



**Department of Entomology
Graduate Student Handbook
2011-2012**

DEPARTMENT OF ENTOMOLOGY
University of California, Riverside

Entomology Graduate Student Handbook and Supplementary Information Pamphlet*

These guidelines are meant to assist the student toward the successful completion of the Entomology Graduate program in a timely fashion. **All forms needed in the program are called out in underlined, italic print.** All forms are available on the Entomology website, in the Links, Forms, and General Information section: http://www.entomology.ucr.edu/links_and_general_info/. In addition, forms can be obtained from your Graduate Advisor, or from the Student Affairs Officer, located in the Biological Sciences Graduate Student Affairs Center, 1140 Batchelor Hall.

Information on the Administrative Staff duties, contact information, and the organization of the business office can be found on the web at http://www.entomology.ucr.edu/administrative_staff .

*The requirements and procedures described in this pamphlet are in addition to, and not in lieu of, those contained in the *UCR Graduate Student Handbook* available from the Graduate Division or on-line at <http://graduate.ucr.edu/GSHndbk.pdf> . Students who are unwilling or unable to adhere to policies and schedules contained herein may be subject to dismissal.

Revised: Fall 2011

In accordance with applicable Federal laws and University policy, the University of California does not discriminate in any of its policies, procedures, or practices on the basis of race, color, national origin, religion, sex, sexual orientation, age, or handicap.

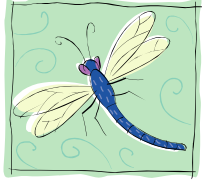
Inquiries regarding the University's equal opportunity policies may be directed to:

Gary Wilkins, Affirmative Action Office, (951) 827-5604.

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I. GENERAL

The Department of Entomology of the University of California, Riverside, offers programs leading to the M.S. and Ph.D. degrees with specialization in, but not restricted to, the areas below. Major and Minor Fields of Specialization include:

| | |
|--------------------------------------|-----------------------------------|
| Arthropod Vectors of Plant Pathogens | Integrated Pest Management |
| Biological Control | Medical and Veterinary Entomology |
| Biochemistry and Physiology | Molecular Entomology |
| Chemical Ecology | Nematology |
| Ecology and Evolution | Neuroscience |
| Insect-Plant Interactions | Pesticide Toxicology |
| Insect Behavior | Urban Entomology |
| Insect Pathology | |
| Insect Systematics | |

Information on participating individuals and their areas of research may be found on the Department of Entomology Web site (insects.ucr.edu). Suggested courses of study and information on other matters pertinent to all UCR graduate programs are found in the "UCR General Catalog", which may be purchased from the University Bookstore or viewed online at <http://www.catalog.ucr.edu/>, and in the "UCR Graduate Student Handbook," which may be obtained from the Graduate Division or online at <http://www.graduate.ucr.edu/>.



A. Instruction and Student Affairs Committee (ISAC)

The Instruction and Student Affairs Committee (ISAC) is responsible for establishing the rules and policies pertaining to the academic programs in the Department of Entomology. This committee also reviews applications, forms, and petitions submitted by students. ISAC consists of a chair, who is the Departmental Representative to the Graduate Division, the Graduate Advisor(s), the Undergraduate Advisor(s), other faculty from the Department, and a student representative selected by the Entomology Graduate Student Association (EGSA - see Section L). During the academic year, ISAC meets at least bi-weekly. Petitions and business that need ISAC attention should be given to Melissa Gomez in the Biological Sciences Graduate Student Affairs Center (1140 Batchelor Hall) for inclusion on the ISAC agenda.

B. Admission of Graduate Students

At this time, our University requires that all students apply on-line at

http://gradsis.ucr.edu/gradsis/GSIS_LOGIN.Login_student

When you fill out the application forms online, please carefully read and follow all instructions. There are Supplemental Application Forms that must be printed, signed, and mailed to us along with the application fee. The Graduate Division at UCR does not consider your application complete until we receive these documents. In addition, applicants must complete a departmental biography form and supply the following: (a) Official transcripts from all institutions of higher learning attended; (b) A minimum of three letters of recommendation from persons familiar with the applicant's academic training or research experience; and (c) Scores for the Graduate Record Examination (GRE) General test (taken within the last five years). Please submit all documents to the Entomology Graduate Program, UC Riverside, 900 University Avenue, Riverside CA 92521.

ALL applicants whose first language is not English and who have not earned an advanced degree at an institution where English is the exclusive language of instruction, must submit scores from the Test of English as a Foreign Language (TOEFL). This exam is administered by the Educational Testing Service and offered in nearly every country abroad. This exam must be taken within two years of the time you intend to enroll at UCR. The minimum acceptable scores are: 550 for the written exam; 213 for the computer-based exam, and 80 for the internet-based test (iBT). Any exceptions to this policy will be considered on an individual basis.

C. Minimum Requirements for Graduate Work in Entomology

Campus requirements for M.S. and Ph.D. degrees are given in the *UCR Graduate Student Handbook*. For admission to the graduate program, students must have a bachelor's degree with a major in either entomology, a biological science, chemistry, biochemistry, or a suitable equivalent. Regardless of undergraduate major, students must have had, or complete soon after entering graduate school, the following: 1. The equivalent of one year of course work each in general biology, general chemistry, and organic chemistry. 2. The equivalent of a one quarter course each in genetics and biochemistry. 3. The equivalent of 30 quarter units of life sciences other than entomology. Students who wish to specialize in insect biochemistry, insect physiology, molecular entomology, neuroscience, or toxicology may substitute additional courses in physical, organic, and biological chemistry; toxicology; and pharmacology for courses in life sciences. Credit from these courses does not count toward the unit requirement for the M.S. degree.

D. Required Courses

All graduate students are required to take the following courses: ENTM 201 (Structure and Function of Insects), ENTM 202 (Molecular Biology, Systematics, and Behavior), and ENTM 203 (Ecology, Population Genetics, and Pest Management). Normally, these courses will be taken during the first year at UCR. Students who can demonstrate that they have had equivalent, graduate-level courses elsewhere may petition ISAC to waive taking one or more of these courses. In addition, the student must satisfy their seminar requirements (see section E).

SUGGESTED FIRST-YEAR GRADUATE PROGRAM:

| Fall | Winter | Spring |
|--|--|---|
| ENTM 201 (5 units) Structure and Function of Insects | ENTM 202 (5 units) Molecular Biology, Systematics, and Behavior | ENTM 203 (5 units) Ecology, Population Genetics, and Pest Management |
| ENTM 100 ^a (4 units) General Entomology | ENTM 25X ^b (2 units) Letter Graded Seminar | ENTM 25X ^b (2 units) Letter Graded Seminar |
| ENTM 25X ^b (2 units) Letter Graded Seminar | ENTM 250 (1 unit) Seminar in Entomology | ENTM 250 (1 unit) Seminar in Entomology |
| BCH 100 ^a (5 units) Elementary Biochemistry | Electives | Electives |
| ENTM 250 (1 unit) Seminar in Entomology | | |
| Electives | | |

^a If needed as an entrance requirement or prerequisites for ENTM 201-203

^b One quarter of a letter-graded seminar is required each academic year.
See page 6 for a listing of the seminars offered each quarter.

E. Seminars

The Department has established four seminar requirements that must be met by all students.

1. Enrollment in the "Seminar in Entomology" (ENTM 250) on a Satisfactory/No Credit (S/NC) basis is required of each student during all three quarters of the academic year. This class features guest speakers each week, and exposes students to a myriad of entomological topics. For a satisfactory grade, students must attend at least 70% of the seminars offered during each quarter.
2. Students must take at least one Entomology 2-unit seminar course for a letter grade each academic year (an academic year consists of three successive quarters dating from the quarter of entry into the graduate program). Students are graded on their preparation and delivery of a formal seminar, and on their participation in the discussions of presentations. These courses are designed to give students an in-depth study of the subject matter, in addition to formal training in presenting scientific information. The table below lists a typical selection of the 2-unit seminars that might be offered in a given year. However, the selection of 2-unit seminars varies from year to year. Check the current course catalog for a listing of the 2-unit seminars that will be offered in a particular year.
- 3.

Department of Entomology Letter-graded Seminars

| Fall Quarter | Winter Quarter | Spring Quarter |
|--------------------------------|--------------------------------------|----------------------------------|
| ENTM253 Insect Toxicology | ENTM251 Insect-Plant Interactions | ENTM252 Insect Behavior |
| ENTM254 Biological Control | ENTM258 Insect Pest Management | ENTM256 Systematic Entomology |
| ENTM255 Med/Vet. Entomology | ENTM289 Neuroscience | ENTM289 Neuroscience |
| ENTM289 Neuroscience | | |

3. Continuing students will present a seminar (10-15 minutes) or a poster presentation of their research progress at the Annual Graduate Student Seminar Day, held just prior to the beginning of each fall quarter. This is an opportunity for students to share their work with the Department, and to learn about other student's projects.
4. Ph.D. and M.S. candidates must present a formal seminar on their dissertation or thesis research as part of their final defense. Advance announcement of this seminar will be made. If possible, this seminar should be scheduled as one of the regular ENTM 250 presentations.

F. Graduate Advisors and Quarterly Advising

When students arrive at UCR, they are assigned a Graduate Advisor. This Advisor remains with the student throughout their graduate program, providing advice on the student's academic program and course selection. Typically, near the middle of each quarter, students meet with their Graduate Advisor to discuss courses for the following quarter, and to obtain authorization for course registration. In anticipation of these advising sessions, the student should have a clear idea of which classes they wish to take, and they should discuss these selections with their Major Professor. The Graduate Advisors serve on ISAC, and because of this linkage they are able to transmit student issues to the faculty.



G. Student Petitions

Students may petition to have any departmental requirement waived or modified. The General Petition Form is available on the Entomology web site, from the Graduate Advisor, or from the Biological Sciences Graduate Student Affairs Center. Each petition must be signed by the student, the Major Professor, and the Graduate Advisor before returning it to the Student Affairs Officer in the Biological Sciences Graduate Student Affairs Center, who will forward it to ISAC for consideration.

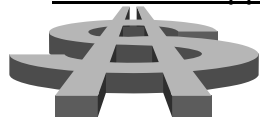
H. Foreign Language

Proficiency in a language other than English is not a blanket requirement for all M.S. or Ph.D. degrees. However, the Major Professor or Guidance Committee may require a student to attain foreign language proficiency if deemed necessary.

I. Change in Major Professor

Students can change their Major Professor if this change is in the best interest of either the student or the Major Professor. Prior to such a change, the student should consult with his/her Graduate Advisor. In addition, the Department Chair must be informed by the Major Professor and the student of any substantial change in their professional relationship. To formalize the change, the Change of Major Professor Form should be completed and forwarded to the Student Affairs Officer in the Biological Sciences Graduate Student Affairs Center.

J. Financial Support for Graduate Students



The typical graduate student in the Entomology Department at UCR is supported throughout their graduate studies. Funds come from a variety of sources, including Graduate Research Assistantships funded by their Major Professors' grant funds, Campus-wide Competitive Fellowships, Departmental Graduate Research Assistantships and Teaching Assistantships, external fellowships, educational grants from the students' home countries, and/or personal funds. Each student's financial

package is unique, and should be clearly understood by the student and their Major Professor prior to starting the program. Students who wish to be considered for the best funding packages should submit their application for graduate studies no later than **January 5** of the year prior to anticipated enrollment.

For non-California residents from other US states, funding for out-of-state tuition will be provided for one year, when possible. During the first year, these students should apply for, and receive, California residency, which significantly reduces tuition. Students from countries other than the US are not eligible for California residency and they must pay out-of-state tuition until they advance to candidacy. The student and their Major Professor need to identify funding sources to cover out-of-state tuition prior to admission. International Students are eligible for a 100% reduction in Non-Resident Tuition for nine quarters after they pass their Qualifying Exams and Advance to Candidacy for the Ph.D. degree.

K. Half-Time Graduate Student Status and Reduced Fee Status

A student requesting half-time graduate student status in the Department of Entomology must meet all of the following criteria:

- Requires half-time status because of occupational or family responsibilities, or health limitations. If applying for occupational reasons, the student must be employed full-time.
- Has the consent of the student's Major Professor and provides an academically feasible plan of study leading to the degree. This plan can include no more than six units per quarter during half-time status.
- If enrolled in the previous year as a half-time student, has made acceptable progress toward the degree (at least one half of the normal rate).
- Has not advanced to candidacy as a doctoral student.
- Does not hold a fellowship, Graduate Student Research Assistantship or Teaching Assistantship.
- Holds U.S. citizenship or permanent resident status (due to U.S. government visa restrictions).

Petitions for half-time status must be approved by ISAC. Half-time student status must be renewed at least yearly by petition to ISAC and the Graduate Division. (It also can be approved on a quarter-by-quarter basis.) Petitions are due at Graduate Division no later than the third week of the quarter. If the petition is received before fees are due, the difference between full time fees and reduced fees will be reduced from the bill.

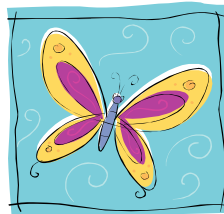
Half-time students are required to take Entomology 250 seminar every quarter. If circumstances require, students may petition ISAC for other arrangements. Half-time students are expected to advance to candidacy by the 20th quarter, after which they

would no longer be half-time, and would have 7 more quarters of normative time. The maximum time for the Ph.D. program for a half-time student thus is 9 years.

Employee Reduced Fee Status (RFS) is distinct from half-time status. Post-probation period career employees working at least half time, are eligible for RFS, for which they apply to Human Resources. The registration and educational fees are reduced by two-thirds. RFS students may take no more than 9 units or 3 courses per quarter (whichever is greater). They are expected to advance at normal rate and complete their programs within normative time. They may be employed by the University up to 100% time. They are not eligible for fellowships, Graduate Student Research Assistantships or Teaching Assistantships because they are not full-time students.

L. Entomology Graduate Student Association (EGSA)

A committee of departmental graduate students is elected annually by the students. One member of this committee is selected as a representative to ISAC with attendance and voting privileges when ISAC is considering the interpretation, modification, or additions to the graduate instructional program, as outlined in this supplemental guide. This individual also is available to ISAC and the Department Chair for consultation as needed.



SUPPLEMENTARY REQUIREMENTS AND PROCEDURES FOR THE DEGREE OF MASTER OF SCIENCE



A. Major Professor

Generally, students have identified their Major Professor upon admission to the M.S. program. However, for those who have not selected a Major Professor, they are encouraged to consult with Faculty members, Graduate Advisors, and other students to facilitate this selection. The Major Professor should be selected by the end of the **first quarter**. The Major Professor directs the student's research project and serves as Chair of the M.S. Guidance Committee.

B. M. S. Guidance Committee

Once the student has selected a Major Professor, a M.S. Guidance Committee is formed. This committee consists of the Major Professor and at least 2 other faculty members. Whereas it is common to choose these members from the Entomology Department faculty, faculty outside of the Department also may serve. Upon selection of the committee members, the student completes the M.S. Guidance Committee Form secures the initials of committee members and returns it to the Student Affairs Officer who will forward it to ISAC for approval. This form must be completed by the end of the **second quarter**.

The M.S. Guidance Committee will meet with the student at least annually, during the **spring quarter**. Following this meeting, the M.S. Guidance Committee provides a candid evaluation of the student's progress on the Report on Progress of Graduate Student Form. This form is sent to the Major Professor by the Student Affairs Officer early in the spring quarter. The progress reports serve as a permanent record of each student's progress, and a copy is forwarded to the Graduate Division.

C. Program of Academic Study

Each student, with the advice of their M.S. Guidance Committee, will select courses that will complement their research program. These courses must be submitted to the ISAC chair for approval on the MS Program of Academic Study Form, no later than the end of the **third quarter** at UCR. The Program of Academic Study will be binding upon approval by the ISAC chair, and the student is expected to take all of the courses listed as "required" prior to advancement to candidacy.

There is a minimum of 36 units required for all M.S. students. This consists of a minimum of 24 units of graduate coursework (200 level classes) which may include 12 units of Entomology Research (ENTM 297) and/or Entomology Thesis (ENTM 299), but no more than 3 units of ENTM 290 and 6 units of letter-graded seminars (see Section E, page 7). The remaining 12 units may be from graduate level or upper division undergraduate coursework (100 level classes). ENTM 250 departmental seminar, while required, does not count toward the 36 unit requirement.

D. Advancement to Candidacy

At the beginning of the last quarter of enrollment, a student must complete the front side of the *Application for Candidacy for the Master of Science in the Field of Entomology (Thesis Plan)* and have the Chair of the M.S. Committee sign the form. The student should then submit the form to the Student Affairs Officer who will complete the back, secure the Graduate Advisor's signature and submit the form to Graduate Division.

E. Final Oral Examination

A minimum of 30 days is required between submission of the thesis, including the Abstract, Introduction, data chapter(s) and Summary/Conclusions, to the M.S. Committee and the Final Oral Examination. This period should be sufficient for the Committee to read and provide comments on the thesis, and for the student to complete revisions and return the thesis for approval by the M.S. Committee prior to the Final Oral Examination.

The Final Oral Examination will deal primarily with the relation of the thesis to the general field in which the subject lies. This examination will be given by the M.S. Committee. The Major Professor, chair of the M.S. Committee, is responsible for scheduling the time and place of the examination. The student must inform the Student Affairs Officer of when and where the exam will be administered. The Student Affairs Officer prepares the Report on Final Defense for Master's Degree form and gives it to the Major Professor before the defense. A seminar open to the academic community will be required as part of the Final Oral Examination for all M.S. students (see page 7). Following the examination, the Major Professor is responsible for transmitting the result to the Student Affairs Officer, who then forwards the results of the examination to the Graduate Division.

F. Thesis

Four unbound copies of the thesis are required. Two copies should be handed in to the Graduate Division and two copies should be handed to the Student Affairs Officer, who will facilitate getting copies bound for the Department and the Major Professor. Students should contact the Graduate Division for details on thesis format requirements.

G. Normative Time

All requirements for the M.S. degree should be completed within two years (six academic quarters) following entry into the graduate program at UCR. Should a student require more than six quarters to complete the M.S. program, the Graduate Adviser will consult with the Major Professor to determine the need for a revised timetable of completion. A memo will then be sent to Graduate Division notifying them of the revised timetable.

H. M.S. Student Advancement to the Ph.D. Program

Students who are enrolled in the M.S. degree program and have nearly completed the requirements for this degree at UCR must petition ISAC if they wish to enroll in the Ph.D. program. Transfer to the Ph.D. program is not automatic. It usually is contingent upon completion of the M.S. requirements and requires clear evidence of promise in the Ph.D. program. The student completes a *Petition for Change in Major, Credential, Degree Program, or Add a Program* accompanied by the following: 1) a letter of evaluation from each member of the M.S. Committee, and 2) a letter from the prospective Ph.D. Major Professor expressing a willingness to serve in this capacity, addressing the question of financial support, and providing an estimated timeline for completion.

III. SUPPLEMENTARY REQUIREMENTS AND PROCEDURES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY



A. Major Professor

Generally, students have identified their Major Professor upon admission to the Ph.D. program. However, for those who have not selected a Major Professor, they are encouraged to consult with Faculty members, their Graduate Advisor, and other students to facilitate this selection. The Major Professor should be selected by the end of the **first quarter**.

The Major Professor will represent the Major Field of Specialization in Entomology (see list on page 3 for examples). In addition to directing the student's research project, the Major Professor serves as Chair of the Ph.D. Guidance Committee and the Ph.D. Dissertation Committee. The Major Professor does not serve on the Qualifying Committee.

B. Ph.D. Guidance Committee

Once the student has selected a Major Professor and decided on Major and Minor Fields of Specialization (see page 3 for a non-inclusive list of examples), a Ph.D. Guidance Committee is formed. This committee consists of the Major Professor, representing the Major Field of Specialization, a faculty member representing the Entomology Minor Field of Specialization, and a third Entomology Faculty member representing scientific breadth. In addition, each Ph.D. Guidance Committee will have one Faculty member from outside the Entomology Department representing an Outside Minor Field of Specialization. Upon selection of the fourth committee member, the student completes the Ph.D. Guidance Committee Form with the names of the committee members, and returns it to the Student Affairs Officer who will forward it to ISAC for approval. This form must be completed by the end of the **second quarter**.

The Ph.D. Guidance Committee will meet with the student at least annually, during the **spring quarter**. Following this meeting, the Ph.D. Guidance Committee provides a candid evaluation of the student's progress on the Report on Progress of Graduate Student Form. This form is sent to the Major Professor by the Student Affairs Officer early in the spring quarter. The progress reports serve as a permanent record of each student's progress, and a copy is forwarded to the Graduate Division.

C. Program of Academic Study

Each student, with the advice of their Ph.D. Guidance Committee, will select courses that complement their research program and help the student prepare for the qualifying examination. These courses must be submitted to the Student Affairs Officer who will forward it to ISAC for approval on the PhD Program of Academic Study Form, no later than the end of the **third quarter** at UCR. This program of academic study will be binding upon approval by ISAC, and the student is expected to take all of the courses

listed as “required” prior to the end of the seventh quarter, when the qualifying examination is given.

Students come to UCR with diverse interests, varying degrees of prior training, and numerous career objectives, thus there are no specific course requirements for the various fields of specialization. However, to assist students in designing their program of academic study, the Entomology Faculty have developed a list of suggested courses in Entomology that may be taken within various fields of specialization. There are also many appropriate courses in other Departments such as Biology, Botany and Plant Sciences, Environmental Toxicology, etc. The Entomology courses are:

Arthropod Vectors of Plant Pathogens: ENTM124 (Agricultural Entomology), ENTM 207 (Arthropod Vectors in Relation to Plant Diseases), ENTM209 (Microtechniques in Insect Morphology), ENTM 232 (Molecular Biology of Insects), ENTM 241 (Insect-Plant Interactions), ENTM 251 (Seminar in Insect-Plant Interactions), ENTM 258 (Seminar in Insect Pest Management).

Biological Control: ENTM 109 (Field Entomology), ENTM124 (Agricultural Entomology), ENTM 129 (Introduction to Biological Control), ENTM 129L (Introduction to Biological Control Laboratory), ENTM 208 (Host-Parasite Relationships), ENTM 209 (Microtechniques in Insect Morphology), ENTM 227 (Insect Population Ecology), ENTM 229 (Advanced Biological Control), ENTM 231 (Insect Pathology), ENTM 254 (Seminar in Biological Control)

Biochemistry and Physiology: ENTM 208 (Host-Parasite Relationships), ENTM 232 (Molecular Biology of Insects), ENTM 243 (Advanced Insect Physiology, Biochemistry, and Molecular Biology), ENTM 240 (Research Methods in Insect Chemical Ecology), CMDB 257 (Graduate Seminar in Cell, Molecular, and Developmental Biology), ENTM 277 (Research Seminar in Insect Biochemistry and Toxicology), ENTM 287 (Colloquium in Neuroscience), ENTM 289 (Special Topics in Neuroscience).

Chemical Ecology: ENTM 162 (Insect Behavior), ENTM 232 (Molecular Entomology), ENTM 240 (Methods in Chemical Ecology), ENTM 241 (Insect-plant Interactions), ENTM 252 (Seminar in Insect Behavior), ENTM 272 (Research Seminar in Insect Communication and Behavior), ENTM 251 (Seminar in Insect-Plant Interactions)

Ecology and Evolution: ENTM 109 (Field Entomology), ENTM 114 (Aquatic Entomology), ENTM 162 (Insect Behavior), ENTM 212 (Ecological Systems in Space and Time), ENTM 227 (Insect Population Ecology), ENTM 232 (Molecular Entomology), ENTM 241 (Insect-Plant Interactions), ENTM 251 (Seminar in Insect-Plant Interactions), ENTM 254 (Seminar in Biological Control)

Insect-Plant Interactions: ENTM 162 (Insect Behavior), ENTM 212 (Ecological Systems in Space and Time), ENTM 227 (Insect Population Ecology), ENTM 232 (Molecular Entomology), ENTM 240 (Research Methods in Insect Chemical Ecology), ENTM 241 (Insect-Plant Interactions), ENTM 251 (Seminar in Insect-Plant Interactions), ENTM 252 (Seminar in Insect Behavior)

Insect Behavior: ENTM 162 (Insect Behavior), ENTM 227 (Insect Population Ecology), ENTM 232 (Molecular Biology of Insects), ENTM 240 (Research Methods in Insect Chemical Ecology), ENTM 241 (Insect-Plant Interactions), ENTM 252 (Seminar in Insect Behavior), ENTM 272 (Research Seminar in Insect Communication and Behavior)

Insect Pathology: ENTM 129 (Introduction to Biological Control), ENTM 129L (Introduction to Biological Control Laboratory), ENTM 208 (Biochemical and Molecular Host-Parasite Relationships), ENTM 229 (Advanced Biological Control), ENTM 231 (Insect Pathology), ENTM 232 (Molecular Entomology), ENTM 243 (Advanced Insect Physiology, Biochemistry, and Molecular Biology), ENTM 254 (Seminar in Biological Control), ENTM 257 (Graduate Seminar in Cell, Molecular, and Developmental Biology)

Insect Systematics: ENTM 109 (Field Entomology), ENTM 129 (Introduction to Biological Control), ENTM 129L (Introduction to Biological Control Laboratory), ENTM 212 (Ecological Systems in Space and Time), ENTM 256 (Seminar in Systematic Entomology), ENTM 219 (Theory of Systematics)

Integrated Pest Management: ENTM 124 (Agricultural Entomology), ENTM 126 (Medical and Veterinary Entomology), ENTM 126L (Laboratory in Medical and Veterinary Entomology), ENTM 128 (Chemistry and Toxicology of Insecticides), ENTM 129 (Introduction to Biological Control), ENTM 129L (Introduction to Biological Control Laboratory), ENTM 133 (Urban Entomology), ENTM 162 (Insect Behavior), ENTM207 (Arthropod Vectors in Relation to Plant Disease), ENTM 229 (Advanced Biological Control), ENTM 231 (Insect Pathology), ENTM 232 (Molecular Entomology), ENTM 241 (Insect-Plant Interactions), ENTM 251 (Seminar in Insect-Plant Interactions), ENTM 254 (Seminar in Biological Control), ENTM 255 (Seminar in Medical and Veterinary Entomology), ENTM 258 (Seminar in Insect Pest Management).

Medical and Veterinary Entomology: ENTM124 (Agricultural Entomology), ENTM 126 (Medical and Veterinary Entomology), ENTM 126L (Laboratory in Medical and Veterinary Entomology), ENTM 133 (Urban Entomology), ENTM 208 (Biochemical and Molecular Host-Parasite Relationships), ENTM 255 (Seminar in Medical and Veterinary Entomology), ENTM 276 (Research Seminar in Medical, Urban, and Veterinary Entomology)

Molecular Entomology: ENTM 208 (Biochemical and Molecular Host-Parasite Relationships), ENTM 226 (Insect Development), ENTM 232 (Molecular Biology of Insects), ENTM 243 (Advanced Insect Physiology, Biochemistry, and Molecular Biology), ENTM 257 (Graduate Seminar in Cell, Molecular and Developmental Biology), ENTM 281 (Research Seminar in Molecular Entomology)

Nematology: Consult the Department of Nematology for course suggestions

Neuroscience: ENTM 162 (Insect Behavior), ENTM 232 (Molecular Entomology), ENTM 243 (Advanced Insect Physiology, Biochemistry, and Molecular Biology), ENTM 287 (Colloquium in Neuroscience), ENTM 289 (Special Topics in Neuroscience), for additional suggestions, consult the Neuroscience Graduate Program.

Pesticide Toxicology: ENTM 128 (Chemistry and Toxicology of Insecticides), ENTM 253 (Seminar in Insect Toxicology), ENTM 257 (Graduate Seminar in Cell, Molecular and Developmental Biology), ENTM 277 (Research Seminar in Insect Biochemistry and Toxicology)

Urban Entomology: ENTM 126 (Medical and Veterinary Entomology), ENTM 126L (Laboratory in Medical and Veterinary Entomology), ENTM 133 (Urban Entomology), ENTM 255 (Seminar in Medical and Veterinary Entomology), ENTM 276 (Research Seminar in Medical, Urban, and Veterinary Entomology)

D. Dissertation Proposal

Each student will submit a formal written dissertation proposal to the Ph.D. Guidance Committee by the end of the **fourth quarter**. This proposal will be critiqued by the Ph.D. Guidance Committee, who will make suggestions for improvement. This revised proposal becomes the foundation of the student's Ph.D. dissertation research. A copy of the proposal will be submitted to each member of the Qualifying Committee (see below), who may decide to use it as a basis for questioning in the Qualifying Examination.

E. Qualifying Committee

By the end of the **sixth quarter**, the student, in consultation with the Ph.D. Guidance Committee, will select three faculty members to serve on the Qualifying Committee (Part I). The Major Professor may not serve on the Qualifying Committee. The three members will consist of the Chair and two other members who represent the Entomology major and minor fields of specialization, and the outside minor field of specialization. Typically, these three faculty members have also served on the Ph.D. Guidance Committee, but this is not required. These three names are submitted to ISAC on the *PhD Qualifying Exam Committee Form*. ISAC, upon approval of the three, will suggest three additional names for service on the Qualifying Committee on the blue ISAC Qualifying Exam Committee Form. The student chooses two from this list of three, completing the 5 member Qualifying Committee. ISAC will submit the committee members to the Graduate Division, who confers final appointment. The Chair is responsible for all aspects of administering the Qualifying Examination.

F. Qualifying Examination

The student is expected to complete all courses in the Program of Academic Study (see page 13) prior to taking the Qualifying Examination. This examination is administered by the Qualifying Committee by the end of the **seventh quarter**. Failure to take the qualifying examination by the end of the seventh quarter will be viewed as a departure from normal progress, and must be justified by the student and his or her Major Professor.

The qualifying examination consists of a written portion and an oral portion. The Chair of the Qualifying Committee is responsible for scheduling the time and place of both portions of the examination. The student must inform the Student Affairs Officer of when and where the examination will be administered. The Student Affairs Officer prepares the Report on Qualifying Examination for the Degree of Doctor of Philosophy form and gives it to the Chair before the oral examination. The Student Affairs Officer also prepares the Report of Departmental Requirements for the Ph.D. degree in Entomology, secures the Graduate Advisor's signature and submits it to Graduate Division before the oral examination. Each member of the Qualifying Committee submits questions for the written examination to the Chair, who determines the order in which questions are given to the student. Assuming the student passes the written portion of the exam, an oral qualifying examination is scheduled to follow shortly thereafter.

The Committee may meet once prior to the written examination to discuss the student's progress, the dissertation proposal, or other issues related to the student's program, and to coordinate the examination procedure. The Major Professor, though not a member of the Qualifying Committee, may submit questions to the Qualifying Committee for consideration of inclusion in the written examination. The Major Professor may attend the oral examination and provide information as needed or requested, but may not attend or take part in the deliberations following the examination. After the vote is taken and recorded, the Qualifying Committee Chair will verbally summarize the Committee's assessment of the student's performance on the qualifying examination for the student and Major Professor. The Chair of the Qualifying Committee also is responsible for transmitting the result of the examination to the Student Affairs Officer, who then forwards this information to the Graduate Division. Possible grades are pass, fail with the option to retake the exam, or fail.

Students who fail the qualifying examination and who are eligible, must retake it within six months, but not sooner than three months, with the approval of the Graduate Division. If the exam is failed a second time, the student will be subject to dismissal from the Ph.D. program. Passing the qualifying examination along with fulfillment of all course requirements normally qualifies the student for Advancement to Candidacy.

G. The Dissertation Committee and Final Oral Examination

Within one quarter of successful completion of the Qualifying Examination, the student selects a Dissertation Committee. This committee consists of the Major Professor and at least two other faculty members, and is submitted to ISAC on the *PhD Dissertation Committee Form*. Because the Ph.D. Guidance Committee has become familiar with the student's research, the members of the Ph.D. Guidance Committee often are selected to serve on the Dissertation Committee, but this is not required. The Dissertation Committee is responsible for guidance, editing, and approval of the dissertation. This Committee also administers the Final Oral Examination.

A minimum of 30 days is required between submission of the written dissertation, including the Abstract, Introduction, data chapters and Summary/Conclusions, to the Dissertation Committee, and the Final Oral Examination. This period should be sufficient for the Committee to read and provide comments on the dissertation, and for the student to complete revisions and return the dissertation for approval by the Dissertation Committee prior to the Final Oral Examination.

A seminar, open to the academic community, will be required as part of the Final Oral Examination (see page 6). The student is responsible for notifying the Student Affairs Officer of when and where the Final Oral Exam will take place. The Student Affairs Officer prepares the Report on Final Examination for the Degree of Doctor of Philosophy form and gives it to the Major Professor before the defense. Upon completion of the exam, the Major Professor and Dissertation Committee complete this form and give it to the Student Affairs Officer, who then forwards the results of the examination to the Graduate Division.

H. Ph. D. Dissertation

Four unbound copies of the dissertation are required. Two copies should be handed in to the Graduate Division and two copies should be handed to the Student Affairs Officer, who will facilitate getting copies bound for the Department and the Major Professor. Students should contact the Graduate Division for details on format requirements.

I. Normative Time

Students entering the Ph.D. program with either a B.S. or M.S. in Entomology or a related field should complete all requirements for the Ph.D. degree within 17 quarters. Should a student require more than 17 quarters to complete the Ph.D. program, the Graduate Adviser will consult with the Major Professor to determine the need for a revised timetable of completion. A memo then will be sent to Graduate Division notifying the Division of the revised timetable.

