MOLECULAR AND ENVIRONMENTAL TOXICOLOGY, PH.D.

Molecular and environmental toxicology is a multidisciplinary subject that involves the study of mechanisms of action of environmental toxicants on humans and other organisms and the behavior of these toxicants in the environment. The UW-Madison Molecular and Environmental Toxicology Center’s graduate program provides students with expert knowledge in at least one specialty plus a broad understanding of other specialties that contribute to the resolution of environmental toxicology problems. The center is sponsored by the School of Medicine and Public Health as well as the College of Agricultural and Life Sciences, the School of Veterinary Medicine and the School of Pharmacy. The center links researchers in numerous academic departments who are working on problems in this area.

An interdisciplinary graduate program leading to the doctor of philosophy or a master of science in molecular and environmental toxicology is offered by the center under the direction of an executive committee composed of faculty affiliated with the center. The program offers two general approaches: mechanisms of pathobiology of chemically induced disease and environmental activities of chemicals. Each approach is subdivided into focal areas including metabolic and genetic toxicology, neurotoxicology, and immunotoxicology; and ecotoxicology, bioremediation, and distribution and assessment of environmental chemicals. All students participate in a core curriculum that addresses these various areas and that is supplemented by other advanced, specialized courses. Students perform research under the guidance of one of the center’s graduate faculty members.

Recipients of graduate degrees in molecular and environmental toxicology pursue careers in governmental agencies (policymaking, regulations, standard setting, or research), private industry (e.g., hazardous waste management, occupational safety, consumer affairs, research and development, or regulatory compliance), and the academic community (teaching and research). The center office maintains specific information concerning career placements.

ADMISSIONS

GRADUATE SCHOOL ADMISSIONS

Graduate admissions is a two-step process between academic degree programs and the Graduate School. Applicants must meet requirements of both the program(s) and the Graduate School. Once you have researched the graduate program(s) you are interested in, apply online (https://grad.wisc.edu/admissions).

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Deadline</td>
<td>December 1</td>
</tr>
<tr>
<td>Spring Deadline</td>
<td>The program does not admit in the spring.</td>
</tr>
<tr>
<td>Summer Deadline</td>
<td>The program does not admit in the summer.</td>
</tr>
<tr>
<td>GRE (Graduate Record Examinations)</td>
<td>Not required but may be considered if available.</td>
</tr>
</tbody>
</table>

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<tr>
<th>English Proficiency Test</th>
<th>English or whose undergraduate instruction was not in English must provide an English proficiency test score and meet the Graduate School minimum requirements (<a href="https://grad.wisc.edu/apply/requirements/#english-proficiency">https://grad.wisc.edu/apply/requirements/#english-proficiency</a>).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Test(s) (e.g., GMAT, MCAT)</td>
<td>n/a</td>
</tr>
<tr>
<td>Letters of Recommendation Required</td>
<td>3</td>
</tr>
</tbody>
</table>

The Molecular & Environmental Toxicology Program's admission deadline is December 1 for consideration matriculation in fall the following year (i.e., December 1, 2017 deadline for a fall 2018 matriculation).

To qualify for graduate study in Molecular and Environmental Toxicology, applicants normally have a bachelor’s degree in a biological or physical science, with at least a 3.0 GPA (on a 4.0 scale). The following courses should be completed before entrance to the program: four semesters of chemistry, including at least one of organic (depending on the planned direction within the program, a semester of either analytical chemistry or biochemistry is highly recommended); one semester of math-based physics (a second semester is highly recommended); and three semesters of biology, including coverage of introductory genetics. One or more semesters of calculus is highly recommended. If applicants have not taken one semester of statistics, biometrics, or an equivalent course, and one semester of biochemistry equivalent to the UW-Madison Biochem 501 course, then these courses must be taken as part of the program and will fulfill elective credit requirements for the major. Students with a limited number of deficiencies may be admitted, but must eliminate these deficiencies early in their graduate study. International students should also send scores of the Test of English as a Foreign Language (TOEFL), or International English Language Testing System (IELTS).

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

Assuming sufficient progress to degree, financial aid is provided to all Ph.D. students, usually in the form of grant-supported research assistantships, institutional fellowships, teaching assistantships or advanced opportunity fellowships for minority or disadvantaged students. Students are encouraged to contact individual professors in their areas of interest to determine whether support is available for working in that lab.
REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

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

MAJOR REQUIREMENTS

MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th>Mode of Instruction Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Face to Face</strong></td>
</tr>
<tr>
<td><strong>Evening/Weekend</strong></td>
</tr>
<tr>
<td><strong>Online</strong></td>
</tr>
<tr>
<td><strong>Hybrid</strong></td>
</tr>
<tr>
<td><strong>Accelerated</strong></td>
</tr>
</tbody>
</table>

Yes | No | No | No | No

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

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Credit Requirement</td>
<td>51 credits</td>
</tr>
<tr>
<td>Minimum Residence Credit Requirement</td>
<td>32 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework Requirement</td>
<td>Half of degree coursework (26 credits out of 51 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="http://my.wisc.edu/CourseGuideRedirect/BrowseByTitle">http://my.wisc.edu/CourseGuideRedirect/BrowseByTitle</a>).</td>
</tr>
<tr>
<td>Overall Graduate GPA Requirement</td>
<td>3.00 GPA required.</td>
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</table>

REQUIRED COURSES

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>M&amp;ENVTOX/ MEDICINE/ ONCOLOGY/ PHM SCI/PHMCOL-M/POP HLTH 625</td>
<td>Toxicology I</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;ENVTOX/ MEDICINE/PHM SCI/PHMCOL-M/POP HLTH 626</td>
<td>Toxicology II</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;ENVTOX/ CIV ENGR/ SOIL SCI 631</td>
<td>Toxicants in the Environment: Sources, Distribution, Fate, &amp; Effects</td>
<td>3</td>
</tr>
<tr>
<td>M&amp;ENVTOX/ AGRONOMY/ ENTOM/ F&amp;W ECOL 634</td>
<td>Ecotoxicology: Impacts on Populations, Communities and Ecosystems</td>
<td>1</td>
</tr>
<tr>
<td>OBS&amp;GYN 955/ SURG SCI 812</td>
<td>Responsible Conduct of Research for Biomedical Graduate Students</td>
<td>2</td>
</tr>
<tr>
<td>M&amp;ENVTOX 801</td>
<td>Scientific Communication in Molecular &amp; Environmental Toxicology</td>
<td>2</td>
</tr>
<tr>
<td>OBS&amp;GYN 956</td>
<td>Advanced Responsible Conduct of Research for Biomedical Students (following advancement to candidacy)</td>
<td>1</td>
</tr>
<tr>
<td>M&amp;ENVTOX 800</td>
<td>Seminar</td>
<td>1</td>
</tr>
<tr>
<td>M&amp;ENVTOX 990</td>
<td>Research</td>
<td>1-9</td>
</tr>
</tbody>
</table>

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://metc.wisc.edu/trainee-resources/handbook) is the repository for all of the program's policies and requirements.

**PRIOR COURSEWORK**

**Graduate Work from Other Institutions**

Prior coursework that a student wants to have considered must be presented within the first month of UW–Madison residency. Core courses may be appealed, subject to Graduate Achievement Committee approval. Credit total of core course exemptions will need to be made up as electives. Elective credits may be appealed, subject to Graduate Achievement Committee approval; further electives will not need to be taken.

**UW–Madison Undergraduate**

Core courses taken as an undergraduate will not need to be retaken, commonly including M&ENVTOX/MEDICINE/ONCOLOGY/PHM SCI/PHMCOL-M/POP HLTH 625 Toxicology I and M&ENVTOX/MEDICINE/PHM SCI/PHMCOL-M/POP HLTH 626 Toxicology II from the Pharm/Tox program and F&W ECOL/AGRONOMY/ENTOM/M&ENVTOX 634 Ecotoxicology: Impacts on Populations, Communities and Ecosystems in the F&W Ecol program. Equivalent number of didactic elective credits from graduate-level courses must be taken to fulfill the previously taken credits/courses.

**UW–Madison University Special**

Core courses taken as a UW–Madison University Special student will not need to be taken, commonly including M&ENVTOX/MEDICINE/ONCOLOGY/PHM SCI/PHMCOL-M/POP HLTH 625 Toxicology I and M&ENVTOX/MEDICINE/PHM SCI/PHMCOL-M/POP HLTH 626 Toxicology II, as a student prepares for the toxicology program. Equivalent number of didactic elective credits from graduate-level courses must be taken to fulfill the previously taken credits/courses.

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

To ensure that students are making satisfactory progress toward a degree, the Graduate School expects them to meet with their advisor and advisory committee on a regular (annual) basis.

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

A student’s advisory committee is made up of the thesis advisor and three-five further members, based on the needs of the student and mentor. At least one of the committee members needs to be outside of the advisor’s department and at least one of the committee members needs to be outside of the the Molecular & Environmental Toxicology Program. (This member can be one and the same).

**CREDITS PER TERM ALLOWED**

15 credits

**TIME CONSTRAINTS**

Doctoral degree students who have been absent for ten 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.

A candidate for a doctoral degree who fails to take the final oral examination and deposit the dissertation within five years after passing the preliminary examination may by require to take another preliminary examination and to be admitted to candidacy a second time.

**OTHER**

Students are funded by program dollars to do rotations during their first semester. After having settled on a lab, their research mentor will fund the student, either through his/her research grants, program-available TA-ships, or other fellowships.

**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**

**PROFESSIONAL DEVELOPMENT**

Professional development goes beyond what students do in the classroom and at the bench. It includes an array of skills and knowledge that are not often taught yet are vitally important to furthering one’s career.

All students are required to complete the AAAS Individual Development Plan (http://myidp.sciencecareers.org) following their first semester to identify strengths in their background, as well as areas where further professional development are recommended. In addition, the program encourages students to make use of the Graduate School’s DiscoverPD resource (https://my.grad.wisc.edu/DiscoverPD). Finally, students are able to track progress through annual committee meetings, at which time...
students and advisors are asked to complete an evaluation of progress and have a frank discussion about areas for improvement.

The Molecular & Environmental Toxicology Program currently recommends that students complete three units (hours/activities) per semester from the professional development areas of:

- Discipline-Specific Conceptual Knowledge
- Research Skill Development
- Communication Skills
- Professionalism
- Leadership & Management Skills
- Responsible Conduct of Research (Ethics)

The program will is developing a database of resources that will be available on the program website.

**LEARNING OUTCOMES**

1. Teach science, engaging audiences and helping them to learn.
2. Demonstrate a didactic knowledge of both molecular toxicology and environmental toxicology.
3. Design future experiments and present them as a proposal, which contains background information, experimental processes, and account for any set-backs.
4. Write for a proper audience, revising and responding to reviewers as appropriate.
5. Verbally communicate their science and do-so in a clear manner for a variety of audiences.
6. Understand that science and research is based on trust - trust between scientists and colleagues, trust between scientists and policy makers, trust between scientists and advisory boards, and trust between scientists and society.

**PEOPLE**

**Faculty:** See Faculty (http://metc.wisc.edu/people_category/faculty) on program website.