

# 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 adviser, which is found by the student in their first year.

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 Requirements

The two-year ScM degree provides an opportunity to do a year-long research project with a faculty member. ScM students are responsible for identifying a faculty member who matches their research interest and is willing to take them on in the second year of the program. It is recommended that students find a faculty member (<https://publichealth.jhu.edu/academics/scm-in-environmental-health/scm-faculty-advisers/>) before arriving or as late as the end of their first term. The first year of the program follows the full-time MHS curriculum and focuses on coursework designed to provide a strong foundation in environmental health. Instead of writing an essay, first-year ScM students write a research proposal. Like the MHS program, ScM students may or may not choose an area of interest.

For all ScM students, their research project must represent original work. Their first-year product resembles a NIH R21 or F31 research proposal, including an in-depth review of the literature. The page limit for the specific aims is 1 page and for the research strategy is 6 pages (references not included in the page limit). The proposal fulfills the written portion of the ScM comprehensive exam degree requirements.

## Coursework

Students complete a core curriculum that comprises less than 40 of the 64 credits required for graduation. Required core courses include environmental health, toxicology, epidemiology, risk sciences, and statistics. Students have flexibility to customize the remaining elective credits of their curriculum to their area of interest to achieve an appropriate balance between depth and breadth.

Students should consult the student resources page (<https://my.publichealth.jhu.edu/Departments/EHS/StudentResources/Forms/ByCategory.aspx>) which lists all core requirements as well as electives in the department and get formal approval from their faculty adviser prior to registration. There are several options ranging from introductory to advanced; choosing between them involves a discussion of student goals, background in these areas, schedule, and area of interest.

To substitute a course with something not listed, approval must be granted by the program director. Students may also consider earning certificates (<https://publichealth.jhu.edu/academics/academic-program-finder/certificate-programs/>) while earning the ScM. Students should discuss options for meeting the biostatistics and epidemiology course requirements with their adviser.

Course location and modality is found on the BSPH website (<https://publichealth.jhu.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
<i>Biostatistics</i>		<i>varies</i>
<i>Epidemiology</i>		<i>varies</i>
<i>Electives</i>		

## 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	Water and Sanitation in Low-Income Communities	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	3
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	4
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

## Written Proposal and Research Committee

The written proposal serves as the written comprehensive examination and 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. Such a broader perspective will draw upon courses the student took in their first year.

The research committee will have a minimum of two people, consisting of the research adviser and one to two other faculty members. These members should include at least one other member from the department and may include someone from outside the department, whose expertise is valuable to the student's project. These individuals will serve as a student resource throughout the research year, meeting at least one or two more times between terms 1 and 3.

The Committee typically meets in late spring, as the student finishes their first-year coursework and the adviser has approved a first draft of their proposal. At least two weeks before the first meeting, students must submit a completed ScM Research Committee Form to the academic team. The student's adviser serves as chair of the Committee and will get the student's file from the academic team prior to the first meeting.

Typically, the student presentation lasts 15-20 minutes, followed by 45-minutes of comments and questions. In private, the Committee members discuss suggestions for what the student should explore with their adviser as it pertains to their research project. The adviser returns the file to the academic team who then notifies the Registrar and CAS (the Committee on Academic Standards) of the outcome.

If the Committee provides specific recommendations, these must be presented in detail to the student, along with the plan for confirming their fulfillment. The conditions must be fulfilled prior to the start of full-time research, unless otherwise decided by the committee. The Masters Tuition Scholarship will not be applied if students haven't completed these steps before the beginning of the 1st term in their second year.

## Second Year

After completing fourth-term coursework and a successful first meeting with their committee, the student begins a year-long research project under the direction of their adviser. The department highly recommends that ScM students begin research in the summer between the program's first and second year.

During the second year, full-time enrollment must be maintained by taking a minimum of 16 credits of 183.825 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 must complete the program at the end of their second year's fourth term and graduate in May.

If at any point after the first year, the student is unable to successfully complete their research project and thesis, the student will be transferred back to the MHS program and be eligible for graduation with that degree. The completed research document will be considered as fulfilling the MHS essay requirement. Deadlines for the second year can be found on the master's candidate page (<https://my.publichealth.jhu.edu/Offices/StudentAffairs/RecordsRegistration/MastersCandidateInformation/Pages/default.aspx>); these dates are subject to change each year so the dates in the table at the end of this section are meant to give a general idea for planning purposes. Students should use the master's candidate

page for official deadlines and make sure advisers approve of their timeline.

Date	Event
Early February	Students verify with the senior academic team that they are on track to graduate
Early March	Submit first draft of your thesis to adviser for feedback, submit thesis form to BSPHEXams@jhu.edu
Mid March	Submit thesis reader appointment form to the Office of Records & Registration (BSPHEXams@jhu.edu)
Early April	Students submit final draft of their thesis to their adviser and thesis reader
Late April	Submit thesis to JHU Electronic Thesis or Dissertation (ETD) system
Early May	Submit thesis acceptance letters to the Office of Records & Registration and approval of electronic copy of thesis from Sheridan Library.
Early May	MHS/ScM Presentations

## Research and Thesis Requirements

The ScM degree requires successful completion of a research project and the writing of a master's thesis based on that work. A thesis form must be submitted to BSPHEXams@jhu.edu approximately six months after completing the written comprehensive exam. This form can be found on the student resource page (<https://my.publichealth.jhu.edu/Departments/EHS/StudentResources/Forms/ByCategory.aspx>). 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 Sheridan Libraries website (<https://www.library.jhu.edu/library-services/electronic-theses-dissertations/formatting-requirements/>). Document quality must be suitable for publication in a peer-reviewed scientific journal. Example sections include: Abstract, Background, Methods, Publishable Paper, Conclusions, Appendix (Raw Analysis Results).

## Appointment of the Committee of Thesis Readers

The thesis committee comprises the student's research adviser and at least one other faculty member from any department within Johns Hopkins University. Only one committee member may be an adjunct; the other(s) must be full-time (professor, scientist, lecturer, instructor of any rank). Emeriti faculty may serve on the committee; however, visiting faculty may not. The student and research adviser should identify a second thesis reader and obtain their agreement to serve on the committee.

Once a thesis reader has agreed to serve on the committee, the student must submit a thesis reader appointment form to the academic team by the deadline proposed by the registrar. Students can find thesis deadlines on the student resources page (<https://my.publichealth.jhu.edu/Departments/EHS/StudentResources/Forms/ByCategory.aspx>). The form requires the signatures of the research adviser, department chair, and academic team; it certifies that the student has completed all school and departmental requirements for the degree, except for the thesis.

The student is responsible for distributing the thesis to their research adviser and the thesis reader at least four weeks before the student expects to complete the degree. The adviser and thesis reader should

review the thesis in a timely manner and send a letter to the student listing any recommended changes. The thesis reader will also send the adviser a copy of the letter. It is the responsibility of the adviser to adjudicate suggested revisions and approve the final version of the thesis. The adviser will then submit a letter to that effect to the registrar.

Completion of the degree is not finalized until the registrar receives letters from the adviser and thesis reader approving the thesis, and the student submits an electronic version of the dissertation to the JHU Electronic Theses & Dissertations (ETD) system. (<https://www.library.jhu.edu/library-services/electronic-theses-dissertations/>)

## Presentation

Graduating students must present their research during the MHS & ScM Student Presentations in May. Presentations should be ten minutes in length followed by five minutes of questions and answers from faculty and students. The academic team will work with students to schedule presentations.

The Department requests one bound copy of the thesis; all copies are placed in W7023. The School recommends using Thesis on Demand (<https://www.thesisondemand.com/>). The binding should be black and include the student's name, degree, and year on the spine, the thesis title and name on the front.

## 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 advisor 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.

## research Human Subjects

The Johns Hopkins University is committed to protecting the rights and welfare of all individuals participating as subjects in research. To meet this obligation, the Bloomberg School has two on-site Institutional Review Boards and an external IRB (the Western IRB) that review studies

on the School's behalf. All faculty and students who are involved in human subject research must meet the compliance training requirements of the Bloomberg School IRB. It is the responsibility of students and faculty to make certain that approval is obtained from the IRB before beginning any research involving human subjects. The IRB is also responsible for determining whether certain research activities qualify for exempt status under the regulations and institution policy.

For IRB announcements and updates, and for additional information and requirements on conducting human research, please contact either the:

- Bloomberg School's IRB Office, Room E1100, Wolfe Street Building (410-955-3193); email at [jhsph.irboffice@jhu.edu](mailto:jhsph.irboffice@jhu.edu) or Homewood IRB Office
- Homewood IRB Office (<https://homewoodirb.jhu.edu/%20participants/>) (410-516-4820); email at [levans22@jhu.edu](mailto:levans22@jhu.edu); ([levans22@jhu.edu](mailto:levans22@jhu.edu)) <https://homewoodirb.jhu.edu/> (<https://homewoodirb.jhu.edu/%20participants/>) (<https://homewoodirb.jhu.edu/%20participants/>)

### Animal Research

The Johns Hopkins University is committed to protecting the rights and welfare of animals used in research. All students involved in animal research must first complete an online training module, Animal Care and Use, available through myLearning in the JHU Portal, before beginning work with animals. Additional training may also be required. Students must also be listed as student investigators on projects they are working on that involve animals.

The care and use of animal subjects are regulated by the Animal Welfare Act, which is implemented by the U.S. Department of Agriculture. The University has one assurance with the federal government (the Office of Laboratory Animal Welfare [OLAW]) and, therefore, the University has one animal care and use committee (IACUC). Faculty from the Bloomberg School, the School of Medicine, and the Homewood campus serve on this committee. An approved protocol MUST be obtained before animals can be purchased. Questions regarding submission of animal research protocols should be addressed to the IACUC Office at 443-287- 3738. Animal care and procurement are under the purview of Johns Hopkins Research Animal Resources. (<https://researchanimalresources.jhu.edu/>)

For those exposed to animals either directly or indirectly, their bedding, waste products, fresh animal tissues, or equipment involved in animal use and care, Johns Hopkins requires the following to reduce health risks associated with animal exposures. You may view the full animal research policy here. (<https://e-catalogue.jhu.edu/public-health/policies/research/animal-research/animal-research.pdf>)

### CODE OF CONDUCT

The fundamental purpose of the Johns Hopkins University's (the "University" or "JHU") regulation of student conduct is to promote and to protect the health, safety, welfare, property, and rights of all members of the University community as well as to promote the orderly operation of the University and to safeguard its property and facilities. As members of the University community, students accept certain responsibilities which support the educational mission and create an environment in which all students are afforded the same opportunity to succeed academically.

Allegations of sexual misconduct are covered by JHU's Sexual Misconduct Policy and Procedures (<https://oie.jhu.edu/sexual-misconduct/>) for faculty, staff, and students. The University encourages individuals to report incidents of sexual misconduct and provides a variety of avenues, both formal and informal, by which individuals can report complaints of sexual harassment. Allegations of sexual

harassment by students are covered under the JHU program and under the Student Conduct Code. (<https://studentaffairs.jhu.edu/policies-guidelines/student-code/>)

### Personal Relationships

The Johns Hopkins University is committed to the personal, academic, and professional well-being and development of its students, trainees, faculty, staff, postdoctoral fellows, clinical residents, and all other members of the University community. The University seeks to maintain an atmosphere of mutual respect, collegiality, fairness, and trust. The Personal Relationships (<https://policies.jhu.edu/doc/fetch.cfm/HVZArki5/>) Policy (<https://policies.jhu.edu/doc/fetch.cfm/HVZArki5/>) implements the University's commitment to maintaining the integrity of its educational and working environment. This policy focuses on the conflict of interest that may exist when individuals simultaneously engage in both personal and professional relationships in which one individual has the potential to exert substantial academic or professional influence over the other.

### ETHICS POLICIES

All members of the Johns Hopkins community are responsible for immediately informing the Academic Ethics Board of the Bloomberg School of Public Health of any suspected violations of its Constitution. The Ethics Board, composed of six students and four faculty members, is responsible for implementing its Constitution according to the procedures set forth therein. This includes formal hearings of suspected violations.

Allegations of fraud in research by students will be handled and resolved according to the policies and procedures specified in Faculty PPM 7 – Research Misconduct. Penalties for students who are found responsible for engaging in fraud in research under Faculty PPM 7 may be selected from among the penalties specified in the Student Academic Ethics Code (Student PPM 1) as appropriate.

Allegations of violations of academic integrity by students in the School are covered under the policies and procedures contained in PPM for Students - 1 (Academic Ethics) and the School's Academic Ethics Code. Allegations of unsatisfactory performance or unacceptable behavior by faculty are covered by PPM Faculty - 8 (Procedure for Handling Allegations of Unsatisfactory Performance or Unacceptable Behavior), and allegations of fraud or misconduct during the conduct of research by faculty are covered by PPM Faculty - 7 (Fraud in Research).

Allegations of misconduct by staff are covered by policies and procedures established by the University Office of Human Resources as stated in the Personnel Policy Manual. (This information is taken from the School's POLICY AND PROCEDURE MEMORANDUM STUDENTS – 1, (<http://my.jhsph.edu/Resources/PoliciesProcedures/ppm/Pages/default.aspx>) SUBJECT: Academic Ethics (<http://my.jhsph.edu/Resources/PoliciesProcedures/ppm/Pages/default.aspx>)).

### parental accommodations

Please see the university page on parental accommodations ([https://homewoodgrad.jhu.edu/student-services/family-resources-for-students-and-postdoctoral-fellows/#%3A~%3Atext%3DConsistent%20with%20grant%20funding%20policies%2Cthe%20accommodation\)%20new%20child%20accommodations](https://homewoodgrad.jhu.edu/student-services/family-resources-for-students-and-postdoctoral-fellows/#%3A~%3Atext%3DConsistent%20with%20grant%20funding%20policies%2Cthe%20accommodation)%20new%20child%20accommodations)) for full-time graduate students and post-doctoral fellows.

### LEAVE OF ABSENCE

If it becomes necessary to take a break from studies, students should contact their advisor and academic program manager to determine if a formal leave of absence (<https://studentaffairs.jhu.edu/viceprovost/>)

student-leave-of-absence-policy/) (LOA) is necessary. Any request for change of status must be discussed with the program or track director(s) and academic program manager and approved by the department and school. For more information, please visit the University Policy (<https://e-catalogue.jhu.edu/university-wide-policies-information/academic-policies-information/leave-absence-policy/>).

### Travel resources

While BSPH encourages participation in opportunities to supplement students' education or research in other countries, international tensions can be high and the resources on the U.S. International Travel website (<https://travel.state.gov/content/travel/en/international-travel.html>) may assist students in making an informed decision.

Students are not obligated to travel internationally, and each student has the right to decline to travel abroad. If the student is supported by a research project that requires such travel and the student chooses not to travel, the student may be removed from that project following discussions with the principal investigator and the EHE program or track directors.

Graduate students who decide to travel abroad must demonstrate that they understand and voluntarily accept the risks inherent in international travel. To do so, students must first receive the appropriate departmental approvals for the trip through their advisor and program or track director(s). Students should also evaluate options for registering travel and obtaining pre-travel immunizations through the school or health care system.

### Immunizations

If students are traveling to a less-developed part of the world, they should be certain to contact their health care provider or the Johns Hopkins International Travel clinic to learn about recommended immunizations and other matters to guard their health. Located on the East Baltimore campus, students can reach the International Travel Clinic (<https://globalhealth.jhu.edu/>) by telephone at 410-955-8931.

### Stay Informed

Students are encouraged to vigilantly monitor consular and press reports regarding the country (or countries) where they plan to travel. Students may also check the consular reports of countries friendly to the U.S. (e.g. Australia (<https://www.smarttraveller.gov.au/destinations/>), Canada (<https://travel.gc.ca/travelling/advisories/>), United Kingdom (<https://www.gov.uk/foreign-travel-advice/>)) as well as reports from other international agencies (e.g. United Nations). Students should participate in the security briefings offered by other organizations with whom they may be working.

### Maintain Communication

When traveling in an area where regular communication is difficult, students are encouraged to maintain contact with their advisor and/or the academic program manager.

### State Department Registration

For students who are likely to stay for a prolonged period in a high-risk area of the world, registration at the U.S. embassy or consulate is essential.

### International Students

OIS may be contacted at 410-955-3371. International students must contact the Office of International Services (<https://ois.jhu.edu/>) (OIS) well in advance of any travel to avoid compliance issues with their visa status.

### Healix International

Johns Hopkins has implemented a comprehensive travel assistance program supported by Healix International. For more information visit the International Travel for the University & Health System (<https://risk.ssc.jhu.edu/international-travel/>) page.

### PROGRAM FUNDING

The Masters Tuition Scholarship is available for second-year students enrolled in 12 or more credits in the ScM program. Second-year students must have successfully completed 64 credits of coursework in their first year and have successfully completed the ScM Written Proposal and Research Committee Meeting 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, Grade Point Average (GPA), and registration requirements. In addition, ScM students must complete at least 12 credits of formal coursework outside of EHE. At least six of these credits must be taken in the School of Public Health. The MTS is worth up to 75% off tuition.

### Career Development Resources

BSPH's Career Services (<https://publichealth.jhu.edu/offices-and-services/office-of-student-affairs/career-services/>) office provides resources and guidance, including:

- Personal career and life-design planning for students and alumni
- Career workshops and events throughout the year
- A comprehensive Career Planner with resume template
- Exclusive access to sponsored career resources
- An outstanding Public Health Career Fair held each spring
- A robust database of public health jobs, internships, and public health employers

### DISABILITY SERVICES

The Bloomberg School of Public Health is committed to the holistic well-being of its students and offers a wide spectrum of support as they progress toward becoming confident, capable, and fulfilled leaders in public health. Visit the Student Disability Services (<https://publichealth.jhu.edu/about/inclusion-diversity-anti-racism-and-equity-idare/student-disability-services/>) page for more information and how to request accommodations.

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.