

A Century of Graduate Education



INFORMATION FOR ENTOMOLOGY GRADUATE STUDENTS

**Washington State University
Department of Entomology**



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DEPARTMENTAL REQUIREMENTS FOR ADVANCED DEGREES

The requirements and procedures given here are in addition to and not in lieu of, those contained in the Graduate School Bulletin. Consult the Bulletin for the basic Graduate School requirements, which are not repeated here except in summary form at the end of this brochure.

ENTOMOLOGY DEPARTMENT PHILOSOPHY

The Department of Entomology at Washington State University, in addition to serving the goals of the College of Agriculture and Home Economics and the general university, specifies a Departmental philosophy. The Department demands excellence from every faculty member and strives to promote excellence in student endeavors. The primary function of the Department is service to the citizens of the State of Washington through teaching, research and extension. Specifically the Department senses an obligation to apply existing knowledge toward the solution of entomological problems and, when such knowledge is not available, to develop research programs that generate the needed information. The Department feels a responsibility to provide a course curriculum that prepares students in the broadest concepts of Entomology appropriate to the goals of the individual student. The Department further senses an obligation to maintain a balance between basic and applied science in its programs in order to meet immediate and future needs of society.

UNDERGRADUATE PREPARATION

While no specific undergraduate major is required, programs with a strong biological science background are preferred since otherwise excessive time may be involved in making up undergraduate deficiencies. Ordinarily a student should have no more than 4 course deficiencies. Table 1 lists specific departmental requirements at the undergraduate level. The Admissions Committee will review transcripts of admitted students and indicate to the student and to the student's Advisor any course deficiencies.

The departmental Graduate Admissions Committee, and the Department Chair, review all applications and recommend to the faculty whether a candidate should be admitted, offered financial support, or not recommended for graduate study.

Available assistantships will be offered prior to the beginning of each semester. In conformity with the Council of Graduate Schools Resolution, a student may submit a written resignation of an accepted appointment; however the student may not accept another offer without first obtaining a written release from the institution towards which a commitment had been made. An offer made after the semester begins is conditional on presentation by the student of a written release from any previously accepted offer.

ANNUAL REVIEW OF PROGRESS

In April of each year, each graduate student will prepare a summary of accomplishments. The student's advisor will review the summary and add comments endorsing it to the Chair. During May, Entomology faculty meet in closed session to discuss each student's academic and research progress. Each student also will be interviewed by the Chair. Following the review and interview each student will receive from the Chair a statement analyzing his/her progress with recommendations for any necessary improvement. As required by the Graduate School, the names of students not making satisfactory progress will be reported

to the Graduate School during May and appropriate action of termination or denying financial support will be taken.

SEMINARS AND SPECIAL PROBLEMS

Students are required to complete at least two seminars for the M.S. degree and five for the Ph.D. Two seminar credits are allowed for completion of a Master's program whether or not seminars were actually taken in that program. At least 1 seminar must be in Entomology, but students are encouraged to broaden their education by enrolling in seminars in other Departments. Entomology graduate students are expected to attend Entomology Seminars whether enrolled for credit or not.

A paper or display presentation given by a student at a professional meeting can be accepted for 1 hour of research or special problem credit in a student's graduate program up to a maximum of 2 credit hours.

COMMITTEE SELECTION

A student hired as a Research Assistant on a grant or a specific project will ordinarily have as a major advisor the faculty member in charge of that project. A self-supported student will have a temporary advisor appointed by the Chair until the student has selected a research problem. A student having an advisor from the research faculty outside of Pullman will have a member of his committee designated as an on-campus advisor who will handle necessary paperwork while the student is on campus.

During the first semester the student, in consultation with his advisor, selects a committee of not less than 3 faculty. It is recommended that one of them be a member of another Department. Selection of committee members should be done in consideration of the student's interests and experience. The student will work with this committee to select appropriate courses, to develop a research program, and to review and approve the M.S. thesis or Ph.D. dissertation. Changes in the Committee, necessitated by absence of a committee member or other reasons, may be made at any time by filing appropriate forms with the Graduate School.

PUBLIC PRESENTATION OF RESEARCH AND STUDY

For all graduate degrees, each student will be required to give a seminar describing his/her research and study activities as a partial fulfillment of the requirements for the degree. This non-graded seminar will be scheduled within fourteen (14) days prior to the scheduled final examination. The title, date, time and location of the seminar will be advertised at U of I, as well as other WSU departments. The student is responsible for scheduling the seminar and arranging for its announcement with the Academic Secretary.

MASTER OF SCIENCE DEGREE

The Master's degree may be a terminal degree or may be a preparatory phase of the Ph.D. program. Specific course requirements are listed in Table 2. Other courses may be selected by the student and committee to meet the student's interests up to or exceeding the 21 hours (26 hours for non-thesis) of graded course work required by the Graduate School.

Thesis Option: The student conducts original laboratory or field research and writes an acceptable thesis based on that research. The form, style, and content of the thesis must be approved by the committee and follow the Graduate School guidelines. These guidelines are found at this webpage: <http://www.wsu.edu/~gradsch/forms/DISSANDTHESES.pdf>. It should also conform with the CBE Style Manual (5th Ed), usually in the style of a recognized journal so that it may be submitted for publication with a minimum of revision. Publication of the thesis is strongly encouraged. Committee declares in writing journal or style selected.

The final examination is an oral examination but a partial written examination may be requested by the student or his advisor. The examination will cover the following areas at the advanced undergraduate level of competence: (1) general knowledge of biology and entomology; (2) insect taxonomy; (3) applied entomology; (4) ecology; (5) animal physiology. In addition, the candidate will be examined at the graduate level of knowledge in one area of specialization of his/her choice, for example, insect ecology, insect behavior, medical entomology, etc.

The examining committee consists of the thesis committee and at least one other member of the Graduate Faculty requested to serve as an examiner by the thesis Committee Chair. At least one member of the examining committee shall be from outside the Department of Entomology. If no outside member is on the thesis committee, this representative will be appointed by the Department Chair. To assure adequate coverage of the field and fairness of questioning, the examining committee will convene 15 minutes prior to the examination to discuss the appropriateness of the questions and the level of competence expected of the student. To facilitate this discussion examiners must have written copies of their questions available for each member. Questions may be asked by any participating graduate faculty member. There is a 1.5 hour time limit on the total duration of the examination. Each member of the examining committee will have 15 minutes to question the student. The rest of the time will be divided among those Graduate Faculty present desiring to question the student. The major professor and examining committee are encouraged to keep notes on questions and answers in the event of controversy. In the event of failure, the thesis committee and other participating Graduate Faculty members will decide by majority vote if the candidate will be allowed to retake the examination.

Teaching Requirement: Collegiate teaching experience is required of all M.S. candidates. A minimum of one semester of involvement is required. Methods of meeting the teaching requirement for a semester include, with the consent of the instructor: (1) the preparation, introductory remarks and conduct of at least 3 laboratory sessions for an entomology course; (2) presentation of 3 lectures; or (3) some other method approved by the student's advisor in consultation with the Entomology Chair. No monetary compensation will be paid except for students on a TA appointment. The instructor in charge will prepare an evaluation of the student's teaching performance either by letter or by completing a teaching evaluation form to be placed in the student's file.

Non-thesis Masters: This option is for the students not planning on a research career but who wish broad training for teaching, pest management consultation and similar positions. While candidates may continue toward a doctoral following this degree, it normally is considered to be a terminal degree.

More graded course work (26 hours) is required than for a thesis degree (21 hours). In addition, a student must prepare a scholarly review paper in journal style on a subject approved by the committee. As with the thesis, a copy of the paper will be filed with the Department the WSU Owen Science Library. The examination will follow the same format as for the thesis option.

DOCTOR OF PHILOSOPHY DEGREE

In pursuit of a Ph.D. degree in Entomology, the student should: (1) attain a knowledge of basic biological and scientific principles at a greater depth than for a MS; (2) be familiar with the history of entomology and biology and current problems in entomology; and (3) have a knowledge of entomological literature and methods. The dissertation should demonstrate an ability to plan, execute and synthesize original research in the solution of entomological problems.

The objective of Ph.D. dissertation research is to train students in all aspects of scientific endeavor including: (1) selecting a potential problem and designing experiments to test hypothesis; (2) performing field and/or laboratory experiments and observing biological and behavioral events; (3) preparing research proposals which would be acceptable to a major funding source (NSF, NIH, USDA, etc.); (4) analyzing

*Students will submit proposals for funding.

biological data using current techniques; (5) interpreting results with reasonable extrapolation and speculating on the significance of the research and future directions. The Ph.D. dissertation research should form a cohesive and significant piece of work, carried out in a professional and competent manner, that leads to the advancement of scientific knowledge.

Research Proposal: No later than the first semester following 2 semesters of study and one summer's research after entering the Ph.D. program. Each student will present a research proposal to the faculty and students as a formal seminar. Earlier presentation is desirable, particularly if the student plans to apply for a National Science Foundation or other financial support grant. During the semester the research proposal is due, the student will enroll for a minimum of 2 hours ENTOM 800 research credit for preparation and presentation of the proposal. The proposal should follow an NSF grant application format or other format approved by the student's committee. Faculty and students will be notified at least 1 week before the oral presentation. Copies of the proposal will be made available to the committee members, and 1 copy placed in the Entomology office for review by other faculty and students. One copy of the proposal will be sent to each Research Center for the information of faculty there.

The oral presentation will be made during regular seminar period, if a free period is available, or at a specially scheduled time. Following a presentation of not more than 40 minutes, the candidate will respond to questions and suggestions. Within a week after the oral presentation, the faculty will meet to discuss the proposal. If it is unsatisfactory, the proposal will be referred back to the student with specific suggestions for revision. For minor revisions, committee approval will be sufficient. For major revisions the student may be requested to present the revised version in written form and, if necessary, an oral presentation.

The proposal, oral presentation, and subsequent questioning, is considered to be a learning experience intended to determine whether the student has gained the ability to search and interpret literature, design experiments, communicate with other scientists, and is aware of current developments in entomology or whether further development of such skills is needed.

Teaching Requirement: Collegiate teaching experience is required of all Ph.D. candidates. A minimum of two semesters of involvement are required. Methods of meeting the teaching requirement for a semester include, with the consent of the instructor: (1) the preparation, introductory remarks, and conduct of at least 3 laboratory sessions for an entomology course; (2) presentation of 3 lectures; or (3) some other method approved by the student's advisor in consultation with the Entomology Chair. No monetary compensation will be paid except for students on a TA appointment. The instructor in charge will prepare an evaluation of the student's teaching performance either by letter or by completing a teaching evaluation form to be placed in the student's file.

Non-Master's Ph.D.: Any student wishing to earn the Ph.D. degree without first earning a Master's degree must take both a written and oral examination at the end of the second semester. The student declares intent to the Chair who arranges the examination. As a result of the examination the candidate will either be permitted to continue study at the doctorate level or be required to change to a Master's program.

Qualifying Examination: When a student has completed all or most course work and feels adequately prepared by additional study, the candidate may ask to take the Departmental Qualifying Examination. The candidate is responsible for general knowledge (basic information, principles and concepts) of insect physiology, behavior, ecology, systematics, taxonomy, morphology, and embryology, invertebrate zoology; general biology; history, principles, and philosophy of science; genetics; biometry; organic chemistry; and scientific literature including indexing sources. Familiarity with current and future trends in Entomology is expected.

In addition, the candidate shall have a knowledge at a high level of proficiency in three (3) areas of specialization including at least two (2) of the following: insect physiology, biochemistry, behavior,

ecology, systematics, morphology and toxicology, agricultural entomology, medical entomology and forest entomology. One of the areas may be in another field of specialization such as plant ecology, horticulture, biometry, etc.

The student schedules the written Qualifying Examination with the Chair who selected five (5) faculty as follows to prepare questions: 2 Graduate Faculty, other than the major advisor, to write general area questions and 1 faculty member for each specialty area. In so far as possible the Chair will select the general area examiners on a rotation system so that all Graduate Faculty, including those located away from the Pullman campus, will be utilized. The examining committee may include faculty from whom the student has had no course work. "Examination in a specialty area may be written by faculty from another department if deemed necessary by the Entomology Department Chair and the student's advisor." The Chair will review the questions for overlap. The examination will be taken without references under supervision of the student's advisor. No time limit is set for the examination process but ordinarily the examination should be completed within 10 days.

The answers written by the candidate will be available to all faculty for review for at least three days prior to a general faculty meeting to be held within one week (unless there are unavoidable scheduling conflicts) after the examination is completed for the purpose of evaluating the performance of the candidate. In addition to the examining committee, all attending faculty who have read the examination answers may vote. The vote will be taken to evaluate the answers for each unit individually. Two or more negative votes on any ballot will fail the candidate. All five (5) sections of the examination must be passed in order to pass the examination.

In the event of failure, the faculty may require re-examination on the entire examination or only on portions of it. Regardless of the outcome of the examination, the student is urged to discuss his/her performance with each member of the examining committee. If the student is permitted to write a second examination, or any portion thereof, the same examining committee will prepare another examination. If there is a re-examination, the student in consultation with his/her advisor will decide the time of re-examination. No more than one re-examination will be allowed. All five sections of the Qualifying Examination must be passed in order to pass the examination.

Preliminary Examination: The oral Preliminary Examination is conducted under Graduate School rules. A candidate may schedule the Preliminary Examination to take place within 10 days after completion of the Qualifying Examination. The examination must be scheduled during regular or summer sessions and should be scheduled to allow the greatest participation by the Entomology Faculty. In the event of failure of the Qualifying Examination the Preliminary Examination must be canceled.

A meeting of all faculty intending to question the candidate is held immediately before the examination to determine the nature of the questions and answers in the event of disputes. There is no time limit on the examination. In the event of failure the RIS Entomology Faculty will vote and determine by simple majority whether the candidate will be permitted to take another examination.

Dissertation & Final Doctoral Examination: The form, style, and content of the thesis must be approved by the committee and follow the Graduate School guidelines. These guidelines are found at this webpage: <http://www.wsu.edu/~gradsch/forms/DISSANDTHESES.pdf>. Publication of the thesis is strongly encouraged. The Committee declares in writing journal or style selected. The oral Final Doctoral Examination is conducted under Graduate School rules.

FOREIGN STUDENT LANGUAGE REQUIREMENT

A foreign student whose native language is other than English must pass the English proficiency examination with a score of 80-100% in group II. Failure to attain this score will necessitate special work in English.

APPLICATION OF RULES

Students are bound by the provisions of the Graduate School Catalog and written Departmental requirements that are in effect at the time the student files a program unless the student wishes to accept any new rules adopted after that time.

Table 1. Courses required at the undergraduate level. Students lacking such courses or their equivalents from other institutions must take them in addition to their graduate program. Exceptions to departmental requirements may be made by majority vote of resident graduate faculty.

<u>SUBJECT:</u>	<u>SUITABLE WSU COURSES</u>
General Entomology	ENTOM 343
General Genetics	MBioS301
Animal/Plant/Cell Physiology	BIOL(ZOOL) 352, BIOL(BOT) 318
Introductory Ecology	BIOL 372
Chemistry	CHEM 332
Organic Chemistry	CHEM 240
Physical Science (e.g., Geology, Soils, Meteorology)	GEOL 102, SoilS 413, ES/RP 471, PHYS 101 & PHYS 102
Plant Science	BIOL (BOT) 318, 320 or HORT 201 or 304

Table 2. Additional courses required for M.S./PhD Degree

<u>SUBJECT:</u>	<u>SUITABLE WSU COURSES</u>
Applied Entomology (3 credits)	ENTOM 361, 362, 340, 448, 450, 460, 572, 545, 546, 551 or IPM 201, 452/552, 462/562
Biometry	STAT 412 or 512
Insect Ecology	ENTOM 541
Insect Physiology	ENTOM 550
Insect Taxonomy	ENTOM 439/539, or 440/540
Biochemistry	MBioS 303, 414
	MBioS 303, 414
Additional courses may be required by student's Graduate Advisory Committee.	

SUMMARY OF PROCEDURES - M.S. Degree, Thesis Option

PROCEDURE	UNDER DIRECTION OF	DATE
Apply for admission	Dept . Chair, Graduate School	At least 6 months prior to expected matriculation
Registration	Advisor, Chair	On-line via RONET/METRO at http://www.ronet.wsu.edu/Main/Apps/HomePage.asp
Obtain an Advisor	Department Chair	Prior to or as soon as possible after arrival at Pullman
Select a Committee	Student, Advisor, Chair	During first semester
Submit Program of Study	Committee, Department Chair & Graduate School	As soon as possible, but no later than the end of semester preceding graduation
Program approval	Graduate School	Following submittal, approved form returned to student and committee
Residence Requirement	Graduate School	1 year
Research	Advisor and committee	As soon as research problem is selected. Begin literature review first semester.
Apply for degree	Graduate School	Mid-semester before final exam--see Grad School deadlines.
Thesis	Advisor and Committee Also see Thesis Manual	Must be approved by committee 10 working days before final exam.
Schedule Final Oral Examination	Graduate School	When thesis is approved. At least 10 working days before final examination.
Thesis to Department	Chair	10 working days before final examination.
Thesis to Grad. Rep.	Graduate Representative	5 working days before final examination 10 days before final.
Thesis Seminar	Student, Chair	At least 10 working days preceding final examination.
Final Oral Examination	Committee, Chair, Grad School	Note Graduate School deadlines.
Final acceptance of thesis	Graduate School	No later than 5 days after final oral. Failure to do so will mean retaking final oral.

Check MS Graduate School requirements:

Total Credit	30 hours minimum
Graded course work	21 hours minimum
400-500 level courses in major	11 minimum
500 level courses	9 minimum
Supporting courses	up to 10 hours
300 level courses	3 hours maximum
700 level courses	variable credit
Seminars	2 hours

12 to 16 hours per semester is the normal load for full time student, 10 hours minimum and 12 hours maximum for half time students on appointment.

Website for the most up-to-date information: <http://www.wsu.edu/~gradsch/forms/TabSumMasterThesis.pdf>

NON-THESIS M.S. DEGREE

Same as above except as follows:

Total Credit	30 hours minimum
Graded Course work	26 hours minimum
Entom 702	2-4 hours
400-500 level courses in major	16 minimum
500 level courses	12 minimum
Supporting courses	up to 10
300 level courses	3 maximum
Seminars	2

Website for the most up-to-date information:

<http://www.wsu.edu/~gradsch/forms/TabSumMasterNonThesis.pdf>

SUMMARY OF PROCEDURES - Ph.D. Degree

PROCEDURE	UNDER DIRECTION OF	DATE
Apply for admission	Dept. Chair, Graduate School	At least 6 months prior to expected matriculation
Registration	Advisor, Chair	On-line via RONET/METRO http://www.ronet.wsu.edu/Main/Apps/HomePage.asp
Obtain an Advisor		Department Chair As soon as possible after arrival at Pullman
Select a Committee		Student, Advisor, Chair During first semester
Submit Program of Study	Committee, Department Chair & Graduate School	With M.S. - by end of third semester
Program approval	Graduate School	Following submittal, approved form returned to student and committee
Research	Committee	Begin as soon as possible
Research Proposal	Committee, Faculty	By end of semester following 2 semesters & a summer
Teaching Requirement	Dept. Chair	Ordinarily before taking prelims
Residence Requirement	Graduate School	3 years (2 at WSU and at least 2 continuous semesters)
Qualifying Examination	Chair, Committee, Graduate School	When qualifying exam is passed. May be scheduled for 10 days after qualifying.
Apply for degree	Graduate School	Mid-semester before final exam--see Grad School deadlines.
Dissertation to Library	Department, Library	Deposit copy in Department. Abstract at Library 10 days before trial.
Schedule Final Oral Examination	Graduate School	When dissertation is approved, 10 working days before final. At least 4 months after prelims but within 2 years.
Dissertation Seminar	Student, Chair	At least 10 working days prior to final examination.

Final Oral Examination	Committee, Graduate Representative, Graduate School	Note Graduate School deadlines.
Final Acceptance of Dissertation	Graduate School	No more than 5 days after final oral. Failure to do so will mean retaking final exam.

Note Ph.D. Graduate School requirements:

Core Requirement	
400-500 level graded courses	34 hours minimum
500 level courses	17 minimum
Seminars	5
300 level courses	6 hours maximum
Research and Additional Studies	
Entom 800	variable
Additional studies (300 level courses, maximum of 12)	variable
Transfer credit beyond bachelor	variable
TOTAL CREDIT	72 hours minimum

Website for the most up-to-date information: <http://www.wsu.edu/~gradsch/forms/TabSumDoctoral.pdf>

If you have questions contact:

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