### MOLECULAR AND ENVIRONMENTAL TOXICOLOGY, M.S.

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 faculty 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

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. Applicants are required to take the Graduate Record Exam (GRE). International students should also send scores of the Test of English as a Foreign Language (TOEFL), or International English Language Testing System (IELTS).

### 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).

### FUNDING

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

The Molecular & Environmental Toxicology Program does not guarantee funding for incoming or continuing masters students. Masters students may be eligible for research assistantships, teaching assistantships, advanced opportunity fellowships for minority or disadvantaged students, or other funding opportunities. 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/#policiesandrequirementstext), in addition to the program requirements listed below.

### 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>
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</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, comprehensive educational experience.
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>Minimum Credit Requirement</th>
<th>30 credits</th>
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<tbody>
<tr>
<td>Minimum Residence Credit Requirement</td>
<td>16 credits</td>
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</tbody>
</table>

Minimum Graduate Coursework Requirement: 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 (https://registrar.wisc.edu/course-guide/).

Overall Graduate GPA Requirement: 3.00 GPA required.

Other Grade Requirements: The Graduate School requires an average grade of B or better in all coursework (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 on the non-thesis track will need to take more didactic credits to fulfill the 30 credit minimum requirement. The final examination for degree completion of the degree is a topic / literature review of toxicological relevance.

Students on the research / thesis track will be able to take 990 research credits to fulfill their 30 credit minimum requirement. The final examination for degree completion is the development of a masters thesis based on the research conducted.

Language Requirements: Contact the program for information on any language requirements.

## REQUIRED COURSES

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>M&amp;ENVTOX/</td>
<td>Toxicology I</td>
<td>3</td>
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<tr>
<td>MEDICINE/</td>
<td></td>
<td></td>
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<tr>
<td>ONCOLOGY/</td>
<td></td>
<td></td>
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<tr>
<td>PHM SCI/PHMCOL-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M/POP HLTH 625</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M&amp;ENVTOX/</td>
<td>Toxicology II</td>
<td>3</td>
</tr>
<tr>
<td>MEDICINE/PHM SCI/</td>
<td></td>
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<tr>
<td>PHMCOL-M/</td>
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<tr>
<td>POP HLTH 626</td>
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<tr>
<td>M&amp;ENVTOX 699</td>
<td>Special Problems (Directed Study Prem A)</td>
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<td>OBS&amp;GYN 955/ SURG SCI 812</td>
<td>Responsible Conduct of Research for Biomedical Graduate Students</td>
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<td>M&amp;ENVTOX 800</td>
<td>Seminar</td>
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</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 POP HLTH/M&ENVTOX/MEDICINE/ONCOLOGY/PHM SCI/PHMCOL-M 625 Toxicology I and POP HLTH/M&ENVTOX/MEDICINE/PHM SCI/PHMCOL-M 626 Toxicology II from the Pharm/Tox program and M&ENVTOX/AGRONOMY/ENTOM/F&W ECOL 634 Ecotoxicology: Impacts on Populations, Communities and Ecosystemsin 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. To ensure that students are making satisfactory progress toward a degree, the Graduate School expects them to 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.

A student’s advisory committee is made up of the thesis advisor and at least two further members, based on the needs of the student and mentor.

CREDITS PER TERM ALLOWED

12 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

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

LEARNING OUTCOMES

1. Demonstrate a didactic knowledge of both molecular toxicology and environmental toxicology.

2. 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.

3. Verbally communicate their science and do so in a clear manner for a variety of audiences.

PEOPLE

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