ENTOMOLOGY, M.S.

The department is a diverse unit of researchers whose work spans the areas of suborganismal, organismal, and applied entomology. Research programs of the faculty are broadly interdisciplinary employing cutting edge technology in all areas. Individual faculty web pages provide in-depth descriptions of the diversity of research in entomology.

Suborganismal research in the department focuses on insect physiology and population genetics. Areas of specialization include the molecular action of insect hormones and the insect/microbiome interface. Studies of gene flow utilize various molecular methods. Genomic data are used to understand adaptation, gene flow on landscapes, the genetic basis of phenotypes, and the phylogenetic relationships of insect species.

Organismal: Entomology faculty members are leaders in the areas of basic ecology of insects in a variety of natural and managed systems, such as forests, lakes and agroecosystems. Studies in taxonomy, chemical ecology, spatial analysis, vector biology, behavioral ecology, and landscape ecology have strong representation in the department. Research examines how they affect crops and forests, influence ecosystem processes such as nutrient and carbon cycling and the "services" they provide in natural and managed ecosystems such as pollination and pest suppression.

Applied/Extension: Faculty in the department extend a long tradition of research on insects as they impact humans. Excellence in agricultural research continues in vegetable crops, field and forage crops and the turf and ornamental "green industry" where work has continued to advance the application of integrated pest management in agricultural systems. Basic research conducted by faculty in cropping systems also has implications for pest management, conservation, bioenergy, resource management. This research extends to global health issues focusing on arthropod borne diseases and insects as a novel food source.

Research in the department explores the interconnections across scales of biological organization, from molecular and cellular interactions to ecosystem-level studies, in both managed and natural systems, and from basic to applied research. Faculty members collaborate with colleagues in other departments in the College of Agricultural and Life Sciences, and beyond the college and university.

Graduate education in the Department of Entomology provides many opportunities for collaborative research. Faculty members participate in joint instructional programs with other departments on campus and with scientists at other universities, in federal and state agencies, and in industry. Because several entomology faculty members are also adjunct professors in zoology, forest and wildlife ecology, molecular and environmental toxicology, and other departments, they may serve as primary advisers to graduate students majoring in those fields. Opportunities exist to conduct research in a variety of distant tropical and temperate regions, to gain experience in classroom instruction and individual mentoring, and to participate in outreach activities such as addressing K–12 classes, naturalist groups, and commodity producers.

FUNDING

GRADUATE SCHOOL RESOURCES

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (https://grad.wisc.edu/funding) is available from the Graduate School. Be sure to check with your program for individual policies and processes related to funding.

PROGRAM RESOURCES

Additional information regarding funding for Entomology graduate students is available on the departmental website (http://labs.russell.wisc.edu/ento/graduate-study/funding-information).

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/#policiesandrequirementstext), in addition to the program requirements listed below.

ADMISSIONS

Please consult the table below for key information about this degree program's admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program’s website.
MAJOR REQUIREMENTS

MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Mode of Instruction Definitions

Evening/Weekend: These programs are offered in an evening and/or weekend format to accommodate working schedules. Enjoy the advantages of on-campus courses and personal connections, while keeping your day job. For more information about the meeting schedule of a specific program, contact the program.

Online: These programs are offered primarily online. Many available online programs can be completed almost entirely online with all online programs offering at least 50 percent or more of the program work online. Some online programs have an on-campus component that is often designed to accommodate working schedules. Take advantage of the convenience of online learning while participating in a rich, interactive learning environment. For more information about the online nature of a specific program, contact the program.

Hybrid: These programs have innovative curricula that combine on-campus and online formats. Most hybrid programs are completed on-campus with a partial or completely online semester. For more information about the hybrid schedule of a specific program, contact the program.

Accelerated: These on-campus programs are offered in an accelerated format that allows you to complete your program in a condensed time-frame. Enjoy the advantages of on-campus courses with minimal disruption to your career. For more information about the accelerated nature of a specific program, contact the program.

CURRICULAR REQUIREMENTS

Requirements Detail

<table>
<thead>
<tr>
<th>Minimum Credit Requirement</th>
<th>30 credits</th>
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</thead>
<tbody>
<tr>
<td>Minimum Residence Credit Requirement</td>
<td>16 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework Requirement</td>
<td>Half of degree coursework (15 credits out of 30 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (<a href="https://registrar.wisc.edu/course-guide/">https://registrar.wisc.edu/course-guide/</a>).</td>
</tr>
<tr>
<td>Overall Graduate GPA Requirement</td>
<td>3.00 GPA required</td>
</tr>
</tbody>
</table>

Other Grade Requirements

The Graduate School requires an average grade of B or better in all course work (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.

Assessments and Examinations

Students are required to hold a coursework certification meeting, submit certification paperwork, and hold a final defense exam. Additional information regarding required assessments and examinations is listed in the program handbook (http://labs.russell.wisc.edu/ento/graduate-study/handbooks-and-forms/).

Language

Contact the program for information on any language Requirements requirements.

REQUIRED COURSES

Additional information and forms related to program-specific courses is available in the program handbook (http://labs.russell.wisc.edu/ento/graduate-study/handbooks-and-forms).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTOM/ZOOLOGY 302</td>
<td>Introduction to Entomology</td>
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</table>

Must take at least 3 credits from 2 of the categories below:

Organismal

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTOM 331</td>
<td>Taxonomy of Mature Insects</td>
<td></td>
</tr>
<tr>
<td>ENTOM 432</td>
<td>Taxonomy and Bionomics of Immature Insects</td>
<td></td>
</tr>
<tr>
<td>ENTOM 450</td>
<td>Basic and Applied Insect Ecology</td>
<td>1</td>
</tr>
<tr>
<td>ENTOM 451</td>
<td>Basic and Applied Insect Ecology Laboratory</td>
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</tr>
<tr>
<td>ENTOM/BOTANY/ZOOLOGY 473</td>
<td>Plant-Insect Interactions</td>
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Ecotoxicology: The Chemical Players

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTOM/AGRONOMY/F&amp;W ECOL/M&amp;ENVTOX 632</td>
<td>Ecotoxicology: The Chemical Players</td>
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</tr>
<tr>
<td>ENTOM/AGRONOMY/F&amp;W ECOL/M&amp;ENVTOX 633</td>
<td>Ecotoxicology: Impacts on Individuals</td>
<td></td>
</tr>
<tr>
<td>ENTOM/AGRONOMY/F&amp;W ECOL/M&amp;ENVTOX 634</td>
<td>Ecotoxicology: Impacts on Populations, Communities and Ecosystems</td>
<td></td>
</tr>
<tr>
<td>ENTOM 701</td>
<td>Advanced Taxonomy</td>
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</tbody>
</table>

Ecotoxicology: Impacts on Populations, Communities and Ecosystems

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENTOM 321</td>
<td>Physiology of Insects</td>
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<tr>
<td>ENTOM/BOTANY/PL PATH 505</td>
<td>Plant-Microbe Interactions: Molecular and Ecological Aspects</td>
<td></td>
</tr>
<tr>
<td>ENTOM/GENETICS/ZOOLOGY 624</td>
<td>Molecular Ecology</td>
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</table>

Molecular Ecology

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTOM/M M &amp; I/PATH-BIO/ZOOLOGY 350</td>
<td>Parasitology</td>
<td></td>
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<tr>
<td>ENTOM 351</td>
<td>Principles of Economic Entomology</td>
<td></td>
</tr>
<tr>
<td>ENTOM/ZOOLOGY 371</td>
<td>Biology of Disease Vectors</td>
<td></td>
</tr>
<tr>
<td>ENTOM 450</td>
<td>Basic and Applied Insect Ecology Laboratory</td>
<td></td>
</tr>
<tr>
<td>ENTOM 451</td>
<td>Basic and Applied Insect Ecology Laboratory</td>
<td></td>
</tr>
<tr>
<td>ENTOM/F&amp;W ECOL 500</td>
<td>Insects in Forest Ecosystem Function and Management</td>
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</tbody>
</table>

Seminars

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENTOM 601</td>
<td>Seminar in Methods of Scientific Oral Presentations</td>
<td>1</td>
</tr>
</tbody>
</table>
ENTOM 801  Colloquium  1
ENTOM 901  Seminar in Organismal Entomology  1
or ENTOM 875  Special Topics

Additional Credits
Students must take additional credits, in consultation with their advisor, to reach a total of 30 credits. This may include ENTOM 990.

POLICIES

GRADUATE SCHOOL POLICIES
The Graduate School’s Academic Policies and Procedures (https://grad.wisc.edu/acadpolicy) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

MAJOR-SPECIFIC POLICIES

GRADUATE PROGRAM HANDBOOK
The Graduate Program Handbook (http://labs.russell.wisc.edu/ento/graduate-study/handbooks-and-forms) is the repository for all of the program’s policies and requirements.

PRIOR COURSEWORK

Graduate Work from Other Institutions
With Advisory Committee and Academic Affairs Committee approval, students are allowed to count no more than 14 credits of graduate course work from other institutions. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

UW–Madison Undergraduate
With Advisory Committee and Academic Affairs Committee approval, the student may apply up to 7 credits numbered 300 or above completed at UW–Madison toward fulfillment of minimum degree requirements. This work would not be allowed to count toward the Minimum Graduate Coursework (50%) Requirement unless taken at the 700 level or above. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

UW–Madison University Special
With Advisory Committee and Academic Affairs Committee approval, the student may apply up to 15 University Special student credits as fulfillment of the minimum graduate residence or graduate degree credit requirements on occasion as an exception (on a case-by-case basis). UW–Madison coursework taken as a University Special student would not be allowed to count toward the Minimum Graduate Coursework (50%) Requirement unless taken at the 700 level or above. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

PROBATION
The Graduate School regularly reviews the record of any student who earned grades of BC, C, D, F, or Incomplete in a graduate course (300 or above), or grade of U in research credits. This review could result in academic probation with a hold on future enrollment or in being suspended from the Graduate School.

ADVISOR / COMMITTEE
Every graduate student is required to have an advisor. To ensure they are making satisfactory progress toward a degree, the Graduate School expects that students meet with their advisor on a regular basis.

An advisor generally serves as the thesis advisor. In many cases, an advisor is assigned to incoming students. Students can be suspended from the Graduate School if they do not have an advisor.

An advisor is a faculty member, or sometimes a committee, from the major department responsible for providing advice regarding graduate studies.

A committee often accomplishes advising for the students in the early stages of their studies.

CREDITS PER TERM ALLOWED
15 credits

TIME CONSTRAINTS
Master’s degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

OTHER
All Entomology applicants (M.S. and Ph.D.) must contact faculty members in the department before and during the admissions process. All students are admitted directly into a faculty member’s lab. Additionally, we do not accept new graduate students into the program unless financial support for the student is currently in the hands of a faculty member, or is assured by the time a student begins, or a student brings independent funding and has contacted a faculty member who agrees to advise.

PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES
Take advantage of the Graduate School’s professional development resources (https://grad.wisc.edu/pd) to build skills, thrive academically, and launch your career.

PROGRAM RESOURCES
Students in the Department of Entomology are strongly encouraged to participate in student organization activities (http://labs.russell.wisc.edu/ento/graduate-study/student-organizations).

LEARNING OUTCOMES
1. Develop a broad knowledge base of entomology, inclusive of suborganismal, organismal, and applied entomology.
2. Knowledge of laboratory and/or field methodology.
3. Recognize relationships between structure and function at appropriate levels: molecular, cellular, organismal or ecological.
4. Explain and apply scientific methods including designing and conducting experiments and testing hypotheses.

PEOPLE

PROFESSORS
Brunet, Johanne
Goodman, Walter
Gratton, Claudio
Groves, Russell
Lindroth, Richard
Paskewitz, Susan (chair)
Raffa, Kenneth
Williamson, R. Chris
Young, Daniel
Zhu, Jun

ASSISTANT PROFESSORS
Guedot, Christelle
Schoville, Sean
Steffan, Shawn

ADJUNCT & AFFILIATED FACULTY
Bartholomay, Lyric (Pathobiological Sciences)
Currie, Cameron (Bacteriology)
Ives, Anthony (Integrated Biology)
Mattson, William (adjunct)
Peckarsky, Bobbi (adjunct)

INSTRUCTIONAL STAFF
Brabant, Craig, Curator Wisconsin Insect Research Collection
Liesch, Patrick (P.J), Assistant Faculty Associate Insect Diagnostic Lab