

**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: 4/16/2015**

## **1. Program Objective**

The objective of 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 of 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).

### Coursework

A minimum of 42 credits is required for the M.S. and 72 for the Ph.D. in Environmental Health Sciences. In each case, this total includes a core of required Environmental Health Sciences (EOH) courses and a broad list of electives that includes graduate level coursework from EOH and relevant disciplines in the University.

### Program required courses and partial listing of elective courses for GSPH students entering the MS/Ph.D. Program in Environmental Health Sciences.

<b>Core Courses</b>			Credits
BIOS 2041/2041	Introduction to Statistical Methods 1/2	Wilson	6
EOH 2175	Principles of Toxicology	Fabisiak	3
EOH 2310	Molecular Fundamentals	Opresko/Di	3
EOH 2504 or EOH 2122	Principles of Environmental Exposure Transport and Fate of Environmental Agents	Clougherty Peterson	3
EOH 2314	Pathophysiology of Environmental Diseases	St. Croix	3
EOH 2109	Journal Club	Gandy	1/term
EOH 2110	Research Rotations (mandatory 2)	Faculty	4
PUBHLT 2011	Essentials of Public Health	Martinson	3
EPIDEM 2110	Principles of Epidemiology	Songer	3
<b><u>Electives</u></b>			
Electives include any graduate level EOH, GSPH, School of Medicine, or University course that would satisfy the student's interest and research needs. Guidance will be provided by the EHS Graduate Program Committee and the student's faculty mentor to prepare suggested course list for students who desire focus in cell and molecular mechanisms of environmentally-derived disease, environmental chemistry, exposure science, or environmental biophysics tracks. Mandatory 12 credits			
Partial listing of elective EOH courses.			credits
EOH 2013	Environmental Health and Disease	Barchowsky	3
EOH 2106	Environmental and Occupational Health Law	Mendeloff	2
EOH 2122	Transport and Fate of Environmental Agents	Peterson	3
EOH 2505	Principles of Environmental Exposure	Clougherty	3
EOH 2180	Introduction to Risk Sciences	Fabisiak	1
EOH 2176	Principles of Toxicology Conference (mechanisms track only)	Fabisiak	2
EOH 2313	Bioinorganic Chemistry in Public Health	Peterson	3
EOH 2513	Policy Decision Making in public health emergency and bioterrorism.	Potter	2
EOH 3305	DNA Repair: Biochemistry to Human Disease	Opresko	3

### **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.

**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.

**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.

**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 is composed of at least four University of Pittsburgh faculty members. These include the Research Advisor, at least two faculty members from with EOH, and 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. 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.

**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.

## **Examinations:**

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

- **Prerequisites:** Students must have completed 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 start of their second spring semester and no later than the end their third fall semester.
- **Written Component:** The student will be given a current NIH or equivalent request for proposals (R.F.A) on a topic chosen by the EHS Graduate Program Committee. The student must use this RFA as a guideline to create a well written and defensible grant application in the format of the research design portion of an NIH postdoctoral National Research Scientist Award (NRSA) application (see [http://grants.nih.gov/grants/funding/424/SF424\\_RR\\_Guide\\_Fellowship\\_VerB.pdf](http://grants.nih.gov/grants/funding/424/SF424_RR_Guide_Fellowship_VerB.pdf) section 5 pages I-80-87 for format and page limits). The student will have 1 month to prepare the grant, after which time he/she must submit complete copies to each member of 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 idea 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 examining committee will be composed of one of the four standing faculty members of the EHS Graduate Program Committee and at least one member of the EOH Graduate Faculty, and one Graduate Faculty member in another GSPH or University of Pittsburgh department. The committee will be selected by the Graduate Program Committee based upon content of the RFA and written proposal. 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. 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 and the ability of the student to defend its content.

***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. 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 and the ability of the student to defend its content.

### **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. 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.