ENVIRONMENTAL HEALTH, PHD

PhD in Environmental Health

Students in the PhD program pursue one of the following tracks:

Environmental Sustainability, Resilience, and Health

The Environmental Sustainability, Resilience and Health (ESRH) track aims to cultivate innovative public health scientists and engineers who address urgent challenges at the intersection of climate, sustainability, resilience, and equity. Students in the track will work with anthropogenic and other factors that exacerbate ecological crises, and interventions aimed at adapting to threats and minimizing the diverse impacts on human health, with emphasis on equity. Additionally, students will focus on how global environmental changes affect human societies, infrastructure, and ecosystems, as well as strategies for adapting to evolving public health threats.


The track in Exposure Sciences and Environmental Epidemiology offers research and training opportunities in key topic areas relevant to environmental and occupational health. These areas include air, water, the food system, early life exposures, metals and synthetic chemicals, environmental microbiology, the built environment, global environmental health, molecular and integrated epidemiology, and the investigation of susceptibility factors and effective interventions.


The track in Health Security focuses on research and training in a wide, complementary range of topics aimed to reduce health security threats and their impacts, and to increase community resilience to global catastrophic biological risks. Students in this track will focus on identifying major health security risks, applying risk assessment principles to address health security risks, identifying and assessing current initiatives to improve health security, evaluating the effectiveness of health security strategies, and communicating information to inform policy.


Basic research in this track is focused on discovering novel molecular mechanisms that drive the pathophysiology of major chronic diseases to develop prevention and therapeutic strategies to improve public health. Students in this track will engage in academic training in specific areas of environmental health with in-depth courses in molecular, toxicologic, physiologic, immunologic, and pathophysiologic sciences.

PhD Requirements

The following information regarding doctoral requirements serves as a general guide to Departmental policies and procedures and is subject to change.

Core Coursework

Course location and modality is found on the JHSPH website (https://www.jhsph.edu/courses/).

The School and the Department have specified a series of required core courses to be completed by all PhD students. PhD students are required to complete at least 64 credits of formal coursework (i.e., not special studies). At least 18 credits of formal coursework are required in courses outside the student’s primary department. At least nine of these credits must be taken in the School of Public Health.

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<tbody>
<tr>
<td>PH.550.600</td>
<td>Living Science Ethics - Responsible Conduct of Research</td>
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<tr>
<td>PH.180.661</td>
<td>Writing Scientific Papers I</td>
<td>2</td>
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<tr>
<td>PH.180.662</td>
<td>Writing Scientific Papers II</td>
<td>2</td>
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<td>Grant Writing I</td>
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<td>Grant Writing I</td>
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<tr>
<td>EN.570.616</td>
<td>Data Analytics in Environmental Health and Engineering</td>
<td>3</td>
</tr>
<tr>
<td>PH.180.860</td>
<td>EHE Student Seminar &amp; Grand Rounds</td>
<td>1</td>
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<tr>
<td>PH.180.840</td>
<td>EHE Doctoral Special Studies and Research</td>
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Note: The School’s Satisfactory Academic Performance policy requires doctoral students to maintain a minimum GPA of 3.0 and to have a B or greater in program core courses. Please refer to the following track-specific sections for additional course requirements.

Track-Specific Coursework

Environmental Sustainability, Resilience, and Health

Basic research in this track is focused on discovering novel molecular mechanisms that drive the pathophysiology of major chronic diseases to develop prevention and therapeutic strategies to improve public health. Students in this track will engage in academic training in specific areas of environmental health with in-depth courses in molecular, toxicologic, physiologic, immunologic, and pathophysiologic sciences.

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<tr>
<td>PH.180.620</td>
<td>Introduction to Food Systems and Public Health</td>
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<tr>
<td>PH.188.682</td>
<td>A Built Environment for A Healthy and Sustainable Future</td>
<td>3</td>
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<tr>
<td>EN.570.607</td>
<td>Energy Policy and Planning Models</td>
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At least 9 credits in chosen topic area

Climate Change
Recommended Courses in Diversity, Equity, and Inclusion

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<td>Community-Driven Epidemiology and Environmental Justice</td>
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<tr>
<td>PH.180.626</td>
<td>Environmental Justice and Public Health Practice</td>
<td>3</td>
</tr>
<tr>
<td>PH.180.621</td>
<td>Protecting the Environment and Safeguarding Worker Health: A Problem-Based Approach</td>
<td>3</td>
</tr>
<tr>
<td>PH.180.602</td>
<td>Environment and Health in Low and Middle Income Countries</td>
<td>2</td>
</tr>
<tr>
<td>PH.410.606</td>
<td>Local and Global Best Practices in Health Equity Research Methods</td>
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Exposure Sciences and Environmental Epidemiology

Students receiving funding from the NIOSH Education and Research Center (ERC) may be required to complete additional coursework. Contact your adviser for more information.

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<tr>
<td>PH.182.613</td>
<td>Exposure Assessment Techniques for Health Risk Management</td>
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<td>PH.182.617</td>
<td>Exposure Sciences for Health Risk Assessment</td>
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</tr>
<tr>
<td>PH.340.680</td>
<td>Environmental and Occupational Epidemiology</td>
<td>4</td>
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<tr>
<td>PH.185.801</td>
<td>Exposure Sciences &amp; Environmental Epi Journal Club</td>
<td>1</td>
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Biostatistics:

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<td>Statistical Methods in Public Health I</td>
<td>4</td>
</tr>
<tr>
<td>PH.140.622</td>
<td>Statistical Methods in Public Health II</td>
<td>4</td>
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<tr>
<td>PH.140.623</td>
<td>Statistical Methods in Public Health III</td>
<td>4</td>
</tr>
<tr>
<td>PH.140.624</td>
<td>Statistical Methods in Public Health IV</td>
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Epidemiology:

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<td>PH.340.751</td>
<td>Epidemiologic Methods 1</td>
<td>5</td>
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<td>PH.340.752</td>
<td>Epidemiologic Methods 2</td>
<td>5</td>
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<tr>
<td>PH.340.753</td>
<td>Epidemiologic Methods 3</td>
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Cells to Society:

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<tr>
<td>PH.552.601</td>
<td>Foundational Principles of Public Health</td>
<td>0.5</td>
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<tr>
<td>PH.552.603</td>
<td>The Role of Qualitative Methods and Science in Describing and Assessing a Population’s Health</td>
<td>0.5</td>
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<tr>
<td>PH.552.609</td>
<td>Psychological and Behavioral Factors That Affect A Population’s Health</td>
<td>0.5</td>
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<tr>
<td>PH.552.610</td>
<td>The Social Determinants of Health</td>
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<td>PH.552.611</td>
<td>Globalization and Population Health</td>
<td>0.5</td>
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<tr>
<td>PH.552.612</td>
<td>Essentials of One Health</td>
<td>0.5</td>
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Health Security

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<td>PH.140.624</td>
<td>Statistical Methods in Public Health IV</td>
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<td>PH.552.601</td>
<td>Foundational Principles of Public Health</td>
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<tr>
<td>PH.180.634</td>
<td>Public Health Emergencies: Risk Communication and Decision Science</td>
<td>3</td>
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<tr>
<td>PH.180.670</td>
<td>Introduction to Public Health Emergency Preparedness</td>
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another course that has been approved by the track directors. A grade
complete the core course by repeating the same course or by completing
requirement must, at the next opportunity, make a second attempt to
who earns a grade below that threshold in a course that meets a core

Grade and GPA Requirements

Doctoral students must earn a minimum grade on a set of required
program-specific core courses: “Pass” for courses offered only on a pass/
fail basis; “B” or higher for courses offered for letter grading. A student
who earns a grade below that threshold in a course that meets a core
requirement must, at the next opportunity, make a second attempt to
complete the core course by repeating the same course or by completing
another course that has been approved by the track directors. A grade
below the threshold on the second attempt may be grounds for dismissal
and must be reported to the School’s Committee on Academic Standards.

The School requires doctoral students to maintain a minimum 3.0
cumulative GPA. Students with a GPA falling below 3.0 will be placed on
academic warning and will have one term of registration in which to raise
their GPA above the threshold for their degree.

Teaching Assistant Requirement

Teaching assistant positions provide students with an opportunity to
develop their teaching and interpersonal skills, to work professionally
with faculty and fellow students, and to contribute service to the
Department. All PhD students are required to serve as TA for one course
each year during their second, third and fourth year of the program. Only
EHE courses may be used to fulfill this requirement and students must
be enrolled in courses on a full-time basis. The academic coordinator
maintains a list of EHE courses that are approved to fulfill the TA
requirement. Students must receive approval from their adviser prior to
accepting a TA position. Students are required to complete the online TA
training during their first year in the program. The academic coordinator
will verify the student has completed the training prior to starting a TA
position.

A student will become eligible for compensation once they have satisfied
the yearly TA requirement.

Individual Development Plan

The University Doctoral Board requires that each doctoral student will
be reviewed annually during each year of their doctoral program. This
requirement is also in line with a 2014 National Institute of Health notice
strongly encouraging the development of an institutional policy on
Individual Development Plans (IDPs) for all graduate students supported
by NIH funds. The IDP addresses two needs. First, it provides a structure
to systematically identify training needs and competencies, establish
goals and take stock of year-by-year progress. Thus, IDPs help doctoral
students stay on track with their research as well as paper and grant
writing and skills development. Second, there are many career options
for individuals who have obtained a PhD in Environmental Health. The
IDP helps doctoral students plan and prepare for their post-PhD future. In
both areas, IDPs can serve as a tool to facilitate communication between
trainees and their mentors.

Goals and benefits

An annual IDP as part of a broader mentoring program will give the
trainee a framework for self-assessment, planning, and communication:

- Assessing current skills, interests, and strengths and their progress in
  the program;
- Establishing target dates for academic and research milestones;
- Developing a plan for skill development to meet academic and
  professional goals;
- Set goals and sub-goals for the next year, including how to spend
  their time;
- Defining in detail the approach they plan to take in order to obtain
  the specific skills and strengths needed (e.g. courses, technical
  skills, teaching, supervision) along with an anticipated time frame for
  obtaining those skills and strengths;
- Helping define career goals and create annual plans to reach goals;
- Providing a tool that can be used to provide structure for
  conversations between the student and their mentor;
• Communicating and collaborating with colleagues and potential employers about evolving goals and related skills;
• Using the IDP to make sure student and adviser expectations are clearly outlined and in agreement so that there are no big surprises, particularly towards the end of doctoral training;
• The IDP is meant as a living document, to be modified as the student moves through the program to help solidify goals and plans.

Students are encouraged to take advantage of this opportunity to reflect on their success and challenges from the previous year and work towards key milestones and anticipate challenges in the coming year(s). They are encouraged to use the questions in the IDP as a starting place for thinking; they should not feel the need to respond to all questions, if some are less relevant for the individual, and the student should feel free to also consider addressing other aspects not included in the structured IDP questions.

**IDP AND ANNUAL REVIEW COMPONENTS**
The annual review will have three components:

1. Student self-assessment and IDP
2. Monitoring of progress in the program
3. Written feedback from the department to the student.

**STUDENT SELF-ASSESSMENT AND IDP**
At the start of each academic year students will complete or update the self-assessment and IDP. They will meet with their adviser in person to discuss the IDP no later than the end of fall semester/2nd term. If insufficient progress is being made (e.g. failing grades, inadequate progress), the student may be placed on probation prior to the start of the spring semester/3rd term.

Students in the second year and beyond will document their accomplishments from the past year and note specifically any accomplishment(s) and activities not presently reported (i.e. papers in review/published, posters presented, presentations or guest lectures given, and/or grant proposals in progress, submitted or funded). Students should note if they had any teaching assistant (TA) duties.

Students should include short- and long-term research/academic/professional goals, for the next year and beyond, how their progress in the past year has contributed to those goals, how their planned activities in the next year will contribute to their longer-term goals, and any impediments they see to reaching those goals.

Students should note issues that could impede their progress in the program or in terms of their broader professional goals. Students should also identify and discuss new activities and opportunities that could assist them in achieving their goals.

**MONITORING STUDENT PROGRESS IN THE PROGRAM**
If the student has not completed their qualifying written and oral exams, then the student will schedule an in-person meeting with their adviser and another faculty member, if desired (e.g. co-adviser or track director), to review the IDP. If the student has completed their qualifying written and oral exams, then this meeting will be done in conjunction with a thesis advisory committee meeting. There should be mention of a timeline for meeting program goals and degree completion; and any concern regarding performance. Funding, research changes, TA expectations, etc. should be confirmed and clarified as well. Concerns, questions and needed clarifications should be addressed in this meeting. If there are irreconcilable concerns between the student and adviser, the track directors should be consulted with next steps potentially engaging the Departmental chair in the discussions. After the meeting, the student will write a brief summary of their goals and plans for the next year and sends it to their adviser for their comments and feedback. The completed form is then emailed to the academic coordinator as documentation that the IDP was completed and discussed between student and adviser. Students who have successfully passed the School-wide preliminary oral exam will meet with their thesis advisory committee every six months until program completion. A report of each meeting will be documented on Form C- Thesis Advisory Committee Meeting Evaluation and submitted to the academic coordinator to be included in the students file.

**DEPARTMENTAL FEEDBACK TO THE STUDENT**
Each year the Department will provide written feedback to the student. Feedback will be in the form of a letter detailing the student’s progress and deficiencies, evidence of completion of the IDP process and discussion, and summary of specific goals and expectations for the next year.

**REPORTING AND RECORDS**
The Department is responsible for initiating the IDP/annual review process and ensuring its completion even if a student or adviser does not comply or engage in the process. If a student does not respond to requests to participate in the annual review process, a note will be placed with the Department’s tracking system citing that the student did not comply. Non-compliance will result in probation. In the event the adviser is unable or unwilling to complete the annual review process the department will select another faculty member to complete the review. The Department chair will discuss the implications of non-compliance of faculty mentors with the IDP process.

**Milestones**

**Written Comprehensive Examination**
A written comprehensive exam is required of all doctoral students. The examination will be taken upon completion of the EHE-required PhD core courses and a substantial proportion of the track-required courses. The track directors will send written notification of the successful completion of the examination to the academic coordinator. If a student fails the examination they can be terminated from the program. Track directors will decide if a student will be permitted to re-take the exam, and if so, whether they will be examined on a particularly weak area or be required to take another complete exam comprised of new questions. Only one reexamination may be permitted. Failing the reexamination will result in termination from the program. Doctoral students who are not able to continue in the program may request a transfer to the MHS or ScM.

**Research Proposal**
All PhD students are required to develop a written proposal to prepare for the preliminary oral examinations. The proposal will be in the form of a standard NIH or other funding agency format. In general, the grant proposal will be drafted as a component of the Writing Scientific Papers and Grant Writing courses. It is the responsibility of the adviser to inform the student if there are any track-specific deviations from this requirement.

**Departmental Practice Oral Evaluation**
In preparation for taking the School-wide preliminary oral examination, all PhD students of the Department of Environmental Health and Engineering are required to achieve satisfactory performance on a Departmental practice oral evaluation. This evaluation provides an opportunity for the student to demonstrate the effective verbal communication skills and the ability to engage in scientific exchange...
that will be tested on the official formal School-wide preliminary oral examination.

The evaluating committee will consist of five faculty members with primary or joint appointments in EHE: four from the student’s track (including the adviser) and one from within the Department but outside the student’s track. The most senior faculty member (excluding the student’s adviser) will serve as the chair of the evaluation process. Students should work with their adviser to select the faculty composition and exam time and complete the Departmental oral evaluation form.

School-wide Preliminary Oral Examination
The School-wide preliminary oral examination (POE), administered by the School’s Office of Academic Affairs under University guidelines, determines whether the student has the ability, depth, breadth, and knowledge to undertake significant doctoral-level research in their specialized area of interest. The examination should be taken at the earliest feasible time, no later than the end of the student’s third year in residence, and before significant engagement in dissertation research.

The School provides guidance for conduct of the preliminary oral exam for PhD students (https://my.jhsphs.org/StudentDocuments/JHSPH-PhDPrePreliminaryOralExam-Guidance-28July2018.pdf). The student and their adviser are responsible for initiating arrangements for this examination. Requests for scheduling the exam must be sent to the School's Office of Records and Registration at least one month prior to the examination; therefore, the form must be submitted in advance of this time to the academic coordinator. All members of the committee must be present at the scheduled exam location. If the student fails the preliminary oral examination and is permitted a re-examination, they must be re-examined within one year.

Thesis Advisory Committee
Upon successful completion of the preliminary oral examination, a thesis advisory committee will be formed to provide continuity in the evaluation of progress and development of the student. The principal responsibilities of the committee are to review the student’s dissertation proposal, to advise and guide the student’s research, and to read and evaluate the student’s final dissertation. Students work in consultation with their adviser and/or track directors to select members of the committee. The committee consists of the student’s adviser and two to four other faculty members from both inside and/or outside the student’s Department with expertise in areas relating to the proposed research of the student. Membership of the committee may change as dictated by the needs of the student and direction of the research.

It is required that the student will meet formally at least twice per year (every six months) with the committee, beginning six months after the successful completion of the school-wide preliminary oral examination and continuously until the final defense. At these meetings, the student will present progress on their thesis project and the committee will offer advice. For each meeting, an evaluation (completed Form C - Thesis Advisory Committee) of the student’s development and progress will be prepared by the adviser in consultation with the committee, discussed with the student, and submitted to the academic program administrator to be included in the student’s file. As the thesis project progresses, the committee may indicate a target date for completion of the thesis research. Noncompliance with committee meeting requirements is grounds for dismissal from the program.

Final Oral Defense and Public Seminar
The committee of thesis readers shall conduct the oral defense of the thesis after the thesis advisory committee agrees that the candidate is ready for the formal defense (also known as final oral exam or FOE). During this defense the committee shall evaluate:

I. The originality and publication potential of the research;
II. The candidate’s understanding of the details of the methodologic and analytic work;
III. The final quality of the written thesis document.

The final oral examination is a defense of the thesis before a committee of at least four readers. Guidance on committee composition can be found on the doctoral candidate information page. Once a date for the defense has been agreed upon by the committee of thesis readers, a formal request for the final oral defense should be submitted to the Office of Records and Registration at least one month prior to the exam date. This should be submitted in advance of the one-month period to the academic coordinator for processing. The adviser will confirm that the thesis is in a final form, is ready to be submitted to the readers, and that all other School and Department requirements for the degree have been fulfilled. Readers must have at least one month to read the thesis before the final examination is held as they might have suggested revisions as well. All doctoral candidates are required to give a formal presentation of their completed thesis work at a public seminar.

Doctoral students will have up to 30 days after the final defense to make corrections and submit their electronic dissertation. All doctoral students must remain registered during this time. If the funding has not gone over the total number of years allotted, they will receive stipend and health insurance coverage for these 30 days. After the 30 days, they will be terminated from payroll as a graduate student in the Department. Students on the School health plan are responsible for cancelling their insurance and should contact Student Accounts.

The Department requires one bound copy of the dissertation. The School recommends using Thesis on Demand. The binding should be black with the students name, degree, and year on the spine; dissertation title and name on the front. The Department does not cover the cost of electronic thesis submission or binding. All Departmental copies are placed in an accessible Departmental archive.

PhD Program Policies
Time to Completion
PhD students have seven years from the time of matriculation to complete their degree requirements. However, it is expected that all doctoral students will have completed the program within five years after matriculation. Students will receive a maximum of five years of funding from the program, dependent on continued satisfactory progress. Student funding beyond five years is not available. A formally approved leave of absence does not count toward this time.

Faculty Advisers
PhD students are assigned a faculty adviser once they are admitted to the program. The adviser serves as the primary contact for the Department and will assist the student with course selection each term, planning research rotations if appropriate, preparation of journal club and seminar presentations, and the interpretation of Departmental and School policies. This initial, or academic, adviser may or may not become the student’s research adviser. As early as the first year, a thesis research adviser is selected to serve as the student’s adviser for the conduct of their research. This selection, however, does not exclude significant interactions with other members of the faculty. The faculty adviser
must approve student registration and course plans (as applicable). At the end of each academic year, the adviser and the student must review academic progress and determine plans that will keep the student on track toward graduation. This information is also reviewed by the student’s doctoral track director(s) and the academic coordinator. If the student wants to change advisers, they must discuss the reasons with their track director(s) and submit a request to the academic program administrator. Such changes are considered upon mutual agreement and availability of an appropriate adviser. Changes will be noted on the students’ transcript.

**Doctoral Registration**

In addition to the School’s residency requirement, full-time doctoral students in the Department must register on a continuous basis for a minimum of 16-credits each academic term. Registration is not required during the summer* or interim sessions and tuition funding is typically not provided for these terms. All students are required to discuss course registration with their adviser prior to the start of each term. Full-time students who fail to register by the published deadlines during a regular academic term will incur a late registration fee from the School that must be paid by the student. If a student still does not register after the add/drop deadline for the term, they will be considered withdrawn by the School and the Department. Note: Some students will be registered by the Department during the summer term for administrative purposes; however, this registration does not imply that didactic courses will be funded.

**Assessment of Progress**

In order to monitor and document adequate academic performance and progress, a review of the doctoral student’s grades and activities is carried out continually. This information is reviewed by the adviser, the doctoral track directors and the academic coordinator. In addition to maintaining satisfactory academic progress and being in good standing with departmental standards, each student must successfully complete a comprehensive written examination, departmental practice oral evaluation, and the school-wide preliminary oral examination. Failure to successfully complete any of these requirements will be grounds for dismissal from the program.

**Seminars and Retreat**

In addition to attendance at formal courses, students are required to attend Departmental and program seminars and track journal club. Students are also required to attend the EHE Grand Rounds in which Hopkins faculty, scientists from other institutions, and alumni are invited to present cutting-edge research findings. In addition, students will attend and present (once per year in years 2-4) their ongoing research at the EHE Student Seminar series and attend the annual Departmental research retreat.

**Attendance**

Students are required to attend all classes, including journal clubs and seminars, and actively participate. Scheduling conflicts that arise must be discussed with the student’s adviser. Since research and practice are fundamental parts of the curriculum, it is required that students will work (with the approval of their adviser) in the laboratory, or pursue other research, including participation in public health practice opportunities during term breaks. Non-compliance with attendance is grounds for probation or dismissal from the program.

**Vacation**

Students will take no more than two weeks’ vacation per academic year (University holidays are approved time off and are not included in the two weeks’ vacation). Students must discuss all plans for vacation or other absences with their adviser. Non-compliance with vacation is grounds for probation or dismissal from the program.

**Learning Outcomes**

**Training Competencies**

The goal of PhD training in EHE is to, through core and track-specific courses, research rotations, qualifying examinations, and mentored research, prepare graduates to be independent investigators who engage in scholarship that creates new knowledge, use research to transform practice and improve environmental health, and effectively communicate research findings.

We expect graduates of the PhD program to be able to:

1. Describe all aspects of the environmental health paradigm (from sources to health effects) for a range of agents and stressors and scales from local to global
2. Identify common environmental health hazards and risks
3. Understand the interdisciplinary nature of environmental health research
4. Explain core epidemiological concepts
5. Explain the role of law, policy, and regulations in environmental health protection
6. Explain concepts of risk assessment and management to assess and control environmental health risks
7. Utilize statistical techniques to support research designs and perform data analyses
8. Write and critique a grant proposal in the NIH format
9. Evaluate and critique a body of literature in order to assess the state of knowledge and research gaps
10. Develop a specialized area of knowledge within one of the Department’s academic tracks
11. Develop a set of research tools and skills needed to conduct independent research
12. Develop, conduct, and defend original research that is worthy of publication and leads to a completed thesis
13. Communicate research results to technical and lay audiences
14. Translate research findings into practice

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6 Environmental Health, PhD