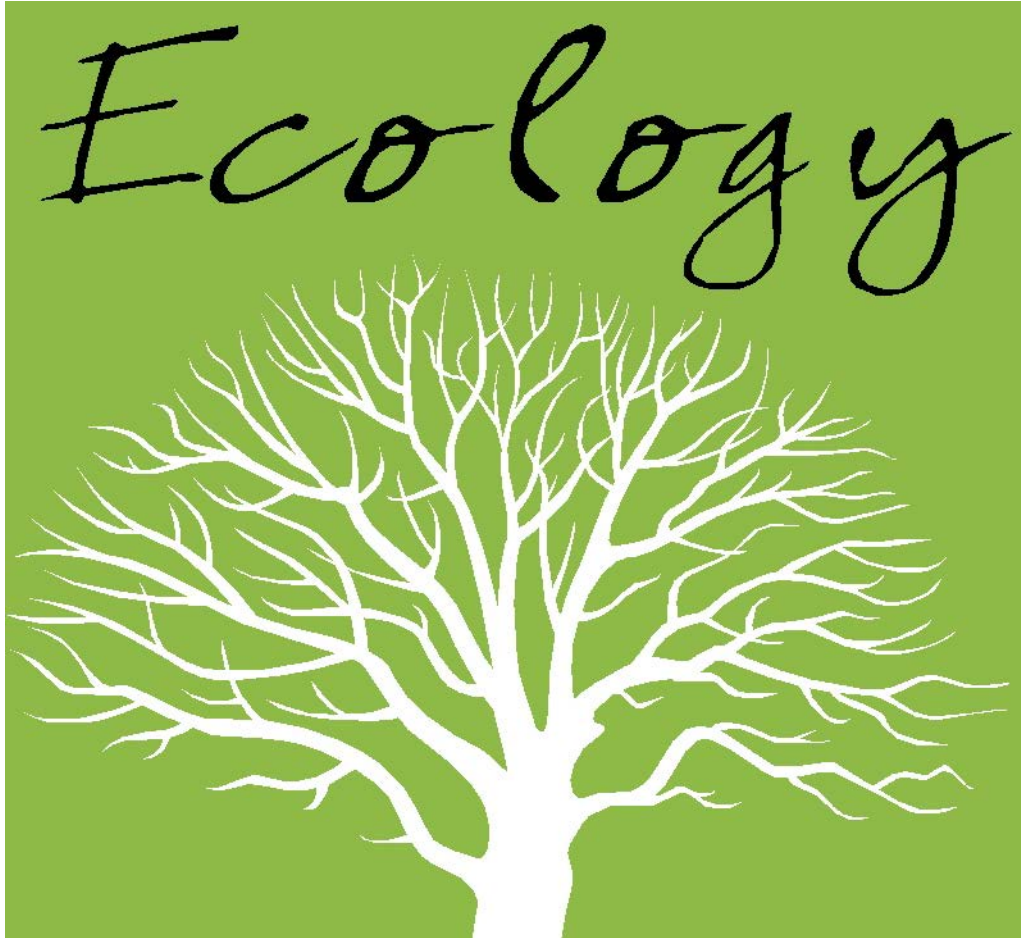


Intercollege Graduate Degree Program in Ecology



Handbook

2014/2015

The Pennsylvania State University

<http://www.huck.psu.edu/education/ecology>

CONTACTS

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If a graduate student has issues or complaints concerning his/her advisor, the student may speak in confidence to David Eissenstat (dme9@psu.edu, 863-3371) or contact the Graduate School Dean's Office (865-2516).

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SECTION I

GENERAL POLICIES

A. **Mission Statement:**

The mission of the Intercollege Graduate Degree Program in Ecology is to educate and train scientists with respect to both basic and applied aspects of ecology. Research and teaching in the program focus primarily on interactions between organisms and their environments, ranging from the molecular to the biosphere level.

B. **Ecology as an Intercollege Program**

An intercollege program is characterized principally by the fact that the faculty members participating in the program reside in several departments and colleges, and that the students in the program draw significantly upon the resources of several departments – their courses, faculties and facilities. For each intercollege program, a Program Chair is appointed by the Dean of the Graduate School with the concurrence of the appropriate deans and departmental heads/directors.

The Ecology Program is part of the Huck Institutes of the Life Sciences which is dedicated to encouraging new perspectives across disciplinary boundaries. The Huck Institutes catalyze innovation and excellence in interdisciplinary research and education in the life sciences at Penn State.

Each program is the responsibility of the participating departments and an intercollege graduate faculty with academic background, interest and demonstrated scholarship in areas pertaining to the program. In matters concerning the Intercollege Graduate Degree Program, the Chair reports to the Dean of the Graduate School.

C. **Responsibilities of the Student, Thesis Advisor and Student's Committee**

Students are expected to assume responsibility for knowing the regulations and requirements of the Graduate School and the Ecology Program as described in:

- (1) Graduate Degree Programs Bulletin: <http://bulletins.psu.edu/bulletins/whitebook/>
- (2) Thesis Guide: <http://www.gradschool.psu.edu/current-students/etd/>
- (3) This Ecology Program Handbook
- (4) Ecology Program Requirements
<http://www.huck.psu.edu/education/ecology/degree-requirements>

Thesis advisors and graduate committees have a responsibility for judicious timing of events to avoid prolonging degree programs. For example, in the initial months of residence, students may become preoccupied with course work. At this time, a student should also be outlining the entire program, choosing a thesis topic, and drawing up research plans. Delays may result in time added to degree completion or

under-accomplishment of thesis research. The leadership efforts of thesis advisors and committee members are needed to forestall such delays.

SECTION II

STUDENT-FACULTY RELATIONSHIPS AND GRADUATE STUDENT COMMITTEE

Office and research space, course work and research plans will be arranged through the student's advisor and cooperating department. A graduate committee should be appointed early enough in the student's tenure to be involved in the course and research planning. The graduate student's committee is responsible for approving a student's program and promoting communication between the graduate student, the committee chair (or advisor), and the members of the committee, and more generally, for helping to ensure successful completion of a student's program. Informal meetings of the student with individual committee members and with the committee as a group are encouraged as a means of aiding the student in thesis research and of keeping the faculty aware of the student's progress. The student should arrange to have the committee meet at least once per year, to receive guidance, finalize and approve the research proposal, assess the quality and progress of the research and discuss programmatic issues and course requirements. **A committee should be formed by the end of the first year for M.S. students and by the end of the 2nd year for PhD students.**

The committee is chosen by the student with guidance from an advisor. The student should meet with the desired faculty members and determine if they are willing to serve. After getting verbal commitments, the student should contact the Huck Graduate Program Office so that the necessary paperwork can be prepared. When you receive the appointment sheet from the Huck Graduate Programs Office, you should sign it and then gather the signature of each of your committee members. It is your responsibility to obtain the signatures, and the appointments cannot be made until the sheet is fully signed. The appointment sheet must then be returned to the Huck Graduate Programs Office for final processing. The Graduate School will make the formal appointment of the committee members for Ph.D. students. This will take a minimum of three weeks after the Graduate School has received all the necessary documents. **Note that the committee must be formally appointed by the Graduate School before a Comprehensive Exam can be scheduled.**

Changes in Committee Membership

For various reasons, it may occasionally become necessary to make changes in committee membership. To make any changes to an appointed committee, contact the Huck Graduate Programs Office.

To add a member, the student must inform the Office of the name of the person and in what capacity he or she will serve. A revised appointment sheet must be prepared, and

signatures will be needed from the new member, the Program Chair, and the student. This sheet must be returned to the Office for final processing.

To remove a member, a revised appointment sheet must also be prepared and signed by the student and the Program Chair. In order to maintain the required committee membership, it is likely that a new member will need to be added to replace the member being removed.

It will take a minimum of two weeks after the Graduate School has received all the documents before changes in committee membership become finalized.

- A. Doctoral committee:** A doctoral committee consists of at least 4 members of the Graduate School Faculty <http://www.gradschool.psu.edu/faculty-and-staff/faculty-list/>:
- a chair (typically the advisor)
 - one or more additional members of the Ecology faculty
<http://www.huck.psu.edu/education/ecology/faculty-and-research>
 - an outside FIELD member. This person may or may not be a member of the Ecology faculty but must represent a field outside the student's major field of study. Please contact the Program Office for advice on selecting an outside field member
 - an outside UNIT member. This person must have a primary appointment in a different administrative unit than the advisor (and co-advisor, if applicable). Please contact the Program Office for advice on selecting an outside unit member
 - at least half of the members must be from the Ecology Program
 - guidelines regarding doctoral committees can be found in the Graduate Degree Programs Bulletin:
http://bulletins.psu.edu/bulletins/whitebook/degree_requirements.cfm?section=degreeReq1#doctoralAdvisers
- B. Master's committee:** Master's students are not required to report their committee members to the Graduate School. Instead, the committee is reported to the Ecology Program office on the academic course plan
<http://www.huck.psu.edu/education/ecology/degree-requirements/ecology-graduate-academic-course-plan.pdf/view>. A Master's committee consists of:
- a Chair (typically the advisor)
 - two other faculty members
 - at least two members must be from the Ecology Program faculty and as many as three may be members of the program.

SECTION III

DEGREE REQUIREMENTS

A. Ecology Course Requirements* and SARI (Scholastic and Research Integrity)

1a) Advances in Ecology (ECLGY 515) All Ph.D. and Master's students need to successfully complete Advances in Ecology. Advances in Ecology must be taken during the first fall semester of enrollment in order to fulfill the SARI instructional module.

1b) SARI online module All Ph.D. and Master's students need to successfully complete the online component of the SARI course during their first semester of study.

First year students should register for the online CITI (Collaborative Institutional Training Initiative) RCR (Responsible Conduct of Research) course as soon as possible in the fall semester. To register, go to the Penn State SARI website, Online Training Program page (<http://www.research.psu.edu/training/sari/program>) where you will find instructions and a link for the CITI Program website (<http://www.citiprogram.org>). Choose Pennsylvania State University as the participating institution and register for the CITI **Biomedical Sciences** course.

Students must work on their own to complete the course modules and pass the on-line quizzes. The test takes several hours to complete and can be taken in advance of or simultaneously with ECLGY 515 (597B). All modules must be completed by the end of the first semester, and a copy of the student's Completion Report must be submitted to the ECLGY 515 instructor and Program Office by the last day of classes of the fall semester.

2) Classical Ecology (ECLGY 510) All Ph.D. students need to successfully complete Classical Ecology. Classical Ecology is offered in the fall semester and should be taken during the first year of study. Master's students may take Classical Ecology at the recommendation of their advisor and with the approval of the course instructor on a space available basis.

3) All Ph.D. and Master's students need to successfully complete a course from 2 of the following 3 categories. At least 2 courses totaling at least 6 credits and covering at least 2 categories must be taken. *

Molecular, Physiological, Behavioral, and Evolutionary Ecology

- BIOL 406 Symbiosis (spring)
- BIOL 446 Physiological Ecology (spring)
- ENT 597B Concepts and Techniques in Molecular Ecology
- ENT 597D Insect Chemical Ecology (fall, even)
- ERM 444 Environmental Biophysics (spring, odd)
- HORT 445 Plant Ecology (fall)
- HORT/PLBIO 514 Modern Techniques and Concepts in Plant Ecophysiology (spring)

- HORT 517 Ecology of Plant Roots (fall, odd)
- SOILS 512 Environmental Microbiology (spring)

Population and Community Ecology

- AGRO 510 Ecology of Agricultural Systems (spring)
- BIOL 412 Ecology of Infectious Diseases (fall)
- BIOL 482 Coastal Biology (spring)
- BIOL 519 Ecological and Environmental Problem Solving (spring, even)
- ENT 420 Introduction to Population Dynamics (fall, odd)
- FOR 508 Forest Ecology (spring, even)
- W F S 560 Population Estimation and Modeling

Ecosystem, Landscape, and Global Ecology

- ERM 435/W F S 435 Limnology (fall)
- GEOG 411W Forest Geography (fall, odd)
- GEOG 414 Landscape Ecology (spring)
- GEOG 497A Global Change Ecology
- GEOG 510 Tropical Forest Dynamics (spring)
- GEOG 597_ Wetland Ecology and Management (spring)
- SOILS 571 Ecosystem Nutrient Cycles (fall, odd)

Other Ecology related courses that students have found helpful can be found on the Ecology website at: <http://www.huck.psu.edu/education/ecology/degree-requirements/courses>

All graduate students are required to be registered for **9 credits** per semester to be considered full-time while on a fellowship or assistantship. It is not recommended to register for more than 12 credits per semester.

B. Statistics Requirement*

1. For the Master's student, at least one advanced course (400 – 500-level) or an equivalent course from a previous institution beyond an introductory statistics course (e.g. STAT 451 is not appropriate).
2. For the Ph.D. student, at least two advanced courses (400-500-level) or equivalent courses from a previous institution beyond an introductory statistics course (e.g. STAT 451 is not appropriate).

**Note that one or more of these course requirements can be waived if a course of equivalent material was taken at an approved institution. Decisions are made on a case-by-case basis by petitioning the Curriculum Committee and supplying the syllabus of the course wishing to be substituted.*

C. Colloquium Requirement

1. Two semesters for a Master's student and four semesters for a Ph.D. student are required in Ecology Colloquium (ECLGY 590). Colloquium is a 1-credit seminar class intended to provide Ecology graduate students an opportunity to present their research to their peers. All presentations need to have some type of ecological context. Goals of the class are: (1) to provide practice and feedback for communicating research in a scientific forum and (2) allow for critique of research ideas and results in a constructive fashion.

2. Despite these minimum requirements, regular participation is expected regardless of official registration. Communication with colleagues is an essential part of the scientific process.

3. An oral presentation at a National or International Scientific Meeting may be substituted for a Colloquium presentation (one presentation for Ph.D. students).

- The student must obtain approval for this substitution from the Colloquium Instructor.
- The substitution should take place during the semester of (or immediately following) the meeting presentation.
- The student must register for and attend Colloquium during that semester.

D. Seminar and Mini-symposium Requirements

Each student will be required to present a formal **Ecology seminar** on his/her research before degree certification. This seminar must be given *before* the student takes the final oral examination. The seminar is open to the public and often is the final talk of the Colloquium experience, but may be a separate 30-40 minute talk.

In addition, a short talk should be arranged with the Program Office as part of the **Mini-Symposium**. It is the student's responsibility to notify the Program Office prior to the Fall or Spring Mini-Symposium, to be included in the program.

E. Teaching Experience

The purpose of this requirement is to provide the Ph.D. student a meaningful teaching experience and to develop teaching techniques. Master's students are not required to fulfill a teaching requirement.

1. *Setting up the supervised teaching experience:* Discuss the teaching requirement ahead of time with the advisor and consider which course is appropriate to obtain this experience. Students should be familiar with course subject material, and the course instructor must be willing to supervise the teaching experience. Contact the course instructor ahead of time and discuss the expectations and activities which will provide a meaningful teaching experience. Register for IBIOS 602 (or ECLGY 602 when it becomes available) during the semester of the supervised teaching experience. A

minimum of 1 credit of supervised teaching is required, but depending on involvement, up to 3 credits may be registered.

2. *Can this requirement be met through regular TA assignments?* If the teaching experience is part of the teaching assistantship assignment, request assignment to the course where supervised teaching is to be conducted.
3. *Guidelines:* Students should have direct teaching experience. This means involvement in several types of activities crucial to teaching. Examples include designing, setting up, and/or running laboratory sessions, writing and presenting a couple of lectures, designing quizzes or questions for exams and grading them, leading discussion sessions, and helping develop modifications of the course. An assignment involving only the grading of tests, taking attendance, and cleaning labs is contrary to the purpose of this experience. An important aspect of a quality teaching experience is constructive feedback from the mentor(s). The responsibility for this feedback rests with the supervisor (instructor for the course). The instructor can use student evaluations and/or his/her own evaluations and observations as sources of information. Ideally, the supervisor will provide suggestions on how to improve performance. Upon completion of the teaching experience, the instructor will assign a letter grade in IBIOS/ECLGY 602.

F. Graduate Academic Course Plan

Each Ph.D. and Master's graduate student in consultation with his or her research advisor and thesis committee must submit a graduate Academic Course Plan to the Program Office. This is available as a pdf file at:

<http://www.huck.psu.edu/education/ecology/degree-requirements/ecology-graduate-academic-course-plan.pdf/view>

G. Examinations

1. Both Master's and Ph.D. Students

Each student must pass a final oral **thesis defense** before degree certification. The final oral examination for the Ph.D. student must be scheduled by the Program Office with the Graduate School at least two weeks in advance of the exam date. Therefore, the student should contact the Program Office at least three weeks before the requested defense date in order to have the proper forms completed. The Ph.D. student's advisor must inform the Graduate School and the Program Office about the outcome of the final oral thesis defense using the form provided by the Graduate School via the Program Office.

The Master's student's advisor must inform the Program Office in writing about the outcome of the final oral thesis defense using the form provided by the Program Office. This form should be requested from the Program Office at least 2 weeks prior to the defense date.

2. Ph.D. Students only

- a) A **candidacy examination** is required of all Ph.D. students. (For details see “Guidelines for Doctoral Candidacy Examinations,” p. 16 of this handbook). The examining committee is appointed by the Program Chair. The Candidacy Exam consists of both a written and an oral component. The Chair of the Candidacy Committee must inform the Program Office in writing about the outcome of the Candidacy Exam. The outcome of the Candidacy Exam is sent by the Program Office to the Graduate School.

The exam should be taken in the second or third semester of the Ph.D. program. It is the responsibility of the graduate student to contact the Chair of the Candidacy Examination Committee to schedule his/her exam. When requested by the Chair of the Candidacy Examination Committee, the student shall provide the following information: name, advisor’s name, campus address, telephone number, e-mail address, date of entry into the program and a copy of the semester course schedule. If a dual-title student is taking the exam, a representative of the dual-title program must be present on the Candidacy Committee for that exam.

- b) The **Comprehensive Examination** for the Ph.D. will be a rigorous examination administered by the student’s committee as early as possible in the student’s tenure but after the Candidacy exam. An oral examination is required. The committee may also choose to require a written examination. The Comprehensive Exam should cover aspects of advanced ecology and related disciplines necessary to the student’s field of specialization. The Comprehensive Examination must be scheduled by the Program Office with the Graduate School at least two weeks in advance of the exam date. Therefore, the student should contact the Program Office at least three weeks before the requested defense date in order to have the proper forms completed. The student must be registered during the semester of the Comprehensive Exam, including summer.

H. English Competency Policy for Ph.D. Students

Ph.D. students are required to demonstrate a high level of competence in the use of the English language. Written and speaking competence in English will be assessed by the Candidacy Examination Committee at the Ph.D. Candidacy Exam.

I. Thesis Research – Grade Reporting

Students can be assigned letter grades for thesis research (ECLGY 600 on campus, ECLGY 610 off campus) credits for a total number of 6 credits for Master’s and 12 credits for Doctoral candidates. Any research credits over this number must be assigned an R grade.

J. Thesis Preparation

Doctoral candidates can register for special non-credit thesis preparation work (ECLGY 601 full-time, ECLGY 611 part-time); however, such candidates must have passed the Comprehensive Examination and must have met the two-semester residence requirement (see checklist for Ph.D. candidates, p. 18).

K. Registration near Completion of a Program

A Master's candidate is **not** required to register for the final semester in order to graduate or in order to make minor revisions to the thesis and/or to take a final examination for the degree.

A Ph.D. candidate is required to register continuously (spring/fall) for each semester from the time the comprehensive examination is passed and the two-semester residence requirement is met until the thesis is accepted by the doctoral committee, including the semester of the comprehensive exam and the semester of the final oral exam, regardless of whether work is being done on the thesis during this interval. **A doctoral student must register for at least one credit if he/she plans to take the final exam during the summer semester.**

L. Non-Thesis Option

There is no longer a non-thesis option available to Master's students in the Ecology Program.

M. Thesis Copy Requirements

Master's and Ph.D. students must submit a properly formatted electronic copy of the thesis to the Graduate School Thesis Office by the deadlines for the semester in which they intend to graduate (see pg. 19/20 of this handbook for more details). In addition, an **electronic** copy of the thesis must be submitted to the Ecology Program Office where it will be kept on file after the student has received the degree. The Ecology Program does not require a **hard-bound** copy of the thesis but the student's major advisor may wish to receive a bound copy. Therefore, the student should check with the advisor when ordering hard-bound copies.

N. Exit Survey

All Ecology Program students are required by the Program to complete an exit survey before leaving Penn State, and to schedule a short interview with the Program Chair. The exit survey form is available from the Program Office. The Graduate School also offers an exit survey: <http://www.gradschool.psu.edu/faculty-and-staff/forms/ges/>.

O. Resume Study/Change of Graduate Degree or Major

Master's students in Ecology who are interested in continuing on for a Ph.D. in Ecology must submit an application for permission to resume graduate study. A form to resume graduate study is available from the Program Office or from the Graduate School's website: <http://www.gradschool.psu.edu/forms-and-documents/ges-owned-forms-and-documents/reschg2pdf/>.

This same form is used by Ph.D. students who need to change their degree to M.S. Approval by the Program Chair and major advisor is required before making this change.

Current Penn State graduate students may use this form to change their degree or major to Ecology upon approval of the Ecology Admissions Committee.

P. Options in Ecology

A Dual-title Ph.D. Degree program in Biogeochemistry as well as other specialized Program Options are available to Ecology graduate students. Please see the Ecology website for current Program Options: <http://www.huck.psu.edu/education/ecology/degree-requirements/options>.

Q. Minor in Ecology

A Master's or Ph.D. student in another degree program may elect a minor in Ecology. Six credits are required for a Master's minor and 15 credits for a Ph.D. minor in Ecology. An application form is available from the Program Office to notify the Graduate School of a student's intent to declare a minor. Prior to week 12 of the student's semester of graduation, the Program Office must notify the Graduate School that minor requirements have been met.

APPLICATION PROCEDURES AND ADMISSION CRITERIA

A. Application Procedures

A pre-application form can be found on the Ecology Program website at:

<http://www.huck.psu.edu/education/ecology/preapplication>

Complete the **online Penn State Graduate School application form** at <http://www.gradschool.psu.edu/admissions/> (you may want to open this link in a new window). A graduate degree in Ecology is only available at the University Park campus.

Make sure you pay the **application fee. Applications without fee payment cannot be processed.** You can pay the fee online by credit card (follow the instructions associated with the online Graduate School application form). If you are unable to pay online, see the instructions to send payment by check or money order on the Application Fee Form (<https://secure.gradsch.psu.edu/payportal/frontpage.cfm>).

B. Selection of Students

Students will be selected by an Admissions Committee on the basis of overall promise for graduate work.

Requirements for admission shall be:

- (1) A minimum undergraduate grade point average of 3.0 for combined junior and senior years.
- (2) A strong background in at least two of the following areas: Quantitative Science, Physical Science, Life Science, Earth Science, Behavioral Science.
- (3) Satisfactory Graduate Record Examination scores. GRE scores on the verbal and quantitative sections should average in the 50th percentile or higher. The Advanced Biology Test is optional.
- (4) At least three letters of recommendation.
- (5) A statement of educational and career goals.
- (6) **English Proficiency**--The language of instruction at Penn State is English. International applicants must take and submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System). The minimum acceptable score for the TOEFL is 550 for the paper-based test, 213 for the computer-based test, or a total score of 80 with a 20 on the speaking section for the internet-based test. The minimum composite score for the IELTS is 6.5.
- (7) A commitment from an Ecology faculty member to be the student's advisor.

C. Undergraduate Deficiencies

Candidates should have a strong background in basic science and mathematics, including chemistry through organic chemistry, mathematics through calculus, physics, and biology. However, some deficiencies can be addressed in the student's program of study.

EXPECTATIONS AND MILESTONES

Expectations of Master's candidates

- Motivation, curiosity and enthusiasm for science
- General understanding of science in area of concentration including methods and techniques, philosophy and state of knowledge
- Be able to use basic statistics, sampling and experimental design
- Be able to communicate well in either written or oral format

Suggested Milestones for Master's (should be discussed with advisor)

- Course work plan – 1st semester
- Research plan – 2nd semester; present in Colloquium
- Maintain steady progress on research. Try to reach milestones for remaining year.
- Leave at least 1 full semester for data analysis and writing
- Plan to submit at least one paper for publication at the time of graduation with a second close to submission.

Expectations for Ph.D. candidates

- Motivated to become a professional scientist
- Broad knowledge of philosophy, history and present state of knowledge in discipline
- Have a broad understanding of ecological techniques, especially in specialty but basic understanding of 'standard' techniques as well
- Expert in specialty. Student may know more than advisor in specific area of dissertation.
- Must have well-developed ability to think clearly, critically and creatively

Suggested Milestones for a Ph.D. candidate (should be discussed with advisor)

- Coursework plan developed by end of first semester
- Research proposal by end of second semester. If appropriate, submit proposal for funding.
- Candidacy exam taken in 2nd or 3rd semester
- Comprehensive exam taken in 4th or 5th semester
- Maintain steady progress on research
- Submission of one paper for publication before graduation with at least two more near time of graduation. Often a review paper can be submitted as well. If the opportunity presents itself, should try to have at least one co-authored paper.

Expectations of graduate advisor

- Be interested in student's education, welfare, areas of interest and abilities
- Challenge student to achieve but be perceptive to obstacles and handicaps
- Provide broader perspective of science including publishing, grantsmanship, interacting with colleagues, teaching and manuscript review.
- Provide financial support to the extent possible including funds for stipend, tuition, research and travel to meetings and workshops

GUIDELINES FOR DOCTORAL CANDIDACY EXAMINATIONS

University Guidelines: (excerpts)

The candidacy examination is administered by the Graduate Faculty in the major program and should be taken early in the student's program. For the Ph.D. student the examination may be given after at least 18 credits have been earned in the graduate courses beyond the baccalaureate. The examination must be taken within three semesters of entry into the doctoral program. The student must be registered as a full or part-time degree student for the semester in which the candidacy examination is taken.

Ecology Guidelines:

Goals. The candidacy examination is given to evaluate the student's general level of knowledge, to evaluate the intellectual capability for the study of ecology at the doctoral level, and to identify weaknesses in the student's preparation. The examination also will evaluate the student's abilities in problem solving, such as experimental design and interpretation of experimental results. Subject areas to be covered include, but are not restricted to, the contents of basic textbooks in biology, ecology and statistics.

Candidacy Committee. The Program Chair will appoint a four-member Candidacy Committee to administer the examination. If a dual-title student is taking the exam, a representative of the dual-title program must be present on the Candidacy Committee for that exam. The Candidacy Committee will develop written questions covering the general content specified above. An examinee's advisor shall not participate in the administration of the oral examination or the marking of written examinations. However, before a final decision is made regarding candidacy, the advisor will have an opportunity to give input to the Committee.

Examination. The examination will occur in two parts, a written and an oral. The written examination will consist of questions in general biology (e.g. anatomy, physiology, evolution, botany, zoology, microbiology), general ecology, basic statistics, and questions that require some synthesis (e.g. experimental design, explanation of experimental results). This examination will require 3-4 hours of writing time on 6-8 questions. (A laptop computer is recommended.)

The written portion of the examination will be read and graded by the Candidacy Committee. Each student will then be given the oral portion of the examination. The student's responses on the written portion of the examination may serve as the basis for initial oral questioning.

Schedule. Candidacy examinations will be scheduled twice each year. In the fall semester, the written portion of the exam will be scheduled for the last week of October and the oral portion for the second week of November. In the spring semester, the written portion of the exam for the third week of March and the oral portion for the first week of April.

For students entering with a master's degree or a strong background in ecology from their undergraduate institution, the candidacy examination is recommended to be taken during the second semester of study. For students entering with a baccalaureate degree with only one or

two courses in ecology as an undergraduate, the examination will normally be taken during the third semester of study.

Results. The Committee will assign grades based on majority opinion (3 of 4 members) using both the written and oral examination results. Grades will be pass, unsatisfactory, or fail. A student who receives a grade of unsatisfactory may be offered an opportunity to retake the candidacy examination at the next scheduled examination time. For the second examination, only grades of pass or fail will be given. Failure results in the student not being permitted to continue in the Ph.D. program. Typically the student will receive a M.S. degree or a Masters in Ecology. Students receiving a passing grade will be advanced to candidacy.

The examining committee may recommend to the student's advisory committee specific courses or readings based on evidence of weaknesses in the student's preparation. The student's advisory committee will have responsibility for determining the program of study and the content of the comprehensive examination.

CHECKLIST OF REQUIREMENTS FOR MASTER'S STUDENTS

Graduate School Guidelines for Master's students can be found at the following link:
http://bulletins.psu.edu/bulletins/whitebook/degree_requirements.cfm?section=masters.

In summary, in order to graduate, Master's students are required to:

- have at least 30 credits
- have 18 credits at the 500 & 600 level
- have 12 credits in courses in the major (not counting 600/610 courses)
- have no missing or deferred grades
- have at least 6 thesis credits (600 or 610)
- have no more than 6 thesis credits with a letter grade
- submit an electronic copy of the thesis to the Program Office and a hard-bound copy to the advisor, if required by the advisor. (These copies are in addition to the electronic submission required by the Grad School; <http://www.gradschool.psu.edu/current-students/etd/>)

CHECKLIST OF GRADUATE SCHOOL REQUIREMENTS FOR PH.D. CANDIDATES

Following is a summary of requirements that Ph.D. students must meet before the Graduate School may approve their graduation. Please use this summary as a guide for advising your students. For more detailed information on these and other requirements, please refer to the Graduate Degree Programs Bulletin (<http://bulletins.psu.edu/bulletins/whitebook/index.cfm>).

- **Residence requirement.** Over some twelve-month period during the interval between admission to the Ph.D. program and completion of the Ph.D. program, the candidate must spend at least two semesters (summer sessions are not included) as a registered full-time student engaged in academic work at the University Park campus. Students should note that 601 cannot be used to meet the full-time residence requirement.
- A candidate for the Ph.D. must have satisfied the departmental communication and foreign language requirement (if applicable) before taking the comprehensive examination.
- Three or more months must have elapsed between the passing of the comprehensive examination and the scheduling of the final oral examination.
- The final oral examination must be held within six years of the date the comprehensive examination was passed. If more than six years have passed, a second comprehensive examination must be given before scheduling the final oral examination.
- **Continuous registration requirement.** Students must be registered continuously each semester (excluding summers) beginning with the semester following the passing of the comprehensive examination and continuing each semester until the final oral examination is passed.
- **Time limitation.** All requirements including submission of the thesis must be completed within eight years of the candidacy date.
- Students **MUST** be registered the semester of both the oral comprehensive examination and the final oral examination – even if taken during the summer session.
- No missing or deferred grades can appear on a student's transcript when the oral comprehensive examination or the final oral examination is scheduled.
- Students must have at least a 3.0 grade point average to schedule an oral comprehensive examination or final oral examination and to graduate.
- Doctoral candidates can be assigned letter grades for thesis research (600 on campus, 610 off campus) for a total number of 12 credits. Any credits over this maximum must be assigned as/changed to 'R' before a student will be permitted to graduate.
- Students cannot register for thesis preparation (601/611) until candidates have passed the comprehensive examination and have met the two-semester residence requirement.

THESE ARE GRADUATE SCHOOL REQUIREMENTS ONLY AND DO NOT INCLUDE SPECIFIC PROGRAM/DEPARTMENT REQUIREMENTS

How to Submit a Master's Thesis

- (1) Become familiar with the thesis format requirements by reading the Thesis/Dissertation Guide carefully (<http://www.gradschool.psu.edu/current-students/etd/>)
- (2) Activate the intent to graduate on eLion during the semester in which you plan to graduate. Go to <http://www.gradschool.psu.edu/current-students/etd/thesisdissertationperformance-calendar/> for deadlines.
- (3) Upload a draft of your thesis for format review to the eTD Web site (<http://www.gradschool.psu.edu/current-students/etd/about/>) by the specified deadline. Corrections and detailed instructions will be returned to you by e-mail within two weeks.
- (4) Make any changes required by thesis advisor and/or readers. Receive approval in the form of signatures on the Master's Signatory Page <http://www.gradschool.psu.edu/current-students/etd/mastersapprovalpagepdf/>.
- (5) Review the thesis one final time to be sure that no further changes are needed. It will not be possible to make corrections after final approval by the Graduate School. Convert the file into a pdf for eTD submission.
- (6) Go to the eTD Web site (<https://etda.libraries.psu.edu/>) and upload the final eTD; submit master's approval page to the Office of Theses and Dissertations and pay \$25 thesis fee (payable at <https://secure.gradsch.psu.edu/paymentportal/>).
- (7) Await verification of thesis approval by email. If further changes are required, you will be notified. Your eTD will be accessible on the eTD Web site immediately after graduation unless you have chosen restricted access.
- (8) If bound copies are needed, contact any Multimedia & Print Center on campus (<http://www.multimediaprint.psu.edu/>) or you may use an off-campus source. All copies are the author's responsibility. The Graduate School does not provide copies.

How to Submit a Doctoral Thesis

- (1) Become familiar with the thesis format requirements by reading the Thesis/Dissertation Guide carefully (<http://www.gradschool.psu.edu/current-students/etd/>).
- (2) Activate intent to graduate on eLion during the semester in which you plan to graduate. Go to <http://www.gradschool.psu.edu/current-students/etd/thesisdissertationperformance-calendar/> for deadlines.
- (3) Upload a draft of your dissertation for format review to the eTD Web site (<http://www.gradschool.psu.edu/current-students/etd/about/>) by the specified deadline. Corrections and detailed instructions will be returned to you by email within two weeks. (Note: the format review can be done either before or after the oral defense, as long as the deadline is met.)
- (4) Defend the dissertation and make any changes required by your committee. Receive approval from the committee in the form of signatures on the Doctoral Approval Page.
- (5) Review the dissertation one final time to be sure that no further changes are needed. It will not be possible to make corrections after final approval by the Graduate School. Convert the file into a pdf for eTD submission.
- (6) Go to the eTD Web site (<http://etda.libraries.psu.edu>) and upload the final eTD; submit the supporting materials to the Office of Theses and Dissertations (Note: It does not matter if you upload first or submit the materials first). Supporting materials are: signed Doctoral Signatory Page, ProQuest/UMI Agreement, Survey of Earned Doctorates, and \$95 fee (the fee can be paid at and all forms can be found at <https://secure.gradsch.psu.edu/paymentportal/>).
- (7) Await notification of eTD approval by email. If changes are required, you will be notified. Your eTD will be accessible on the eTD Web site immediately after graduation unless you have chosen restricted access.
- (8) If bound copies are needed, contact any Multimedia & Print Center (<http://www.multimediaprint.psu.edu/>) or you may use an off-campus source. All copies are the author's responsibility. The Graduate School does not provide copies.

This publication is available in alternative media on request.

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