Curriculum of the Environmental Health Sciences Ph.D. Program

The Environmental Health Sciences (EHS) doctoral program focuses on how environmental agents – physical, chemical, and biological – affect human health, considered within the general framework of epidemiology and public health. Students will be skilled in research, assessment, and evaluation of the impact of environmental stressors; they will identify potentially adverse environmental agents, assess their exposures, determine their impact on health, and estimate the consequent risk.

Students may choose the Environmental Epidemiology & Exposure Science concentration or the Environmental & Molecular Toxicology concentration as noted below. Students must declare their concentration at matriculation.

**Key Points:**

Students will be covered on YSPH/EHS fellowships, if available, for the first two years. In years 3-5 student’s expenses will be covered either by the dissertation advisor or by individual fellowships (F31 or foundations).

Two research rotations are required during the first year (will require seminar presentation).

In the fall of the third year, students are expected to complete their thesis dissertation prospectus. Evaluation of the written prospectus, oral presentation and defense of the prospectus will constitute the qualifying exam.

The departmental seminars are modified to include journal club presentations.
**Course Requirements**

The Ph.D. degree in Environmental Health Sciences requires a minimum of 13 course units.

**1st Year of Study**

*Required courses*

<table>
<thead>
<tr>
<th>Environmental Epidemiology &amp; Exposure Science Concentration</th>
<th>Environmental &amp; Molecular Toxicology Concentration</th>
<th>Course Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIS 505a, Introduction to Statistical Thinking I</td>
<td>BIS 505a, Introduction to Statistical Thinking I</td>
<td>1</td>
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<tr>
<td>BIS 505b, Introduction to Statistical Thinking II</td>
<td>BIS 505b, Introduction to Statistical Thinking II</td>
<td>1</td>
</tr>
<tr>
<td><strong>CDE/EMD 508a, Principles of Epidemiology I</strong></td>
<td><strong>CDE/EMD 508a, Principles of Epidemiology I</strong></td>
<td>1</td>
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<tr>
<td>^EHS503a, Public Health Toxicology</td>
<td>^EHS503a, Public Health Toxicology</td>
<td>1</td>
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<tr>
<td>^EHS 510a, Principles of Environmental Health Sciences</td>
<td>^EHS 510a, Principles of Environmental Health Sciences</td>
<td>1</td>
</tr>
<tr>
<td>^EHS 525 a &amp; b, Seminar in Environmental Health</td>
<td>^EHS 525 a &amp; b, Seminar in Environmental Health</td>
<td>0</td>
</tr>
<tr>
<td>EPH 600b, Research Ethics and Responsibilities</td>
<td>EPH 600b, Research Ethics and Responsibilities</td>
<td>0</td>
</tr>
<tr>
<td><strong>EHS 608b, Frontiers of Public Health</strong></td>
<td><strong>EHS 608b, Frontiers of Public Health</strong></td>
<td>1</td>
</tr>
<tr>
<td>EHS 620a &amp; b Research rotation</td>
<td>EHS 620a &amp; b Research rotation</td>
<td>2</td>
</tr>
<tr>
<td>EHS 507a, Environmental Epidemiology</td>
<td>EHS 545b, Molecular Epidemiology</td>
<td>1</td>
</tr>
<tr>
<td>EHS 508b, Assessing Exposure Environmental Stressors</td>
<td>EHS (TBD), Developmental Origins of Health and Disease</td>
<td>1</td>
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</tbody>
</table>

**Students entering the doctoral program with an MPH degree are exempt from EPH 608b, Frontiers in Public Health. Students with prior graduate level epidemiology courses may be exempt from CDE 508a, Principles of Epidemiology I.**

^Additional readings required for Ph.D. students.
### 2nd Year of Study

<table>
<thead>
<tr>
<th>Environmental Epidemiology &amp; Exposure Science Concentration</th>
<th>Environmental &amp; Molecular Toxicology Concentration</th>
<th>Course Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students must choose a minimum of three electives (in consultation with his/her dissertation advisor) from the list below</td>
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<td>1</td>
</tr>
<tr>
<td>BIS 639b, Descriptive Analysis of Public Health Data</td>
<td>BIS 639b, Descriptive Analysis of Public Health Data</td>
<td>1</td>
</tr>
<tr>
<td>EHS 520b, Case-Based Learning for Genetic and Environment Interactions</td>
<td>EHS 520b, Case-Based Learning for Genetic and Environment Interactions</td>
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</tr>
<tr>
<td>BIS 623a, Applied Regression Analysis</td>
<td>EHS 508b, Assessing Exposure Environmental Stressors</td>
<td>1</td>
</tr>
<tr>
<td>BIS 625a, Categorical Data Analysis</td>
<td>EHS 537a, Water, Sanitation and Global Health</td>
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</tr>
<tr>
<td>BIS 628b, Longitudinal &amp; Multilevel Data Analysis</td>
<td>EHS/CDE 502b, Physiology for Public Health</td>
<td>1</td>
</tr>
<tr>
<td>CDE 617b, Developing a Research Proposal</td>
<td>CDE 617b, Developing a Research Proposal</td>
<td>1</td>
</tr>
<tr>
<td>EHS 580b, Environmental Hormones &amp; Human Health</td>
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</tr>
<tr>
<td>BIS 511a, GIS Applications in Epidemiology and Public Health</td>
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<td>1</td>
</tr>
<tr>
<td>EHS 545b, Molecular Epidemiology</td>
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<td>1</td>
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</tbody>
</table>

Electives are flexible and with guidance from the dissertation adviser may be tailored to the individual needs and career goals of a student.

### Advisory Committees

**Academic Advisor**

Each student is assigned an academic adviser (primary or secondary faculty member of EHS with Graduate School appointment) at the time of matriculation. The academic adviser is available for help with general academic questions, course selections and research rotations.

**Dissertation Advisor**

Although students and potential dissertation advisers are encouraged to discuss possibilities at any time, a final commitment must be made at the beginning of the second year and subsequent to the successful completion of the preliminary examination. The dissertation advisor must have an appointment in the Graduate School and should be a faculty member in EHS (primary or secondary).
Dissertation Advisory Committee

The Dissertation Advisory Committee (DAC) usually consists of three members and the dissertation advisor serves as the chair of the DAC. The student, together with the advisor, will choose other members from the faculty of YSPH or from outside YSPH. An additional committee member may be selected from outside the University, if she/he is a recognized authority in the area of the dissertation. The DAC is expected to meet at least twice each year, and more frequently if necessary. If vacancies occur or replacements are necessary, the committee will fill those taking into consideration the student/advisor recommendations.

PhD Requirements

In order to graduate, an EHS student must satisfactorily complete the requirements described in I through VIII below as well as adhere to all requirements of the Public Health program and the Graduate School of Arts and Sciences.

I. Coursework and General Requirements

A program of study with required core courses is designed to accommodate the student's long-range goals, possible undergraduate deficiencies, immediate research interests and the requirements of the Graduate School. A minimum of 13 course units is required for the degree.

II. Research Rotations

Two research rotations during the first academic year in EHS laboratories (primary and secondary faculty) are required for each student. The first rotation will be in the “fall semester” and the second in the “spring semester”. A third rotation will be offered, if necessary during the summer between the first and second year. Research rotations will be available for both “dry” (i.e., statistical analysis) and “wet” (i.e., bench) research groups. The student will meet with the EHS faculty member at the beginning of the rotation for an explanation of the goals and expectations of a student in the laboratory. The student will become familiar with the research models, approaches, and methods utilized by the research group through interactions with other laboratory/research personnel and from laboratory manuscripts. The student is expected to spend at least 15 hours per week working in the laboratory or research group and present a rotation seminar at the end of the rotation period.

Students are required to present a 30 minute seminar for each completed research rotation (two total). These seminars will be scheduled no later than 45 days following the completion of the rotation.

III. Seminars

All students enrolled in the program must present at least one research seminar per year. This will be either during the annual departmental retreat (summer), or at the YSPH doctoral program Research-in-Progress (RIP). Satisfactory seminar performance will be evaluated by the faculty in attendance. In addition to the research seminar, students are required to complete a seminar in the EHS journal club, which is part of the "Current Topics in EHS Research." The student and course coordinator will choose the subject of this seminar. The presentation should review a topic related to the EHS Seminar Speaker that will present the week after. Students are required to attend all seminars scheduled by the EHS Program and participate in the journal club.

IV. Preliminary Examination

A preliminary examination will take place in June following the first year of study. The examination covering materials from core classes will be in-class and consist of 5 questions. One
faculty member is responsible for coordinating this examination, and the examination content is
developed by the faculty of core classes. The exam can be retaken once after 3 months.

V. Qualifying Examination

A general oral and written qualifying examination, "separate from course examinations", must be
passed by the student as required by the Graduate School. The Qualifying Examination is normally
taken during the fall semester of a student’s third year, but should be completed before he or she
registers for the sixth semester. The student's dissertation advisory committee will administer this
qualifying examination. The exam consists of an evaluation of a written prospectus and an oral
presentation and defense of the research proposal. The proposal will be on the thesis project of the
student and it will in the format of the NRSA. Following completion of the written segment, the
student will present and defend the thesis proposal to the dissertation advisory committee within
two weeks after the completion of the written segment. The possible outcomes are (a) pass
unconditionally, (b) pass conditionally, with further study suggested (or required) in one or more
areas, or (c) fail, with or without the option to re-take the examination after the areas of concern
have been pointed out and the student has had time to prepare. If a student receives an
unconditional pass, the committee should note whether it is an unconditional pass with distinction
or not.

Once the student has passed the qualifying examination without conditions, and the Graduate
Studies Executive Committee has approved the prospectus the student will be admitted to
candidacy.

VI. Thesis Progress

A thesis progress report must be submitted to the dissertation advisory committee twice a year.
The report should reflect the work accomplished and provide a reasonable indication that the thesis
will be completed in the expected time frame. Once the progress report is submitted, the committee
will meet with the student to discuss the status of the work and to evaluate the student's
understanding of the research area. This will allow the committee to reach consensus on what
experimental work will be required before writing of the dissertation can commence. The
Chairperson of the DAC produces a summary evaluation of progress and plans for the coming
year. This document is to be distributed to each committee member for comments and signature.
The student and the DGS are to receive a copy of the signed document from the DAC Chairperson.

Two annual dissertation advisory committee meetings must be completed by June 30 of each
academic year. Since Dissertation Progress Reports at the Graduate School are due at the close of
the spring term, it is advised that one meeting is scheduled during this term.

VII. Thesis Research

All PhD candidates will be required to satisfactorily complete a research thesis. This work should
be of sufficient scope and quality to result in a significant contribution to the literature. A final
copy of the thesis must be submitted to the student’s dissertation advisory committee at least two
weeks prior to the final presentation.

VIII. Thesis Defense

After the thesis has been received, the dissertation advisory committee will conduct a final
examination of the thesis and decide whether the thesis work is recommended for public defense.