Environmental Health Sciences, Ph.D.

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https://sites.uci.edu/publichealthehs/

The Department of Environmental and Occupational Health provides graduate training in environmental health sciences and offers the Ph.D. in Environmental Health Sciences. The Ph.D. program offers tracks in Environmental Toxicology and in Exposure Sciences and Environmental Epidemiology. The program in Environmental Health Sciences provides students with the knowledge and skills necessary and appropriate to teach and/or conduct basic and applied research programs in inhalation/pulmonary toxicology, neurotoxicology, reproductive and developmental toxicology, chemical pathology, toxicokinetics, radiation toxicology, molecular carcinogenesis, exposure sciences, environmental and occupational epidemiology, risk assessment, environmental justice, and community-based participatory research.

Environmental Toxicology involves the scientific study of the entry, distribution, biotransformation, and mechanism of the action of chemical and physical agents that are harmful to the body. The graduate program interprets environmental toxicology as the study of the effects and mechanisms of action of hazardous chemical and physical agents in food, air, water, and soil in the home, the workplace, and the community. It considers experimentally and theoretically such diverse research problems as:

- new scientific approaches to toxicological evaluation of environmental chemicals (e.g. air and water pollutants, food additives, industrial wastes, and agricultural adjuvants) and physical agents (e.g. radiation) at the molecular, cellular, and organism levels
- mechanisms of action in the toxicity of chemical and physical environmental agents
- the molecular pathology of tissue injury in acute and chronic toxicity

Exposure Sciences involves the study of human exposures to chemical environmental contaminants in different media such as air, water, food, and soil and via multiple routes including inhalation, ingestion, and dermal absorption, as well as exposures to physical environmental agents such as radiation, temperature, noise, and other built environment factors. Environmental Epidemiology examines the effects of exposure to environmental agents and other factors on health outcomes. Research in the Exposure Sciences and Environmental Epidemiology Track includes:

- new approaches to the evaluation of human exposures to environmental chemicals, including exposure measurement, modeling, and biomonitoring
- assessing individual and population level exposures to chemical and physical environmental agents and examining associations of these exposures with health and disease outcomes
- exposure to chemical, physical, and psychosocial work environment hazards and health outcomes
- environmental justice and community-based participatory research to improve health equity

Students entering the program have varied backgrounds, including chemistry, biology, physiology, environmental science/engineering/health, epidemiology, and public health. The curriculum is based on a foundation of basic and health sciences with applications of scientific principles to environmental exposures and their potential health effects. Formal course work is enriched by a strong commitment to student-professor interaction throughout the program. An important and integral part of the learning process is an early and intensive involvement of the student in ongoing original research projects in environmental health sciences, especially inhalation/pulmonary toxicology, reproductive and developmental toxicology, biochemical toxicology, chemical pathology, neurotoxicology, exposure sciences, risk assessment, environmental epidemiology, environmental justice, and community-based participatory research. Research grants and contracts are available to support qualified doctoral students as research assistants.

In addition to meeting the general admission requirements set by the Graduate Division, applicants must be admitted by an Admissions Committee composed of faculty members of the graduate program. Candidates will be selected on the basis of a balanced evaluation of the following criteria, with no one factor having more influence (1) prior scholastic performance, including a consideration of grades, course load, nature of courses taken, and college attended; (2) recommendations by professors and others; (3) experience in undergraduate and/or post-baccalaureate research; (4) an interview by members of the Admissions Committee and other faculty members, when feasible; and (5) scores for the general Graduate Record Examination test (GRE), which is temporarily waived for Fall 2023 enrollments.

Undergraduate preparation of applicants should include one year of biology (one quarter of molecular biology or biochemistry is strongly recommended), one year of mathematics (calculus and/or statistics), and one year of chemistry. Outstanding applicants who lack one or two of these prerequisites may be given an opportunity to take the required course(s) either before admission or during the first year in the graduate program; in such circumstances, none of these required undergraduate courses may be used to satisfy the program elective or core course requirements. Upper-division or graduate science courses may be considered as substitutes for the above prerequisites by the Admissions Committee.

Doctor of Philosophy in Environmental Health Sciences
All courses must be passed with an average grade of B or better.

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<th>Program-wide Core Curriculum</th>
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<tr>
<td>A. Complete the following:</td>
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<tr>
<td>PUBHLTH 206A</td>
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<td>Principles of Epidemiology</td>
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<td>Course Code</td>
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<tr>
<td>PUBHLTH 204</td>
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<td>EHS 264</td>
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<td>EHS 298</td>
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<td>EHS 299</td>
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**Select one track and complete track-specific requirements:**

1. **Environmental Toxicology Track**

   B. Complete:
   - EHS 202: Principles of Environmental Toxicology
   - EHS 206A: Target Organ Toxicology I
   - EHS 206B: Target Organ Toxicology II
   - EHS 201: Case Studies in Environmental Toxicology

   C. Complete 16 units from the approved elective pool.

2. **Exposure Sciences and Environmental Epidemiology Track**

   D. Complete:
   - PUBHLTH 283: Geographic Information Systems for Public Health
   - PUBHLTH 204B: Biostatistics II: Intermediate Statistical Methods
   - EPIDEM 205: Environmental Epidemiology
   - EHS 275: Environmental Modeling and Risk Management

   E. Select one of the following:
   - EHS 202: Principles of Environmental Toxicology
   - EHS 206A: Target Organ Toxicology I
   - EHS 206B: Target Organ Toxicology II

   F. Complete 12 units from the approved elective pool.

**Approved elective pool for both tracks:**

- EHS 203: Psychosocial Occupational Epidemiology
- EHS 204: Neurotoxicology
- EHS 212: Inhalation Toxicology
- EHS 220: Industrial Toxicology
- EHS 269: Air Pollution, Climate, and Health
- EHS 294: Health Psychology
- EPIDEM 244: Toxic Chemicals in Environment
- ANATOMY 203A: Human Microscopic Anatomy
- ANATOMY 203B: Human Microscopic Anatomy
- DEV BIO 231B: Cell Biology
- MOL BIO 203: Nucleic Acid Structure and Function
- MOL BIO 204: Protein Structure and Function
- PHYSIO 206A: Introduction to Medical Physiology
- PHYSIO 206B: Intermediate Epidemiology
- PUBHLTH 206B: Advanced Epidemiologic Methods
- PUBHLTH 206C: Biostatistics III: Advanced Statistical Methods
- PUBHLTH 209: Methods of Demographic Analysis
- PUBHLTH 280: Infectious Disease Epidemiology
- PUBHLTH 281: Advances in Social Epidemiology
- PUBHLTH 286: Advanced Geographic Information Systems and Spatial Epidemiology
- EPIDEM 232: Chronic Disease Epidemiology & Prevention
- STAT 203: Statistical Methods for Data Analysis III
- PUBHLTH 222: Health Policy and Management
- PUBHLTH 223: Risk Communication

K. Fulfill the following:
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<td>Comprehensive Exam</td>
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<td>Qualifying Exam</td>
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<td>Teaching Requirement</td>
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<td>Research Dissertation</td>
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1. All graduate students in the program will be required to take EHS 298 every academic quarter they are enrolled in the graduate program.
2. Enroll during research rotations and dissertation research.
3. Track-specific core courses for one track may be taken as electives for other track.

The normative time for advancement to candidacy is three years. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Please refer to our website (https://sites.uci.edu/publichealthehs/) for updated information about course offerings, and pre-approved electives for this degree.