

ENVIRONMENTAL HEALTH, SCM

ScM in Environmental Health

The Master of Science (ScM) in Environmental Health (<https://publichealth.jhu.edu/academics/scm-in-environmental-health/>) is intended for individuals with a strong interest in pursuing research in one of the various areas within environmental health. Typically, students have prior hands-on experience in laboratory, field or population-based investigations that they would like to build upon. ScM students write a thesis that is based on original research carried out by the student under the direction of a faculty advisor.

Graduates of the program are well-prepared to transition directly into opportunities for further training and research through doctoral degree programs in their primary areas of interest. For those wishing to apply their knowledge and research skills in the field of environmental health prior to pursuing advanced degrees, the ScM will position graduates to compete for research positions in the private sector, federal agencies and non-governmental organizations.

Program Director:
Megan Latshaw, PhD, MHS

Program Requirements

Coursework

Each term, students should register for at least 16 credits in order to reach the 64-credit requirement. Students reach this 16-credit-per-term minimum by first registering for the required courses, then choosing among the elective courses. Please refer to the course directory (<https://www.jhsph.edu/courses/>) for the most current course information. Students should consult their adviser about options for meeting the biostatistics and epidemiology course requirements.

After completing fourth-term coursework and successfully passing the comprehensive exam, the student begins a year-long research project under the direction of their adviser. During the second year, full-time enrollment must be maintained by taking a minimum of 16 credits of PH.183.825 EHE ScM Thesis Research in each of the four terms. Students are required to participate in all journal clubs, seminars, and meetings deemed necessary by the faculty research adviser. Students will be expected to complete the program at the end of the fourth term of their second year.

Students must successfully complete 64 credits of coursework and successfully passed the comprehensive exam to be considered for the Master's Tuition Scholarship (MTS) (<https://publichealth.jhu.edu/offices-and-services/office-of-admissions-services/funding-and-scholarships/>) in the second year. Students must meet all curriculum, grade, GPA, and registration requirements.

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

Required Courses

Code	Title	Credits
PH.550.860	Academic & Research Ethics at BSPH	0
PH.180.609	Principles of Environmental Health	4
PH.180.610	Applied Environmental Health Practice	4

PH.187.610	Public Health Toxicology	4
PH.317.600	Introduction to the Risk Sciences and Public Policy	4
PH.552.601	Foundational Principles of Public Health	0.5
PH.552.603	The Role of Qualitative Methods and Science in Describing and Assessing a Population's Health	0.5
PH.183.840	EHE Scm Special Studies and Research	1 - 22
PH.183.825	EHE ScM Thesis Research	1 - 22

Journal Club (select one):

PH.185.805 Toxicology, Physiology & Molecular Mechanisms Journal Club & Seminar

or PH.185.806 Advanced Concepts in Toxicology, Physiology & Molecular Mechanisms

PH.185.801 Exposure Sciences & Environmental Epi Journal Club

Biostatistics varies

Epidemiology varies

Electives

Code	Title	Credits
PH.180.611	The Global Environment, Climate Change, and Public Health	4
PH.180.634	Public Health Emergencies: Risk Communication and Decision Science	3
PH.188.680	Fundamentals of Occupational Health	3
PH.188.694	Health of Vulnerable Worker Populations	3
PH.317.610	Risk Policy, Management and Communication	3
PH.180.620	Introduction to Food Systems and Public Health	4
PH.180.621	Protecting the Environment and Safeguarding Worker Health: A Problem-Based Approach	3
PH.120.601	Biochemistry II: Major Metabolic Pathways	5
PH.180.647	The Health Effects of Indoor and Outdoor Air Pollution	3
PH.180.644	Food System Resilience	2
PH.187.632	Molecular Toxicology	4
PH.188.688	Global Sustainability & Health Seminar	1
PH.183.631	Fundamentals of Human Physiology	4
PH.187.640	Toxicology 21: Scientific Foundations	1
PH.180.650	Fundamentals of Clinical Oncology for Public Health Practitioners	3
PH.180.602	Environment and Health in Low and Middle income Countries	2
PH.180.623	Infectious Disease Threats to Global Health Security	3
PH.180.624	Biotechnology and Health Security	3
PH.182.640	Food- and Water- Borne Diseases	3
PH.180.655	Baltimore Food Systems: A Case Study of Urban Food Environments	4
PH.180.625	Community-Driven Epidemiology and Environmental Justice	3
PH.180.651	Energy, Environment, and Public Health	2
PH.182.626	Issues for Water and Sanitation in Tropical Environmental Health	2

PH.180.640	Molecular Epidemiology and Biomarkers in Public Health	4
PH.182.637	Noise and Other Physical Agents in the Environment	4
PH.317.605	Methods in Quantitative Risk Assessment	4
PH.182.613	Exposure Assessment Techniques for Health Risk Management	3
PH.183.638	Mechanisms of Cardiopulmonary Control	2
PH.340.607	Introduction to Cardiovascular Disease Epidemiology	4
PH.340.701	Epidemiologic Applications of Gis	2
PH.187.645	Toxicology 21: Scientific Applications	3
EN.575.711	Climate Change and Global Environmental Sustainability	3
PH.317.610	Risk Policy, Management and Communication	3
PH.180.606	Case Studies in Food Production and Public Health	4
PH.180.653	Climate Change: Avoiding Conflict and Improving Public Health	3
PH.188.682	A Built Environment for A Healthy and Sustainable Future	3
PH.180.628	Introduction To Environmental and Occupational Health Law	4
PH.182.638	Environmental and Health Concerns in Water Use and Reuse	4
PH.187.625	Animals in Research: Law, Policy, and Humane Sciences	3
PH.180.627	Lessons Learned in 1918 Pandemic Flu	1
PH.180.630	Chemical and Biological Weapons Threats: Science, Public Health, Policy	3
PH.180.633	The Sociocultural Dimensions of Disasters	3
PH.180.636	Human Rights and Health Seminar	3
PH.185.600	One Health Tools to Promote and Evaluate Healthy and Sustainable Communities	3
PH.180.670	Introduction to Public Health Emergency Preparedness	3
PH.317.615	Topics in Risk Assessment	2
PH.120.604	Introduction to Molecular Biology	3
PH.120.610	Biochemistry I: Protein Structure and Enzyme Catalysis	3
PH.180.632	Introduction to Molecular Toxicology	3
PH.187.661	Environmental Health in Neurological and Mental Disorders	3
PH.187.650	Alternative Methods in Animal Testing	3
PH.187.655	Evidence-Based Toxicology	3
PH.183.642	The Cardiopulmonary System Under Stress	2
PH.340.651	Emerging Infections	2
PH.340.680	Environmental and Occupational Epidemiology	4

Research Proposal

During the first year of the program, ScM students draft a proposal for their research project. The product, formatted similarly to an NIH R21 or F32 research proposal, includes an in-depth review of the literature and presents the key components of the research plan. Students will enroll in PH.183.840 EHE Scm Special Studies and Research which allows the

adviser to evaluate the student's progress in completing the proposal. Further guidance is provided at the start of the academic year.

Comprehensive Examination

Upon completion of first-year coursework, ScM students complete the comprehensive examination. The comprehensive examination requires the student to demonstrate their knowledge of the proposed research—its rationale, approaches, and methodologies—as well as its relevance and potential contributions within the broader perspective of environmental health. The research proposal serves as the written basis for the comprehensive examination. Students must pass the comprehensive examination prior to beginning the research year of the program to be eligible for the second year Master's Tuition Scholarship (MTS) (<https://publichealth.jhu.edu/offices-and-services/office-of-admissions-services/funding-and-scholarships/>).

Thesis and Presentation

The ScM degree requires successful completion of a research project and the writing of a master's thesis based on that work. The research will be completed under the direction of a faculty mentor (research adviser) who is a member of the Department of Environmental Health and Engineering. The work must represent an original hypothesis-driven investigation on a topic of interest to the student and agreed upon by the adviser. The format will adhere to University guidelines which can be found on the Johns Hopkins Sheridan Libraries website (<https://www.library.jhu.edu/library-services/electronic-theses-dissertations/>). The document quality must be suitable for publication in a peer-reviewed scientific journal.

Students are required to present their research during the MHS & ScM student presentation days in May. Presentations should be 10 minutes in length followed by 5 minutes of questions and answers from faculty and students.

ScM Policies

For complete policies and procedures, please view our handbook (<https://publichealth.jhu.edu/departments/environmental-health-and-engineering/programs/graduate-programs/graduate-student-resources/>).

Advisers

All master's students will be assigned an adviser who serves as the primary contact for the Department, assists the student with course selection each term, approves their essay or thesis, and helps interpret Departmental and School policies. The student is free to change advisers, but this change must be approved by the program director and sent to the academic coordinator via email. For students in the ScM, initially-assigned advisers may change when a student transitions from the MHS to the ScM program at the end of term 2 in the first year of the program.

Assessment of Progress

Students must meet minimum academic standards to remain in the master's program. Each term the student should review grades from the previous term with their adviser. Specific goals will be determined following this review. A student who is experiencing academic difficulty will be notified in writing if they are expected to achieve a specific GPA during the upcoming term. Failure to meet any of the following criteria is grounds for dismissal from the program.

Cumulative GPA

The School requires master's students to maintain a minimum 2.75 cumulative grade point average. Students with a GPA falling below 2.75 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. The academic coordinator will notify students placed on academic warning and their performance will be reviewed by the Educational Programs Committee (EPC). All recommendations about academic standing will be then presented to the Department's Executive Committee for final disposition. Students not meeting the minimum GPA after one term may be granted additional term(s) on academic warning if academic progress has been shown in the cumulative GPA; that approval beyond one term must be reported to the School's Committee on Academic Standards. Students on academic warning must meet with their academic adviser and program director (or academic coordinator) each term to review their academic plan and receive approval for their course schedule prior to registering for courses. Students with a cumulative GPA below the minimum may not register for more than 18 credits per term. Any repeated courses count towards this 18-credit limit.

Grades in Core Courses

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 and "C" or higher for master's students' 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 program director. 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.

Department Retreat

Each January, the EHE faculty and students attend a retreat that includes faculty presentations and student posters on research currently being conducted in the department. The retreat ends with a keynote talk from an investigator outside of EHE. The retreat provides both ScM and MHS students with the chance to meet faculty and students and learn more about research being conducted in the department. Attending the retreat, including talks and poster sessions, is expected for ScM students and optional for MHS students.

According to the requirements of the Council on Education for Public Health (CEPH), all BSPH degree students must be grounded in foundational public health knowledge. Please view the list of specific CEPH requirements by degree type (<https://e-catalogue.jhu.edu/public-health/ceph-requirements/>).

Students in the ScM program can expect to obtain the following learning objectives upon completing the program:

1. Examine the nature and interactions of the key disciplines that form the foundation of environmental health and their ethical application to environmental health issues.
2. Illustrate how environmental health fits within the larger context of public health problems, interventions and practice.
3. Use problem-solving approaches and tools to identify and address environmental problems related to toxicant exposures.
4. Interpret and critically evaluate the environmental health literature relevant to research on toxicologic mechanisms of adverse human health effects.
5. Effectively communicate the nature and significance of environmental health problems, as well as their solutions, to expert and lay audiences.

6. Utilize statistical techniques to support research designs and perform data analyses.
7. Design and conduct ethical studies to gain knowledge of the adverse human health effects of environmental agents and conditions.
8. Conduct independent research to address occupational and environmental (including the natural, built, and social environments) health challenges at regional, national, and international levels.
9. Effectively present research results in a formal oral presentation and in a written format appropriate for publication in a scientific journal.