

**Degree Requirements and Competencies for the PhD in Environmental Health Sciences  
Area of Emphasis: Environmental Toxicology (effective summer 2022)**

**Required Coursework**

	Credits
<b>DEOHS Common Core</b>	
<b>BIOST 511</b> ( <i>Medical Biometry I</i> , Autumn)	4
<b>BIOST 512</b> ( <i>Medical Biometry II</i> , Winter)	4
<b>EPI 511</b> ( <i>Introduction to Epidemiology</i> , Autumn)	4
<b>ENV H 501</b> ( <i>Foundations of Environmental &amp; Occupational Health</i> , Autumn)	4
<b>ENV H 502</b> ( <i>Assessing &amp; Managing Risks from Human Exposure to Environmental Contaminants</i> , Winter)	4
<b>ENV H 503</b> ( <i>Adverse Health Effects of Environmental and Occupational Toxicants</i> , Autumn)	4
<b>ENV H 580</b> ( <i>Environmental and Occupational Health Sciences Seminar</i> , Autumn/Winter/Spring)	6 x 1 = 6 <sup>1</sup>
<b>ENV H 595</b> ( <i>Research Rotation</i> , All Quarters)	2 x 3 = 6 <sup>2</sup>
<b>Area of Emphasis: Environmental Toxicology</b>	
<b>ENV H 515</b> ( <i>Organ System Toxicology</i> , Winter)	3
<b>ENV H 516</b> ( <i>Toxic Agents: Effects and Mechanisms</i> , Spring)	3
<b>ENV H 577</b> ( <i>Risk Assessment for Environmental Health</i> , Autumn)	3
<b>ENV H 591</b> ( <i>Current Topics in Toxicology</i> , Winter)	2
<b>ENV H 593</b> ( <i>Current Topics in Risk Assessment</i> , Autumn/Spring)	2
Choose two from the following: <b>ENV H 531</b> ( <i>Neurotoxicology</i> , Winter in even years, 3 cr.) <b>ENV H 532</b> ( <i>Reproductive and Developmental Toxicology</i> , Winter in even years, 3 cr.) <b>ENV H 533</b> ( <i>Molecular Toxicology</i> , Quarter TBD, 3 cr.) <b>ENV H 567</b> ( <i>Mechanisms of Carcinogenesis</i> , Quarter TBD, 2 cr.)	5 (min.)
<b>Elective Courses</b> <sup>3</sup>	≥ 8
<b>Culminating Experience (Thesis)</b>	
<b>ENV H 583</b> ( <i>Thesis Proposal Preparation</i> , Spring)	1
<b>ENV H 800</b> ( <i>Doctoral Dissertation</i> , All Quarters)	27
<b>Total Minimum Credits</b>	<b>90</b>

1. Six quarters of ENV H 580 are required for a total of 6 credits.
2. Students who enter the program with a previous master's degree are required to do two rotations of 3 credits each for a total of 6 credits. Students who enter the program without a master's degree are required to do three rotations of 3 credits each for a total of 9 credits.
3. Student works with their faculty adviser to identify additional courses to reach or exceed the total minimum credit requirement. Elective courses can be ENV H courses or courses from other prefixes (e.g., EPI, BIOST, GH, etc.).

# **Degree Requirements and Competencies for the PhD in Environmental Health Sciences**

## **Area of Emphasis: Environmental Toxicology (*effective summer 2022*)**

### **Additional Requirements**

Students in this degree program are required to:

- Complete a minimum of two research rotations (see footnote #2 above).
- Pass a qualifying exam, typically at the end of their first year of study.
- Pass a general exam.
- Research, prepare, defend, and submit a dissertation.

### **Degree Competencies**

*Upon completion of this degree program, you will be able to:*

#### **School of Public Health -- All MS Students**

- Explain public health history, philosophy and values
- Identify the core functions of public health and the 10 Essential Services
- Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health
- List major causes and trends of morbidity and mortality in the US or other community relevant to the school or program
- Discuss the science of primary, secondary and tertiary prevention in population health, including health promotion, screening, etc.
- Explain the critical importance of evidence in advancing public health knowledge
- Explain effects of environmental factors on a population's health
- Explain biological and genetic factors that affect a population's health
- Explain behavioral and psychological factors that affect a population's health
- Explain the social, political and economic determinants of health and how they contribute to population health and health inequities
- Explain how globalization affects global burdens of disease
- Explain an ecological perspective on the connections among human health, animal health, and ecosystem health (e.g., One Health)
- Recognize the means by which social inequities and racism, generated by power and privilege, undermine health

## **Degree Requirements and Competencies for the PhD in Environmental Health Sciences** **Area of Emphasis: Environmental Toxicology (*effective summer 2022*)**

### **DEOHS -- MS in Environmental Health Sciences**

- Apply the major components of the environmental and occupational health framework (problem formulation, hazard identification, dose-response assessment, exposure assessment, risk characterization, risk communication, risk management, evaluation, stakeholder engagement, and research) in order to address environmental public health problems experienced in the community or work environment
- Use epidemiological and statistical techniques to describe and analyze environmental and occupational health data

### **DEOHS -- PhD in Environmental Health Sciences**

- Conceive, develop, conduct, and document original research that advances knowledge in the field of environmental health sciences

### **DEOHS – Area of Emphasis: Environmental Toxicology**

- Define the major classes of toxicants present in the environment and the workplace and describe their sources, pathways, and routes of exposure
- Describe and analyze how toxicants interact with biological systems and the mechanisms by which they elicit adverse effects in humans and other organisms
- Explain the core principles of research ethics and apply these principles to specific research projects
- Conceive, develop and conduct original research that advances knowledge in the field of environmental toxicology
- Apply advanced knowledge and methodologies from supporting disciplines (e.g., molecular biology, biochemistry, physiology, pathology) to original research in environmental toxicology
- Demonstrate the ability to effectively communicate original research findings both orally (e.g., at a scientific conference) and through preparation of an original manuscript suitable for publication in a peer reviewed journal in the field of environmental toxicology