

Environmental and Occupational Health

College of Health and Human Development

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Programs

Undergraduate:

B.S. in Environmental and Occupational Health

Option in Industrial Hygiene

Minor in Environmental and Occupational Health

Graduate:

M.S. in Environmental and Occupational Health

Option in Industrial Hygiene

Accreditation

The degrees are accredited by the National Environmental Health Science and Protection Accreditation Council at the B.S. and MS levels. The B.S. Option in Industrial Hygiene option is accredited by the Applied Science Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202, (410) 347-7700.

The California Department of Health Services provides a formal approval of the degree at both the M.S. and B.S. levels. With this approval, students are permitted to test for the Registered Environmental Health Specialists (REHS) examination immediately upon graduation. Students graduating from programs without this approval must have at least one year of work experience before being permitted to take this examination.

The Major

Environmental and Occupational Health (EOH) is concerned with the biological, chemical and physical factors affecting human health and the environment. Our major provides a solid science-based education with practical applications for a safer and healthier environment. As a result, our graduates work in a variety of high demand jobs such as air quality, water quality, food safety, housing, industrial hygiene, safety, hazardous waste management, environmental consulting and radiation safety. Our graduates also work in a wide range of settings including private industry (aerospace, manufacturing, food production, biotechnology and many others), local government (city and county health departments), state government (Cal OSHA and Cal EPA), federal government (Public Health Service, EPA, OSHA, Department of Health and Human Services), unions, public interest groups, universities and lobbying organizations.

Our courses are explicitly designed to give students the skills needed to succeed on the job. Local employers, many of whom have graduated from this very department, routinely seek our graduates as new hires. As one of the largest programs of its kind in the nation, we have an extensive network of environmental and occupational health professionals dedicated to the protection of the environment and community as well as worker health and safety.

The B.S. degree lays the scientific and practical foundation for a career in EOH. Students are eligible for entry-level jobs in a wide range of locations at competitive salaries. The M.S. degree is designed to prepare the graduate for higher-level professional activities including research, analysis and management of EOH systems.

Careers

Graduates find work in such occupations as: environmental specialists, industrial hygienists, hazardous waste managers, air quality permit managers, safety supervisors, health and safety inspectors, environmental managers and many similar occupations.

Our graduates are also employed as administrators as well as technical specialists in governmental agencies, private industry and consulting firms. Opportunities for teaching, research and advanced professional programs are numerous.

The degrees also serve as excellent preparation for health professions such as medicine, dentistry, and optometry. Many graduates of the Department of EOH pursue advanced academic degrees leading to teaching and research opportunities.

Academic Advisement

All majors are required to review their academic program in consultation with an advisor once per semester. The undergraduate advisors are Peter Bellin, Antonio Machado, Owen Seiver and Michael Sullivan. The graduate advisor is John Schillinger. Please contact the department to make an appointment for academic advisement.

Student Learning Outcomes of the Undergraduate Program

Graduates of the undergraduate program in Environmental and Occupational Health should be able to:

1. Demonstrate a comprehensive knowledge of the recognition, evaluation, and control of biological, chemical, and physical factors that can impact human health and safety and the environment.
2. Demonstrate knowledge of how to work in interdisciplinary teams to promote public and private action to protect public health and the environment.
3. Communicate environmental and occupational health concepts and programs to a variety of audiences, using both written and verbal forms of communication.
4. Apply mathematical and critical reasoning to understand and incorporate new concepts in the field.
5. Demonstrate knowledge of organizational management and leadership skills.
6. Demonstrate knowledge of current regulatory and policy issues.

Student Learning Outcomes of the Graduate Program

1. Research design and analytical skills needed to critically evaluate scientific, technical and regulatory documents.
2. Oral, written and electronic communication skills to present information to professional groups, regulatory agencies and lay audiences.
3. Sufficient level of technical expertise in environmental and occupational health to competently solve general EOH problems.
4. A broad set of management skills to:
 - a. competently manage an environmental or occupational program
 - b. initiate program planning and critical analysis of environmental or occupational health and safety program. Initiate program planning and critical analysis of environmental or occupational health and safety programs.

Requirements for the Bachelor of Science Degree

1. Lower Division Required Courses (40 Units)

HSCI 132 History of Preventive Medicine (3)
 or HSCI 345 Topics in Public Health (3)

Choose one of these two sets:

BIOL	101/L	Introductory Biology (4)
BIOL	281	Human Physiology (3)
BIOL	282	Human Physiology Lab (1)
	or BIOL 106/L	Biological Principles I and Lab 3/1
BIOL	107/L	Biological Principles II and Lab (3/1)

Choose one of the following:

BIOL	215	Introductory Microbiology (4)
	or EOH 455/L	Microbiological Hazards in Environmental Health/Lab (preferred) (3/1)

Take both of the following:

PHYS	100A/L	General Physics I and Lab (3/1)
PHYS	100B/L	General Physics II and Lab (3/1)

Choose one of the following:

MATH	103	Mathematical Methods for Business I (3) (required for IH option)
	or MATH 105	Pre-Calculus (5)

Choose one of these two sets:

CHEM	101/L	General Chemistry I and Lab (4/1)
CHEM	102/L	General Chemistry II and Lab (4/1)
	or CHEM 103	Introductory Chemistry I (4)
CHEM	104	Introductory Chemistry II (4)

Choose one of the following:

CHEM	235	Introductory Organic Chemistry (4)
	or CHEM 333	Principles of Organic Chemistry I (4)
	and CHEM 334	Principles of Organic Chemistry II (4)

2. Upper Division Required Courses (24 Units)

EOH	352	Environmental Health Policy, Law and Administration (3)
EOH	356A	Environmental Health I (3)
EOH	356B	Environmental Health II (3)
EOH	456	Fundamentals of Toxicology (3)
EOH	466A	The Occupational Health Environment (3)
HSCI	488	Epidemiology: Introduction to Study of Disease (3)
EOH	494B	Academic Internship (2)

Choose one of the following:

HSCI	390/L	Biostatistics and Lab (3/1)
	or MATH 140	Introductory Statistics (4)

3. Electives (15 Units)**Select from the following, with advisor approval:**

EOH	365	Principles of Accident Prevention (3)
EOH	453	Health and Physical Aspects of Housing (3)
EOH	454	Environmental Health Law (3)
EOH	457	Water Supply and Sewage Disposal (3)
EOH	458	Vector Control (3)
EOH	459	Hazardous Waste Management (3)
EOH	465	Occupational Safety (3)
EOH	466B/L	Evaluating the Occupational Environment and Lab (3/1)
EOH	466C	Controlling the Occupational Environment (3)
EOH	467	Radiological Health (3)
EOH	468	Air Pollution and Health (3)
EOH	469	Environmental Risk Analysis (3)
EOH	560	EOH Epidemiology (3)
EOH	570	Occupational Ergonomics (3)

Note that A minimum grade of C is required in all courses within the major.

General Education (40 Units): Several classes from the lower division requirements overlap with GE requirements.

Total Units in the Major	79
Total units required for Degree	125

A. Option: Industrial Hygiene (16)

Graduates with a B.S. in Environmental and Occupational Health with the Industrial Hygiene Option are prepared for entry-level work in positions such as industrial hygiene, hazardous waste management, environmental compliance and a variety of similar positions.

1. Required Courses

Identical to the EOH list, plus the following:

EOH	466B/L	Evaluating the Occupational Environment and Lab (3/1)
EOH	466C	Controlling the Occupational Environment (3)
EOH	465	Occupational Safety (3)

Choose two of the following:

EOH	459	Hazardous Waste Management (3)
EOH	467	Radiological Health (3)
EOH	468	Air Pollution and Health (3)
EOH	469	Environmental Risk Analysis (3)
EOH	560	EOH Epidemiology (3)
EOH	570	Occupational Ergonomics (3)

Total units

80

Minor in Environmental and Occupational Health**1. Science Prerequisites (32 Units)**

BIOL	101/L	General Biology (3/1)
BIOL	281/282	Human Physiology (3/1)
CHEM	103/104	General Chemistry (4/4)
CHEM	235	Introductory Organic Chemistry (4)
PHYS	100A/L	General Physics I and Lab (3/1)
PHYS	100B/L	General Physics II and Lab (3/1)

Choose one of the following:

BIOL	215	Introductory Microbiology (4)
HSCI	455/L*	Microbiological Hazards in Environmental Health and Lab (3/1)

*preferred choice

2. Minor Requirements (21 Units)

EOH	352	Environmental Health Policy, Law, and Admin. (3)
EOH	356A	Environmental Health I (3)
EOH	356B	Environmental Health II (3)
EOH	466A	Occupational Health (3)
HSCI	488	Epidemiology (3)
EOH	494	Academic Internship (2)

Choose one of the following:

HSCI	390/L	Biostatistics and Lab (3/1)
	or MATH 140	Introductory Statistics (4)

Total units required including science prerequisites

75

Requirements for the Master of Science Degree

The following criteria are used to evaluate prospective candidates for the Master of Science in Environmental and Occupational Health:

1. Overall grade point average and science grade point average,
2. Undergraduate degree in Environmental and Occupational Health (or a related scientific discipline),
3. Work experience in environmental and occupational health or a related discipline,
4. Graduate Record Exam (usually waived if undergraduate GPA is above 3.0),
5. References.

1. Required Courses (18 Units)

EOH	553	Administration of EOH Programs (3)
EOH	554	Seminar: EOH Problems (3)
EOH	555	Seminar: EOH Programs, Standards and Controls (3)

EOH	693A	Supervised Field Training (2)
EOH	696A	Research Design (4)
EOH	696B	Seminar: Research Methodology (3)

2. Electives (12 Units)

Each student's program must include a minimum of 21 units in 500 and 600-level courses. At least three units must be taken from the following:

EOH	560	EOH Epidemiology (3)
EOH	565	Seminar: Industrial Safety (3)
EOH	570	Occupational Ergonomics (3)

Additional courses may be taken from the available 400-level elective courses in the Department of EOH. Graduate students must complete supplementary work assignments to receive graduate credit for 400-level courses. A minimum B grade is required for all courses, core and elective.

Capstone**Choose one of the following:**

1. Comprehensive Examination (written, plus optional oral component). As preparation, student registers for EOH 697 Directed Comprehensive Studies (3 units; does not count toward program total)
2. Thesis. After proposal is approved, student registers for EOH 698 Thesis (3 units; counts in program total)

Total Units Required for the Degree	30
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Option: Industrial Hygiene (31 Units)

Graduates with the M.S. in Environmental and Occupational Health, Industrial Hygiene Option, are prepared to enter the field of industrial hygiene, concentrating on such areas as basic industrial hygiene, occupational safety, hazardous waste management, occupational health training, regulatory compliance, work site inspections, and similar fields. Core requirements are identical to those of the M.S. in Environmental and Occupational Health. Graduate seminar courses must involve presentations and research in occupational health.

The additional course requirements are as follows:

EOH	466B/L	Evaluating the Occupational Environment and Lab (3/1)
EOH	466C	Controlling the Occupational Environment (3)
EOH	465	Occupational Safety (3)

Select one from the following:

EOH	560	EOH Epidemiology (3)
EOH	565	Seminar: Industrial Safety (3)
EOH	570	Occupational Ergonomics (3)

Students in this program who select the comprehensive examination capstone must be tested on subject matter from the core classes— EOH 466A,B,C and EOH 465—in addition to any other testing requirements.

Total Units Required for the Industrial Hygiene Option	31
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Course List**EOH 101. Introduction to Environmental Health (3)**

Introduction to the field of Environmental and Occupational Health. Topics reflect those environmental health risks that impact our daily lives, including: restaurant inspection and food safety, water and air pollution, bioterrorism, environmentally induced skin cancers, mold and indoor air quality, workplace hazards, and environmental control of infectious disease. (General Education, Lifelong Learning)

EOH 352. Environmental Health Policy, Law and Administration (3)

Analysis of conceptual models relative to environmental health policy-making laws and program administration.

EOH 353. Global Perspective of Environmental Health (3)

Prerequisite: Completion of Lower Division writing requirement. Provides a perspective and framework for evaluating a broad and dynamic range

of environmental issues—from bioterrorism to global warming to restaurant grading systems. This wide-ranging and topical course provides an overview of the field of Environmental and Occupational Health, including such major subject areas as environmental diseases, food safety, hazardous materials and waste management, vector control, and water and air pollution. Not open for credit for students taking EOH 356A and B. (Available for General Education, Lifelong Learning)

EOH 356A. Environmental Health I (3)

Prerequisite: BIOL 101 or 106/L and CHEM 101/L or 103/L. Preparatory: PHYS 100A/L and 100B/L. In-depth analysis of the physical, chemical, and biological influences on human health and well being.

EOH 356B Environmental Health II (3)

Prerequisite: BIOL 101 or 106/L and CHEM 101/L or 103/L. Preparatory: PHYS 100A/L and 100B/L. In-depth analysis of the physical, chemical, and biological influences on human health and well being.

EOH 365. Principles of Accident Prevention (3)

Epidemiology of accident causation. Methods of prevention and control.

EOH 453. Health and Physical Aspects of Housing (3)

Preparatory: BIOL 101 or 106/L and CHEM 101/L or CHEM 103/L. Examines the impact of the housing environment on the public's health and safety. Topics include: home construction, electrical and plumbing systems, radon gas, lead paint, mold investigation and remediation, housing inspection and hazard assessment.

EOH 454. Environmental Health Law (3)

Study of the major provisions of the law that pertains to the environmental health field. Topics include Clean Air Act, Water Pollution Control Act, Noise Control Act, Occupational Safety and Health Act, and Toxic Substances Control Act. (Offered spring semester)

EOH 455/L. Microbiological Hazards in Environmental Health and Lab (3/1)

Prerequisite: one semester of Biology and one semester of Chemistry; BIOL 101 or 106/L and CHEM 101/L or 103/L. Corequisite: EOH 455L. Preparatory: PHYS 100A/L and PHYS 100B/L. Study of infectious disease agents transmitted through water, wastewater, milk, food, surfaces, and air with a focus on their assessment, prevention and control. Three hrs. lecture. Lab: Standard procedures for basic microbiological analyses with a focus on the collection and lab examination of water, wastewater, milk, foods, surfaces, air, and other environmental samples. Lab 3 hrs. Course fee.

EOH 456. Fundamentals of Toxicology (3)

Prerequisite: one semester of Biology and one semester of Chemistry; BIOL 101 or 106/L and CHEM 101/L or 103/L. Preparatory: CHEM 235 or 334 and 335. Study of the toxic agents in the working environment as they relate to interface between occupational medicine and industrial hygiene.

EOH 457. Water Supply and Sewage Disposal (3)

Prerequisite: one semester of Biology and one semester of Chemistry; BIOL 101 or 106/L and CHEM 101/L or 103/L. Preparatory: PHYS 100A/L and 100B/L. Theory and practice of water supply and sewage disposal in the public and private sectors. (Offered spring semester)

EOH 458. Vector Control (3)

Prerequisite: one semester of Biology and one semester of Chemistry; BIOL 101 or 106/L and CHEM 101/L or 103/L. Preparatory: PHYS 100A/L and 100B/L. Identification and control of arthropods and other vectors of disease. (Offered fall semester)

EOH 459. Hazardous Materials and Waste Management (3)

Preparatory: BIOL 101 or 106/L and CHEM 101/L or 103/L and PHYS 100A/L or 100B/L. Study of major aspects of the management of hazardous waste from the time it is generated to the time it is finally disposed.

EOH 465. Occupational Safety (3)

Study of the way that accidents and incidents occur in the occupational environment. Establishment and maintenance of safety programs are discussed. Collection, analysis and interpretation of safety data are considered. Approaches to safety used by international, national, and local governmental agencies are reviewed as well as those of insurance companies, professional societies, trade associations, and standards and specifications groups. (Offered fall semester)

EOH 466A. The Occupational Health Environment (3)

Prerequisite: one semester of Biology and one semester of Chemistry; BIOL 101 or 106/L and CHEM 101/L or 103/L. *Preparatory:* PHYS 100A/L; 100B/L; MATH 105. Provides an overview of the field of occupational health, with a focus on industrial hygiene. Presents information related to the recognition, evaluation and control of the chemical, physical and environmental factors that can impact on human health in the workplace and the community. (Offered fall semester)

EOH 466B/L. Evaluating The Occupational Environment and Lab (3/1)

Prerequisite: EOH 466A. *Corequisite:* EOH 466BL. *Preparatory:* MATH 140 or HSCI 390/L. Provides the skills needed to measure the levels of chemical and physical hazards in the workplace and the community. Measurement techniques, sampling strategy and industrial hazards are discussed. Lab: provides hands on applications of industrial hygiene monitoring equipment and demonstration of basic principles of the evaluation of airborne and physical hazards (heat and noise). Students use computer word processing and spreadsheets to generate written summaries, graphs and data analysis. Lab 3 hrs. Course fee. (Offered spring semester)

EOH 466C. Controlling The Occupational Environment (3)

Prerequisites: one semester of Biology and one semester of Chemistry; BIOL 101 or 106/L and CHEM 101/L or 103/L. *Preparatory:* PHYS 100A/L; 100B/L; MATH 105. Overview of design and evaluation of industrial ventilation and noise control systems used to protect the health and safety of workers. Students are provided the basic skills necessary to review drawings and specifications, trouble shoot and improve existing control systems, and establish and conduct testing and maintenance programs.

EOH 467. Radiological Health (3)

Prerequisite: one semester of Biology and one semester of Chemistry; BIOL 101 or 106/L and CHEM 101/L or 103/L and Math 105. *Preparatory:* PHYS 100A/L and 100B/L and MATH 140 or HSCI 390. Comprehensive coverage of ionizing radiation with emphasis on health effects, measurement and protection. (Offered fall semester)

EOH 468. Air Pollution and Health (3)

Prerequisite: one semester of Biology and one semester of Chemistry; BIOL 101 or 106/L and CHEM 101/L or 103/L. *Preparatory:* PHYS 100A/L; 100B/L. Investigation of the relationship between air pollutants and their effects on plants and animals. Emphasis on understanding the health effects in human populations. (Offered spring semester)

EOH 469. Environmental Risk Analysis (3)

Prerequisites: BIOL 101 or 106/L and 101/L or CHEM 103/L. Examines the assessment, communication, and management of environmental risks. "Environmental" concerns are limited to agents that are: 1) environmental or occupational in origin, and 2) hazardous to human health. "Risk" refers to the subjective as well as objective measurement of probabilistic events; recognize uncertainties with such information.

EOH 494B. Academic Internship (2)

Prerequisite: Consent of instructor. Supervised internship in an official and/or voluntary health agency. Includes staffing conferences. (Credit/No Credit Only)

EOH 496A-Z. Experimental Topics (3)**EOH 499A-C. Independent Study (1-3)****EOH 553. Administration of Environmental and Occupational Health Programs (3)**

Comprehensive analysis of environmental and occupational health program planning, with emphasis upon program management. (Offered fall semester)

EOH 554. Seminar: Environmental and Occupational Health Problems (3)

Prerequisite: EOH 356A or 356B or 466A. Critical analysis of the literature related to environmental and occupational health problems. (Offered fall semester)

EOH 555. Seminar: Environmental and Occupational Health Programs, Standards and Controls (3)

Prerequisite: EOH 356A or 356B or 466A. Critical analysis of current literature related to environmental and occupational health programs and standards. (Offered spring semester)

EOH 560. Eoh Epidemiology (3)

Prerequisites: EOH 356A; 356B; 466A; HSCI 488. Applied science course. Introduces both basic and advanced epidemiological concepts and focuses on environmental and occupational health issues with a special emphasis on exposure monitoring, use of biomarkers and risk assessment.

EOH 565. Seminar: Industrial Safety (3)

In-depth study of the causes, measurement, evaluation and control of safety problems found in the industrial environment.

EOH 570. Occupational Ergonomics (3)

Focus on prevention of work-related musculoskeletal disorders (WRMDs) through the application of occupational ergonomics principles. Topics include: the prevalence of and incidence of WRMDs, job/task analysis, postural analysis, tools and workstation design, and job design. Scientific basis of current regulations, such as California's repetitive motion injuries regulations, and guidelines such as the ACGIH's TLV-Hand Activity Level are also discussed. Practical ergonomic assessment tools are introduced through case studies and design problems.

EOH 595A-Z. Experimental Topics Courses (1-3)**EOH 693A. Supervised Field Training (2)**

Supervised action research in selected agencies or organizations. (Credit/No Credit Only)

EOH 695A-Z. Experimental Topics Courses in Environmental and Occupational Health (1-3)**EOH 696A. Research Design (4)**

Prerequisite: HSCI 390. Critical consideration of research methodology as applied to environmental and occupational health.

EOH 696B. Seminar: Research Methodology (3)

Prerequisite: EOH 696A and Classified Graduate Students Only. Analysis of research methodology and interpretation and direct application to student-conducted independent research.

EOH 697. Directed Comprehensive Studies (3)

(Credit/No Credit Only)

EOH 698. Thesis or Graduate Project (3)

(Credit/No Credit Only)

EOH 699A-C. Independent Study (1-6)

Prerequisite: At least one graduate-level course. Investigation of a significant problem in the EOH field.