School of Public Health
Department of Environmental and Occupational Health

Environmental and Occupational Health Sciences Master of Science Overview

Updated: 2/23/2023

1. **Program Objective**

The objective or the Environmental Health Sciences training program is to provide a broad theoretical and practical education for individuals who desire positions in academic, industrial or government positions as teachers, researchers, or regulators in the multifaceted discipline of Environmental Health Science with an emphasis on environmental impact on human disease risk and disease susceptibility. The Environmental Health Sciences program is designed as an integrated modern curriculum combining the training in toxicology, environmental biophysics, and exposures that are traditional to the Department of Environmental and Occupational Health with the new and continually developing fields of cellular and molecular pathobiology of environmental disease and gene-environment interactions. The program provides an understanding of how relevant environmental exposures, laboratory-based model systems, and gene-environment responses can be interpreted and applied to the study of disease etiology in exposed and potentially exposed human populations.

2. Curriculum Design

The curriculum is designed to provide flexibility for students to pursue training in varied research focus areas, such as environmental biophysics, cell and molecular pathophysiology, gene-environment analysis, exposure science, and risk assessment. The design allows integration of laboratory, field, and data analysis-based graduate training and research in the Department of Environmental and Occupational Health. The curriculum combines core courses in Environmental Health Sciences with electives throughout the University that will enhance training in the student's specific focus area. All of these resources are dedicated to the thematic teaching and laboratory research focus centered on training at the doctoral (Ph.D.) level. However, M.S. students are enrolled into the Environmental Health Sciences Training Program, with curricular emphasis directed towards obtaining theoretical underpinning in the environmental health sciences with more limited involvement in laboratory-based research.

3. Training Goals

A student completing the Environmental Health Sciences M.S. Training Program shouldhave developed many of the ASPH core competencies in environmental health.

They should be able to:

- understand basic theoretical background in cellular, molecular, and genetic etiology of environmental disease and disease susceptibility.
- understand direct and indirect human, ecological, and safety effects of environmental andoccupational hazards.
- acquire a basic understanding of genetic and physiological factors that affect susceptibility toadverse health outcomes following exposure to environmental hazards.
- integrate and understand basic knowledge of exposures and molecular mechanisms of action toinvestigate hypotheses that address the environmental basis of human disease.

Students completing the core curriculum and progressing to the MS degree will not be required to perform thesis research but will be responsible for completing and writing a theoretical thesis. The MS students do have option to perform one term of research that can be used for a more applied thesis. MS students

Admission Requirements
Students seeking to join the M.S. Training Program Environmental Health Sciences must meet the general admission requirements of the University of Pittsburgh School of Public Health. These include the following.

- A bachelor's degree from an accredited college or university (or the equivalent of a U.S. bachelor's degree) with a grade point average of at least a B (3.0).
- Three college credits in human biology with a grade or B or better.
- Three college credits in algebra or higher-level mathematics with a grade of B or better.
- Six college credits in behavioral sciences, including a course in sociology or social psychology and additional credits in such subjects as sociology, anthropology, psychology, political science, or economics.
- Minimum total TOEFL score (if applicable) of 105.
- Comparable scores from other agencies, such as Duolingo will be considered.

In addition, the following departmental requirements and guidelines apply.

- Candidates must have a degree or career background in a discipline relevant to public health or health sciences.
- Additional requirement of two courses in each of the following disciplines, calculus, biology, physics, and organic chemistry.

Applicants who are graduates of a recognized college or university, but who do not qualify for admission to full graduate status because of deficiencies in either their undergraduate course program or their scholastic achievement, may be considered for MS candidate or provisional graduate status if strong supporting evidence of their ability to successfully complete the program is provided. Courses taken to remove deficiencies do not count toward completion of graduate degree requirements.

Applicants who have a graduate degree (e.g. M.S., M.D., M.P.H.) may be exempt from taking individual core courses based on their past transcripts and clear demonstration that they are competent in the topics covered in the core course exempted. Credit can be given for these courses (all if courses were taken at the University of Pittsburgh or a maximum of 24 credits from other institutions).

Environmental and Occupational Health Sciences Master of Science Course Requirements

A **minimum of 42 credits** is required for the MS degree. This total is made up of the GSPH core courses, a core of required courses in the Department of Environmental and Occupational Health and a broad list of electives that utilize coursework from various relevant disciplines in the school.

Required Core Courses	**Complete?**	**Credits**
BIOST 2041 Intro to Statistical Methods 1		3
BIOST 2049 or Applied Regression Analysis		3
PUBHLT 2011 Essentials of Public Health		3
PUBHLT 2022 Public Health Grand Rounds (Semester one)		0
PUBHLT 2022 Public Health Grand Rounds (Semester two)		0
EPIDEM 2110 Principles of Epidemiology		3
EOH 2175 Principles of Toxicology		3
EOH 2310 Molecular Fundamentals		3
EOH 2504 Principles of Environmental Exposure		3
EOH 3210 Pathophysiology of Environmental Disease		3
EOH 2109 Journal Club (Semester one)		1
EOH 2109 Journal Club (semester two)		1
EOH 2109 Journal Club (semester three)		1
EOH 2109 Journal Club (Semester four)		1
EOH 2021 Special Studies: MS Essay		2
Total Required CORE Credits		**30**
Recommended Electives		
EOH 2609 Chemical Toxicology in the Age of Green Chemistry.		3
EOH 2122 Transport & Fate of Environmental Agents		3
EOH 2180 Introduction to Risk Assessment (taken with EOH 2181)*		1
EOH 2181 Risk Assessment Practicum*		2
EOH 2805 Epigenetics and epigenomics of environmental health		3
Other eligible electives are any graduate level courses at the University.		6 + Credits
EOH 2021 Special Studies: Research		1-15
Total Required Credits for MS		**42**

*Note that these two courses are listed separately but are expected to be taken together as a 3 credit course.

EOH MS Suggested Timeline for Completion of Coursework

FALL TERM – YEAR 1	
*Note that some courses are given in alternate years	
Course	**10-14 Credits**
EOH 2175 Principles of Toxicology or EOH 2310 Molecular Fundamentals*	3
BIOS 2041 Intro to Biostatistics	3
EPIDEM 2110 Principles of Epidemiology	3
PUBHLT 2022 Public Health Grand Rounds (Semester one)	0
EOH 2109 Journal Club	1
SPRING TERM – YEAR 1	
PUBHLT 2011 Essentials of Public Health	3
EOH 2180 Introduction to Risk Assessment/EOH 2181 Risk Assessment Practicum or EOH 3210 Pathophysiology of Environmental Disease*	3
BIOST 2049 or Applied Regression Analysis	3
PUBHLT 2022 Public Health Grand Rounds (Semester one)	0
EOH 2109 Journal Club	1
SUMMER TERM – YEAR 1	
EOH 2021 Special Studies Thesis Research	
FALL TERM – YEAR 2	
EOH 2175 Principles of Toxicology OR or EOH 2310 Molecular Fundamentals*	3
EOH 2504 Principles of Environmental Exposure	3
Elective	3
EOH 2109 Journal Club	1
EOH 2021 Special Studies	1-6
SPRING TERM – YEAR 2	
EOH 2180 Introduction to Risk Assessment/EOH 2181 Risk Assessment Practicum or EOH 3210 Pathophysiology of Environmental Disease*	3
Recommended: EOH 2609 Chemical Toxicology in the Age of Green Chemistry.	3
Elective	3
EOH 2109 Journal Club	1
EOH 2021 MS Essay	2

Partial listing of elective EOH courses	**Credit**
EOH 2013 Environmental Health and Disease	3
EOH 2122 Transport and Fate of Environmental Agents	3
EOH 2180 Introduction to Risk Sciences	1
EOH 2181 Risk Assessment Practicum	2
EOH 2609 Chemical Toxicology in the Age of Green Chemistry.	3
EOH 2805 Epigenetics and Epigenomics of Environmental Health	3
EOH 3305 Genome Instability and Human Disease	3

*In addition to electives offered in EOH, students can select from any graduate level course across the University.

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MS Advising: Each Term, the Program Director and EOH Graduate Advisory Committee advises students and aids in course selection before they chose a thesis advisor.

MS Thesis: The thesis should report on original research by the student. This research can either be novel data collection, adding additional laboratory assays or genetic evaluation to existing data sets, novel use of existing data such as applying a new analytical technique or combining existing data sets, development of a new protocol for acquiring data, or scholarly literature review, meta-analysis, or systematic review.

Through this process the student should demonstrate that they understand basic principles of environmental health science and the rigorous and ethical collection and interpretation of data.

MS Thesis Committee: The student should form their thesis committees by the end of the semester prior to the one in which they plan to graduate. The committee must consist of at least three University of Pittsburgh faculty members, one of which must be the students' academic advisor, although the academic advisor does not have to be the Committee chair. Half or more of the members must be EOH core faculty and one member should be a SPH faculty member outside of SPH. Graduate faculty status is not required. The student should describe their proposed thesis project to each committee member at the time of committee formation so that committee members can determine whether the thesis topic is suitable. The MS thesis committee must be registered with and approved by Student Affairs.

MS Thesis Timeline: The thesis committee should be formed and approved at the end of the term prior to the term in which the student is graduating. The comprehensive exam should be scheduled at least one month prior to the end of the graduating term and the student should submit the first draft of the thesis (introduction and methods) to the committee at least two weeks prior to the comprehensive exam. The Final defense should be at least two weeks prior to the SPH deadline for the term. Note that the committee may require revision of the written document prior to the SPH deadline for submitting. The student must follow the current guidelines and submission dates for the electronic version of the thesis.