ENVIRONMENTAL HEALTH SCIENCES, PHD

The program in Environmental Health Sciences (EHS) offers graduate studies leading to the doctoral degree. Faculty in this program have diverse expertise in the environmental health sciences spanning a broad range of research domains including developmental toxicology, environmental toxicology and chemistry, microbial influences on water contamination, and environmental epidemiology. The EHS program through its faculty, offers students an unparalleled opportunity for cross-disciplinary training in pursuit of original and cutting-edge dissertation research. The research may involve wet lab work, animal model systems, field work, or use of human and environmental datasets. Additional laboratories and equipment are available across campus to help facilitate innovative research endeavors relevant to environmental health science.

When applying for admission, students should describe their interest in the field and any research preferences. Applicants are encouraged to review the research interests of the faculty and contact those faculty who are of interest.

Admission Requirements

Application Deadlines

Application deadlines vary by program, please review the application deadline chart (http://uwm.edu/graduateschool/program-deadlines/) for specific programs. Other important dates and deadlines can be found by using the One Stop calendars (https://uwm.edu/onestop/dates-and-deadlines/).

Admission

Applicants must meet Graduate School requirements (http://uwm.edu/graduateschool/admission/) plus the following program requirements to be considered for admission:

- A baccalaureate degree in a science discipline, or coursework commensurate with a science discipline (e.g. laboratory and basic science courses) and one statistics course.
- Submission of scores on the General Test portion of the Graduate Record Examination (http://uwm.edu/graduateschool/admission/#gre); test taken within last five years.
- Submission of at least three letters of recommendation from persons familiar with the applicant's scholarship, research achievements and potential.

For students entering with an advanced degree, credit may be given for relevant coursework following Zilber College of Public Health policies and procedures regarding course equivalencies.

Reapplication

A student who receives the Master of Public Heath degree from the University of Wisconsin-Milwaukee must formally reapply to the Zilber College of Public Health to gain admission to the PhD program in Public Health before continuing studies toward the PhD.

Credits and Courses

The PhD in Environmental Health Sciences requires 65 credits beyond the bachelor's degree. In addition to the PhD Common Core Coursework, credits include required concentration coursework (17 credits), electives (at least 12 credits), and the remaining credits taken as research.

Code	Title	Credits
Required Core PhD Courses		
PH 704	Principles and Methods of Epidemiology	3
PH 711	Intermediate Biostatistics	3
PH 801	Seminar in Public Health Research	3
PH 819	Social and Environmental Justice in Public Health	3
or PH 859	Racial/Ethnic Health Disparities in the United States	
Required EHS Track Coursework		
PH 705	Principles of Public Health Policy and Administration	3
PH 743	Environmental Risk Assessment	3
PH 745	Developmental Toxicology	3
PH 750	Seminar in Environmental Health Sciences: (Subtitled)	2
PH 808	Writing a Federal Grant in the Public Health Sciences	3
PH 821	Advanced Survey of Environmental Health	3
Research		**24**
Electives (see table below)		**12**
Total Credits		**65**

Electives are divided into three categories (molecular, organismal, and population). The student will take courses relevant to their research in consultation with their major professor.

Electives

Code	Title	Credits
Molecular Level "S "Electives		
BIO SCI 529	Molecular Biology of Microorganisms	3
BIO SCI 540	Microbial Diversity and Physiology	3
BIO SCI 564	Endocrinology	3
BMS 590	Topics in Clinical Laboratory Sciences: (Public Health Nutrition and Food Politics)	1-5
BMS 615	Cellular and Molecular Toxicology	3
CHEM 601	Biochemistry: Protein Structure and Function	3
CHEM 602	Biochemistry: Cellular Processes	3
CHEM 604	Biochemistry: Metabolism	3
Organismal Level "S" Electives		
BIO SCI 401	Immunology	3
IND ENG 580	Ergonomics	3
IND ENG 780	Advanced Ergonomics - Low Back Pain	3
IND ENG 783	Advanced Ergonomics - Upper Extremity	3
Population Level "S" Electives		
FRSHWTR 506	Environmental Health of Freshwater Ecosystems	3
GEOG 520	Physical Geography of the City	3

GEOG 945	The Internal Structure of the City	3
PH 721	Introduction to Translational Bioinformatics	3
PH 741	Environmental Public Health Microbiology	3
PH 762	Environmental Epidemiology	3
URBPLAN 760	Public Sector Influence on Real Estate Development	3
URBPLAN 771	Transportation Policy and Planning	3
URBPLAN 791	Introduction to Urban Geographic Information Systems for Planning	3
URBPLAN 792	Using Urban Geographic Information Systems (GIS) for Planning	3
URBPLAN 794	Internet Geographic Information Systems (GIS)	3

Other courses as approved by advisor.

Additional Requirements

Major Professor as Advisor

As specified in Graduate School regulations, each student in the EHS PhD program must have a major professor to advise and supervise their studies. Typically, a student is matched with a major professor during admission to the program, based on a fit of research interests. The major professor serves as the student's research mentor and will guide the student in course selection and research design.

Residence

The student must complete 8 to 12 graduate credits in each of two consecutive semesters, or 6 or more graduate credits in each of three consecutive semesters, exclusive of summer sessions. Residence requirements cannot be met at the master's level.

Academic Advisory Committee

During the spring of the first year in the program, the student should form an academic advisory committee which is to consist of the student's advisor and two faculty members from within the Zilber College of Public Health primary public health faculty.

Doctoral Qualifying Exam

Within 30 days following the second semester of enrollment, the student is required to pass a qualifying exam that is scheduled with a 2-hour time block. The student will give an oral synopsis/self-evaluation of their first year in the program describing highlights from their coursework and will discuss their specific interests in environmental health that they plan to evolve into a dissertation project. The academic advisory committee will evaluate if the student has demonstrated a knowledge base in Public Health that was to be firmly established in the first year of coursework. The academic advisory committee in conjunction with the student will also map out the remaining coursework that needs to be completed by the end of the third year in the program. Students failing the qualifying exam will not be allowed to continue in the program and will forfeit their TAship, PAship, or RAship if applicable.

PhD Advisory Committee

The student, in consultation with the Major Professor, will select four or five additional members to form a PhD Advisory Committee (i.e. dissertation committee). This is typically done during the second or third year in the program in conjunction with the emergence of the student's dissertation idea. A minimum of three committee members (including the major professor) must be EHS program faculty. See the Graduate School Doctoral Requirements (http://uwm.edu/graduateschool/doctoral-requirements/) page for more information on the doctoral committee.

Doctoral Preliminary Examination

This examination must be taken no later than the end of the third year of study. In order to take the preliminary exam, all formal coursework must be completed with a cumulative GPA of 3.0 or higher. The preliminary examination consists of both written and oral components. The written component will consist of the student presenting their dissertation proposal to the PhD Advisory Committee. In the "General Public Health Knowledge Phase" of the preliminary examination, the student will be evaluated (via oral questioning) by the PhD Advisory Committee to determine if the student has truly acquired Public Health competencies which should have been acquired by completion of the formal coursework in the EHS PhD program. A student who fails the doctoral preliminary examination will be dismissed from the program.

Dissertator Status

Specific requirements which must be completed before a doctoral student qualifies for dissertator status are described on the Graduate School Doctoral Requirements (http://uwm.edu/graduateschool/doctoral-requirements/) page.

Dissertation

Doctoral students should be aware that the research component is extremely important and requires significant time allocation. Students should be aware that if full-time commitment to dissertation research is not given, that the time to graduation may be extended by many years, jeopardizing degree completion. Successful doctoral students in our EHS program should anticipate working long hours, including on weekends, winter intersession and summer months. Students are also expected to enroll in, and successfully complete research credits. Six or more of these research credits must be obtained at the level of dissertator.

All successful doctoral students must prepare and successfully defend a dissertation reporting the results of their research. A full time student who does not pass the dissertation defense within six years of admission may be required to take another preliminary examination and be readmitted to the program.

Time Limit

The student must complete all requirements for the degree within 10 years of the date of initial enrollment in the program.

Environmental Health Sciences PhD Learning Outcomes

Doctoral students in Environmental Health Sciences can expect to:

1. Apply public health science theories, principles, and methods when developing and implementing public health programs and research.
2. Correlate issues of population diversity and social justice with principles of environmental and occupational health.
3. Describe the major environmental and occupational agents and their effects on human populations and the environment.
4. Describe genetic, physiologic and environmental factors that affect susceptibility to adverse health outcomes following exposure to common hazards.
5. Explain current environmental risk assessment methods.

6. Describe approaches for detecting, preventing and controlling environmental hazards that pose risks to human health and safety.
7. Identify the general mechanisms and/or modes of action of agents in creating an adverse response to environmental exposures via various routes and doses.
8. Develop an original hypothesis and design research studies to test it, and then conduct appropriate research and results synthesis to produce a definitive result.
9. Demonstrate acceptable skills in scientific writing and oral presentation to both scientific audiences and the general public.
10. Demonstrate knowledge of relevant literature for a selected area of study, including identification of knowledge gaps.

PhD Core Learning Outcomes

Doctoral students in all public health programs can expect to:

1. Formulate and test a hypothesis using basic statistical methods.
2. Apply statistical inference to guide research decision-making relevant to public health problem and issues.
3. Evaluate *critically* scientific literature and identify how epidemiological and population health data can be used to answer research questions and inform program development and policy decisions aimed at promoting health equity.
4. Demonstrate critical thinking skills necessary for formulating research questions, identifying theory to frame research questions, and identify and employ appropriate methodologies for addressing a public health research question.
5. Apply social and environmental justice framework when asking and addressing research questions impacting the public's health.