University of Pittsburgh
Graduate School of Public Health
Department of Environmental and Occupational Health

Environmental Health Sciences Doctor of Philosophy/Masters of Science Degree Programs

Updated: 12/17/2018

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 Ph.D. /M.S. Training Program should have developed many of the ASPH core competencies in environmental health.

They should be able to:

- demonstrate basic theoretical background in cellular, molecular, and genetic etiology of environmental disease and disease susceptibility.
- explain direct and indirect human, ecological, and safety effects of environmental and occupational hazards.
- apply basic understanding of genetic and physiological factors that affect susceptibility to adverse health outcomes following exposure to environmental hazards.
- integrate reading of scientific literature to develop testable hypotheses and hypothesis-driven research.
- integrate and apply basic knowledge of exposures and molecular mechanisms of action to investigate hypotheses that address the environmental basis of human disease.

Students completing the core curriculum and progressing to the Ph.D. will be required to conduct original research with a faculty member within the Environmental Health Sciences Training Program. It is expected that students in the Ph.D. track will produce a minimum of two first authored peer-reviewed manuscripts that are either published or deemed of a quality that merits publication on or before the time of their thesis defense.

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 theoretical thesis. The MS students do have option to perform one term of research that can be used for a thesis.

Admission Requirements

Students seeking to join the Ph.D/M.S. Training Program Environmental Health Sciences must meet the general admission requirements of the University Of Pittsburgh Graduate 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.

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.
- GRE scores must be submitted unless applicant has graduate degree from an accredited institution in the United States (or equivalent) and waiver is granted by the department.
- 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 Masters 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).

PhD Degree Requirements

A **minimum of 72 credits** is required for the PhD. 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?**	**32 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 OR EOH 2122 Transport & Fate Environmental Agents		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 2110 Rotation Practicum (Semester one)		2
EOH 2110 Rotation Practicum (semester two)		2
Electives:		**12+ Credits**
Research:		**___ Credits**
EOH 2021 Special Studies (1-15 crs)		
EOH 2021 Special Studies (1-15 crs)		
EOH 2021 Special Studies (1-15 crs)		
EOH 3010 Research and Dissertation (1-15 crs)		
FTDR 3999 Full Time Dissertation Study		0
Total Required CORE Credits		**32**
Transfer Credits from previous Degree		**Up to 24**
Total Required Credits for PhD		**72**

*In addition to electives offered in EOH, students can select from any elective course offered through training programs in GSPH provided that approval is granted by the EOH Graduate Advisory Committee.

MS Degree Requirements

A **minimum of 42 credits** is required for the PhD. 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?**	**32 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 OR EOH 2122 Transport & Fate Environmental Agents		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
Electives:		**12+ Credits**
Research:		**___ Credits**
EOH 2021 Special Studies (1-15 crs)		
EOH 2021 Special Studies (1-15 crs)		
Total Required CORE Credits		**32**
Total Required Credits for MS		**42**

*In addition to electives offered in EOH, students can select from any elective course offered through training programs in GSPH provided that approval is granted by the EOH Graduate Advisory Committee.

MS/PhD - Timeline for Completion of Coursework

FALL TERM – YEAR 1	
Course	**12-15 Credits**
EOH 2175 Principles of Toxicology or EOH 2310 Molecular Fundamentals	3
BIOST 2041 Intro to Statistical Methods 1	3
EPIDEM 2110 Principles of Epidemiology	3
EOH 2110 Rotation Practicum (Semester 1) PhD only	2
EOH 2109 Journal Club	1
PUBHLT 2022 Public Health Grand Rounds (Semester one)	0
SPRING TERM – YEAR 1	
EOH 3210 Pathophysiology Environmental Diseases (when offered)	3
EOH 2122 Transport & Fate of Environmental Agents (option if not taking EOH 2504 Exposures)	3
BIOSTAT 2049 Applied Regression Analysis	3
PUBHLT 2011 Essentials of Public Health	3
EOH 2110 Rotation Practicum (Semester 2) PhD only	2
Elective (when EOH 3210 is not offered)	3
EOH 2109 Journal Club	1
PUBHLT 2022 Public Health Grand Rounds (Semester two)	0
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SUMMER TERM – YEAR 1	
EOH 2021 Special Studies	3
FALL TERM – YEAR 2	
EOH 2175 Principles of Toxicology or EOH 2310 Molecular Fundamentals	3
EOH 2504 Principles of Environmental Exposure (option if not taking EOH 2122 Fate & Transport)	3
Electives	2-3
Electives	2-3
EOH 2109 Journal Club	1
EOH 2021 Special Studies	1-15
SPRING TERM – YEAR 2	
EOH 3210 Pathophysiology Environmental Diseases (when offered)	3
Elective	2-3
EOH 2109 Journal Club	1
EOH 2021 Special Studies	1-15
SUMMER TERM – YEAR 2	
EOH 2021 Special Studies	1-15
PhD SPRING/Summer/FALL - YEAR 3+	
EOH 3010 Research and Dissertation	1-15
FTDR 3999 Full Time Dissertation Study	0

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 2313 Bioinorganic Chemistry for Toxicologists	3
EOH 2504 Principles of Environmental Exposure	3
EOH 3305 Genome Instability and Human Disease	3

*In addition to electives offered in EOH, students can select from any elective course offered through training programs in GSPH provided that approval is granted by the EOH Graduate Advisory Committee.

Examinations:

Preliminary Examination (Qualifying examination for Ph.D. students)

- **Prerequisites:** Students must have completed two full semesters of their required core coursework and achieved a GPA of 3.0 or better prior to taking the Preliminary Examination. Students can take their examination no sooner than the end of their first spring semester and no later than the end their second spring semester.

- **Written Component:** The student will write the equivalent of an F31/R21 type grant application (i.e. two years' worth of research) on the topic of their proposed thesis research. The student must use the standard NIH format guidelines (PHS 398, https://grants.nih.gov/grants/funding/phs398/phs398.pdf) to create a well-written and defensible grant application that contains: a title page, abstract, public health statement, single page specific aims, six page research plan, vertebrate animal/Human subject use, and references. The PHS 398 guidelines for title length and page limits will be strictly enforced. When the student is ready to take the exam, they should contact the Graduate Program Committee and start the schedule. Within a week of starting, the student will present a draft of the specific aims to the Chair of the examination committee. Once the aims are approved, the student will have one month to write the grant application, after which time he/she must submit a complete pdf application to the examining committee. The student may seek advice from other faculty members in general aspects of the grant content and the student's research advisor can provide advice in general grantsmanship and composition. However, the proposal must be the student's original ideas and work. The written document will be evaluated by the committee for quality and to decide whether the student can advance to an oral defense of the grant application.

- **Examining Committee:** The committee will be selected by the Graduate Program Committee based upon topic and content of the written proposal. The examining committee will be composed of:
  - one of the four standing faculty members of the EOH Graduate Program Committee
  - one member of the EOH Graduate Faculty
  - one Graduate Faculty member in another GSPH or University of Pittsburgh department.
  - The student's research advisor will participate in the examination as a silent observer of the proceedings.

- **Oral Defense of the Written Examination:** The oral examination should be scheduled no sooner than 2 weeks after submitting the written document to the Examining Committee. The examination will start with the student summarizing key elements of the proposal (not to exceed 30 minutes). The examining committee will question the candidate with the goal of revealing strengths and weaknesses of the written proposal in addition to determining whether the student demonstrates a reasonable command of the required curriculum. Oral defense of the written proposal will proceed in an open-ended fashion until each member of the Examining Committee can make an appropriate assessment of the candidate's performance. After a reasonable period of consultation in the absence of the candidate, the Examining Committee will make a pass/fail vote, the result of which will be determined by a majority decision. The entire examination process cannot take longer than two hours. Students failing the Preliminary Examination will be allowed to re-take the examination any time up to the end of their Third fall semester or 3 months following their first attempt, which ever is sooner.

Comprehensive Examination (Ph.D. Dissertation Overview) – The comprehensive examination and approval of dissertation research should be complete no later than one semester following the preliminary examination. This examination will be a presentation of their dissertation research proposal, both in writing and orally, to their Research Advisory Committee. The Advisory Committee must critique the research proposal, upon which the student will make appropriate revisions prior to committee approval.

Dissertation Defense (Ph.D. degree) – Once approved by their Research Advisory Committee, the student will be allowed to prepare their thesis. The content of the thesis will be presented in an open seminar followed by questions from the audience. The open seminar must be advertised across the University at least two weeks prior to presentation and should be scheduled when the Department Chair can attend. The student will be required to defend the thesis in a closed session. The closed session of the Dissertation Defense will be administered by the Dissertation Defense Committee, which will make a recommendation at the completion of the defense regarding the suitability of the written document, the ability of the student to defend its content, and whether the student should be awarded a Ph.D degree.

MS Comprehensive Exam (Defense of the Masters Thesis) – A written thesis is required for completion of the EHS M.S. degree. M.S. students will prepare a written thesis according to GSPH guidelines on a topic selected by the student and approved by both their advisor and the EHS Graduate Program Committee. As a comprehensive examination, the student will be required to defend the thesis in a closed session. The closed session of the Masters Thesis Defense will be administered by the Thesis Defense Committee, which will make a recommendation at the completion of the defense regarding the suitability of the written document, the ability of the student to defend its content, and whether the student should be awarded a MS degree. The MS Thesis Defense Committee should be approved by GSPH and consist of:

- at least three University of Pittsburgh faculty members.
- Half or more of the members must be on the core faculty list of at least one GSPH department.

- One of the Pitt faculty on the committee must not be on the core list from the student's department.
- If thesis work includes internship/practica experience, including data and policies, from the Allegheny County Health Department the committee must include a preceptor from the Allegheny County Health Department. If the preceptor is an adjunct faculty member, they count as a faculty member. If they do not hold an adjunct appointment, they must be added in addition to all faculty on the committee.

Oversight of student progress:

Program Director: Oversees all functions of the Environmental Health Sciences Training Program and is responsible for final decisions following consultation with the Department Chair and the EHS Graduate Program Committee.

EHS Graduate Program Committee: Composed of three to four faculty members with faculty serving three year terms (1 new member each year). The chair of the committee is the longest-standing faculty member at any one time. Roles for this committee are to:

1) Oversee progress of individual students in their coursework and make appropriate recommendations.
2) Mentor students prior to their selection of a permanent advisor
3) Oversee Preliminary Examination for Ph.D. students.
4) Oversee Thesis Defense Examination for M.S. students

S/A Department Coordinator*:* manages student affairs and ensures that students meet appropriate deadlines for their progression along the Ph.D. and M.S. tracks..

Research Advisor: Selected by student after completion of a minimum of two and maximum of three eight-ten week research rotations (of which only 2 count for credit) and prior to taking Preliminary Examination (see later). The research advisor and student propose a Research Advisory Committee that must be approved by the EHS Graduate Program Committee and GSPH. Note that the research advisor cannot chair the Research Advisory Committee.

Research Advisory and Dissertation Defense Committee (Ph.D. students)**:** Responsible for assisting the primary research advisor and the student in the focus and direction of the student's research. This committee should meet twice annually and must sign an evaluation form completed by the student and his/her mentor at each committee meeting. Evaluations are submitted to the EHS Graduate Program Committee and failure to report evaluations will result in students losing their GSR support. The Research Advisory Committee also conducts the student's dissertation defense and must sign the appropriate forms following its successful completion. This committee is composed of:

- at least four University of Pittsburgh faculty members including the research advisor. The Research Advisor should be a member of the Graduate Faculty.
- at least two EOH faculty members.
- at least one University of Pittsburgh faculty member from outside the Department.
- Additional members of the committee can be faculty outside of the University of Pittsburgh.

- A majority of the committee must be Graduate faculty at the University of Pittsburgh.
- The Chair of the Research Advisory Committee must be an EOH and Graduate Faculty member and cannot be the Research Advisor.

Independent Development Plan: The independent development plan is a guiding document that will be completed by the student and advisors upon matriculation into the program. The program develops the student's expectations and goals for advancement through the program and towards the next stage of career development. Before the student identifies a faculty mentor to guide their research and development, the Graduate Program Committee will serve as the advisors for completing the development plan. The plan will be reviewed and updated each year and at each critical step in the program (e.g. qualifying and comprehensive examinations). The independent development plan and documented updates will be kept in the student's file.

***Student Performance*:** The criteria for evaluation of student performance and the procedures for dismissal will be the same for students in this program as for all other GSPH students. Students must maintain a B or better average in courses to be eligible to take the Ph.D. qualifying exam. Student performance will be evaluated at each of the major milestones of the student's tenure in the department (e.g. completion of laboratory rotations, qualifying examination, comprehensive examination, and dissertation defense). Performance will be reviewed by the EHS Graduate Program Committee.