 5333. Biotechnology in Agriculture. 3 Hours.
Discussion of the techniques, applications, and issues of biotechnology as it is being used in modern agriculture. Coverage includes the basics of molecular biology, production of transgenic plants and animals, and new applications in the agricultural, food, and medical marketplace. Lecture and discussion, 3 hours per week. Graduate degree credit will not be given for both PLPA 4333 and PLPA 5333. (Typically offered: Fall)

PLPA 5404. Diseases of Economic Crops. 4 Hours.

Diagnosis and management of important diseases of cotton, fruits, rice, trees, soybeans, wheat, and vegetables will be covered in a lecture, laboratory, and field format. Lecture 2 hours, laboratory 4 hours per week. Four 1-day field trips will be involved. Corequisite: Lab component. Prerequisite: PLPA 3003. (Typically offered: Summer)

PLPA 5603. Plant Pathogenic Fungi. 3 Hours.

Plant Pathogenic Fungi is structured as an integrated lecture/laboratory class designed for students that are interested in developing an understanding and appreciation for taxonomy, biology, and ecology of plant pathogenic fungi and related saprophytic fungi. Corequisite: Lab component. Prerequisite: PLPA 3003 or graduate standing. (Typically offered: Fall Odd Years)

PLPA 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PLPA 6203. Plant Virology. 3 Hours.

Lecture emphasizing discussion of recent advances in plant virology. Laboratory concerned with techniques and equipment used in plant virus studies, Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: CHEM 5813 or CHEM 5843 or CHEM 6873 or consent of instructor. (Typically offered: Fall Even Years)

PLPA 6503. Plant Bacteriology. 3 Hours.

Current concepts and techniques in plant bacteriology, including taxonomic, ecological and molecular aspects of plant pathogenic bacteria and their interactions with hosts. Lecture 2 hours, laboratory 2 hours per weeks. Corequisite: Lab component.
Prerequisite: BIOL 2013 and BIOL 2011L. (Typically offered: Spring Odd Years) May be repeated for up to 3 hours of degree.