

# ENVIRONMENTAL, AGRICULTURAL & OCCUPATIONAL HEALTH (ENV)

## **ENV 800 ELEMENTS OF INDUSTRIAL SAFETY FOR HEALTH SCIENCES 3 Credit Hours**

An introduction to safety in the general work environment with emphasis on selected OSHA safety regulations, human costs of injuries, safety programs and management, field trip work observations, risk assessment, hazard/risk communications. No previous experience or coursework in safety is required.

Prerequisite: ENV 892 or equivalent introductory environmental health sciences course, permission of instructor.

Cross List: CPH 590.

Typically Offered: SPRING

## **ENV 801 INTRODUCTION TO GIS IN PUBLIC HEALTH 3 Credit Hours**

This course is designed to examine human-environment interactions and the influence of these interactions on public health in today's data-driven health care systems. Spatial data and information from spatiotemporal data can be a vital asset in answering the where, when, and why questions related to various health outcomes. This course will utilize a Geographical Information System (GIS) to visualize, analyze, manage, and present data. By implementing GIS tools and methods, healthcare providers, public health practitioners, and government agencies can gain a detailed perspective on large-scale and trending health issues such as the COVID-19 pandemic. Topics will be taught in the context of public health, with lectures and examples focused on public health (e.g. determinants of health, health care access, infectious disease epidemiology, environmental exposures, etc.) and supplemented with public health related journal articles to integrate the topics discussed with real world applications.

Prerequisite: None. This course requires no prior knowledge of ArcGIS. A basic understanding of public health, epidemiology, and biostatistics is preferred.

Cross List: CPH 601

Typically Offered: FALL

## **ENV 804 HUMAN FACTORS AND ERGONOMICS FOR WORK ENVIRONMENTS 3 Credit Hours**

An introduction to fundamental concepts of physical work, human abilities and capabilities (ergonomics) including psychological and cognitive aspects of human work performance (human factors) for the reduction of occupational injuries and illnesses, reduced costs, productivity improvement, worker well-being and longevity, quality of work life, and job satisfaction.

Prerequisite: Graduate student status in health sciences or related discipline and permission of instructor.

Cross List: CPH 592.

Typically Offered: FALL

## **ENV 811 AGRICULTURAL HEALTH AND SAFETY 3 Credit Hours**

This course is designed to provide basic information and skills to enable health care and safety professional to function in the anticipation, diagnosis, treatment, and prevention of occupational illnesses and injuries in the farm community.

Cross List: CPH 511.

Typically Offered: SUMMER

## **ENV 812 PRINCIPLES OF FOOD SAFETY 3 Credit Hours**

This course is intended for graduate students and health professionals who have an interest in understanding the complexities of preventing foodborne illness. There are no pre-requisites for this course, however the participants should be comfortable discussing themes that include basic scientific concepts, including chemistry and microbiology. This course is designed to ground the graduate student, professional student, or fellow in an understanding of the multifaceted responsibilities and science behind protecting the public's health through food safety. Major topics to be covered include sources, prevention, detection, management, and regulation of foodborne illness.

Cross List: CPH 600.

Typically Offered: SUMMER

## **ENV 813 PRINCIPLES OF BIOSAFETY 3 Credit Hours**

This course is designed for graduate students and health professionals to explore biosafety principles and practices with the purpose of developing a Biorisk Management approach to biosafety. This will enable participants to "effectively identify, monitor and control the laboratory biosafety and biosecurity aspects of activities. This integrated education will allow the student to recognize risky activities from unintentional and intentional incidents involving biological materials and develop mitigation strategies to reduce exposures to these materials. The student will participate in hands on training using engineering controls as well as administrative controls. Competencies in donning and doffing personal protective equipment and use of a biosafety cabinet will be discussed and assessed. Participants will also learn how to develop a risk mitigation plan following the identification of hazards and risk assessment. The targeted audience include doctoral students interested in occupational health, researchers, professional students, and the biosafety profession.

Cross List: CPH 599

Typically Offered: FALL

## **ENV 814 FUNDAMENTALS OF INDUSTRIAL HYGIENE 3 Credit Hours**

This course provides fundamental knowledge to the graduate student, or fellow who may be interested in pursuing a career in occupational health and safety. The course is also designed for safety, health, environmental and management personnel who have industrial hygiene effort; anticipation, recognition, evaluation and control. Topics include chemical, physical, and biological hazards in the workplace.

Cross List: CPH 598

Typically Offered: FALL

## **ENV 816 ENVIRONMENTAL EXPOSURE ASSESSMENT 3 Credit Hours**

The course will allow students to develop their understanding and knowledge of exposure assessment methods and the application of these methods to substantive issues in occupational and environmental health. The course emphasizes methodological principles and good practice, and highlights the many similarities and some interesting differences between occupational and environmental health.

Prerequisite: ENV 892 or equivalent introductory environmental health sciences course, BIOS 806 or equivalent introductory biostatistics course, permission of instructor.

Cross List: CPH 594.

Typically Offered: FALL

**ENV 888 PRINCIPLES OF TOXICOLOGY 3 Credit Hours**

An introduction to the principles and methods that are used to determine whether an adverse effect is a result of exposure to a specific agent. A primary purpose of toxicology is to predict human toxicity and human health risk assessment relies heavily on toxicological data obtained from animal studies. This course covers basic mechanisms of toxicity as they pertain to whole organisms, organ systems, and specific toxic agents.

Cross List: CPH 597

Typically Offered: SPRING

**ENV 892 PUBLIC HEALTH ENVIRONMENT & SOCIETY 3 Credit Hours**

An introduction to environmental factors (including biological, physical and chemical factors) that affect the health of a community. The main focus will be the effects of exposures that have been associated with human health and environmental problems in the Midwest, specifically water and air pollutants related to animal feeding operations, arsenic in ground water, pesticides, herbicides, lead and radiation. The effects of global warming, ergonomic problems in the meat packing industry and occupational and environmental problems in health care will also be discussed.

Cross List: CPH 503.

Typically Offered: FALL

**ENV 896 RESEARCH OTHER THAN THESIS ENVIRONMENTAL, AGRICULTURAL AND OCCUPATIONAL HEALTH 1-4 Credit Hours**

This course is for more advanced students who wish to pursue their research interests in selected areas of Environmental, Agricultural Occupational Health

Cross List: CPH 617.

Typically Offered: FALL/SP/SU

**ENV 898 SPECIAL TOPICS IN ENVIRONMENTAL, AGRICULTURAL AND OCCUPATIONAL HEALTH 1-4 Credit Hours**

A course designed for Masters students that focuses on selected topics or problems in Environmental, Agricultural, and Occupational Health.

Cross List: CPH 619

Typically Offered: FALL/SP/SU

**ENV 900 ADVANCED EXPOSURE ASSESSMENT 3 Credit Hours**

This doctoral level course provides an in-depth examination into advanced exposure assessment methods and their implications for environmental, occupational, and agricultural health. Throughout the course, students will assess exposure pathways, apply sampling techniques, conduct exposure assessments, and analyze data to address the impact of exposures on population health. The course will enable students to develop practical and hands-on lab skills to conduct exposure assessments, analyze data, interpret health outcomes, and communicate findings to diverse audiences.

Prerequisite: CPH 594/ENV 816 Environmental Exposure Assessment or equivalent course; PhD student status or instructor permission

Instructor: Matthew W. Nonnenmann

Typically Offered: FALL/SPR

**ENV 901 ENVIRONMENTAL, AGRICULTURAL AND OCCUPATIONAL HEALTH DATA: METHODS AND APPLICATIONS 3 Credit Hours**

This course prepares the graduate student with the skills needed to understand, apply, analyze, and interpret data to address complex challenges in the occupational, agricultural, and environmental health fields. Students will explore methods, statistical modeling approaches, analysis planning, data visualization, and interpretation throughout this course. Major topics include formulating research questions, designing studies, planning for and conducting analyses, and communicating data findings to diverse audiences.

Prerequisite: CPH 504 Epidemiology in Public Health and CPH 506 Biostatistics or equivalent; DrPH or PhD student status or instructor permission.

Typically Offered: SPRING

**ENV 902 DOCTORAL SPECIAL TOPICS 1-4 Credit Hours**

A course designed for PhD students in Environmental, Agricultural, and Occupational Health and other graduate students that focuses on selected topics or problems in Environmental, Agricultural, and Occupational Health. ζ

Prerequisite: Permission of instructor.

Typically Offered: FALL/SP/SU

**ENV 903 INJURY EPIDEMIOLOGY 3 Credit Hours**

In this course, students will learn about the incidence, characteristics, risk factors, populations at risk, control measures, and research methods related to injuries. The course includes lectures and presentations by faculty and students. Students will apply this knowledge throughout the course by completing assignments, analyzing data, and preparing a manuscript for publication in a peer-reviewed journal. The primary target audience for this course is doctoral students interested in injury and illness epidemiology. Pre-req: ENV 892, EPI 845, BIOS 810

Instructor: Risto Rautiainen , PhD Lorena Baccagliani, PhD, DDS, MS, NE-CPhT

Typically Offered: FALL

**ENV 904 ENVIRONMENTAL, AGRICULTURAL, AND OCCUPATIONAL POLICY 3 Credit Hours**

In this course graduate students will explore environmental, agricultural, and occupational health policy. Throughout the semester, students will apply conceptual frameworks of national, state, and local action to health issues such as air pollution, wildlife, toxic substances, pesticide exposure, respiratory problems, work-related stress, and chemical exposure to provide a critical view of the historical development of key environmental policies. Additionally, students will examine how environmental, agricultural, and occupational policy is made and carried out by a diverse set of individuals, groups, and interests, including policy formation and implementation and how it becomes a process of bargaining and negotiation, controlled partly by the character of the participants and partly by the nature of the arenas in which action takes place. Pre-reqs: PhD student status or instructor permission.

Typically Offered: FALL

**ENV 905 CLIMATE CHANGE AND HUMAN HEALTH 3 Credit Hours**

This course is designed for doctoral students in environmental health who have an interest in climate change. Any graduate student with an interest in climate change may take this course. This course explores the science of climate change. Students will learn how the climate system works, the use of models, observations and theory to make predictions about future climate, and the connection between human activity and the current warming trend. The course also explores strategies to communicate the science of climate change to diverse stakeholders. Prerequisite: ENV 892, EPI 845, BIOS 808; or instructor permission  
Cross List: CPH 720  
Typically Offered: FALL

**ENV 906 ENVIRONMENTAL, AGRICULTURAL, AND OCCUPATIONAL HEALTH FUNDING STRATEGIES: FROM CONCEPT TO PROPOSAL 3 Credit Hours**

This doctoral-level course will prepare students with the knowledge and skills to develop and write a research plan that contributes to the advancement of environmental, agricultural, and occupational health (EAOH) sciences through contracts and funded research. Students will generate evidence-based solutions utilizing diverse methodologies to create funding proposals for contracts and awards geared towards EAOH funding mechanisms (NSF, NOAA, NASA, CDC, DOD, USDA, etc.). Major topics include critically reviewing EAOH contracts and funding proposals, identifying and selecting funding mechanisms, managing projects, creating research teams, and effectively communicating with participants involved in the proposal preparation process. The fundamentals of contract and funding proposal writing are covered, including the abstract, literature review, background, specific aims, significance, innovation, methods, timeline, budget, bio sketches, and resources. Prerequisite: PhD student status or instructor permission.  
Instructor: Risto Rautiainen, PhD (instructor), JoEllyn McMillan, PhD (co-instructor)  
Typically Offered: FALL/SPR

**ENV 907 LEGAL FRAMEWORKS: ENVIRONMENTAL, AGRICULTURAL, AND OCCUPATIONAL HEALTH 3 Credit Hours**

This doctoral-level course explores the legal frameworks impacting environmental, agricultural, and occupational health (EAOH). Throughout the course, students will develop a comprehensive understanding of the legal landscape, including the creation of laws and regulations and understanding how court decisions affect policy and practice in EAOH. Major topics include the United States legal systems, international laws and their intersection with US law, and occupational, agricultural, and environmental health regulations. The litigation process, the role of expert witnesses, federal agencies overseeing environmental, agricultural, and occupational health, and exploring lobbying and advocacy efforts will also be covered. Prerequisite: PhD student status or instructor permission.  
Typically Offered: FALL/SPR

**ENV 908 THERMAL STRESS IN THE WORK ENVIRONMENT 3 Credit Hours**

In this course, students will learn about the health effects, measurement, and control of health and cold stress in the work environment, and emerging technology related to smart clothes and wearable technology. Students will also learn how to develop a thermal stress program. The targeted audience will include doctoral students interested in occupational health, and professional students. Prerequisite: ENV 892; ENV 816  
Typically Offered: SUMMER

**ENV 909 OCCUPATIONAL NOISE EXPOSURE AND HEARING LOSS 3 Credit Hours**

In this course, students will learn about the health effects, measurement, and control of occupational noise exposure, and emerging technology related to smart phones and wearable technology. Students will also learn how to provide hearing tests, read audiograms, and perform fit testing of ear plugs. The targeted audience includes doctoral students interested in occupational health, professional students, and nursing students. Upon completion of this course, students may take an external examination administered by the Council for the Accreditation of Occupational Hearing Conversationists (CAOHC) to earn the credential of "Certified Occupational Hearing Conservationist (COHC)." Prerequisite: ENV 892; BIOS 806  
Typically Offered: SPRING

**ENV 911 COMMUNICATION FOR PUBLIC HEALTH LEADERS 3 Credit Hours**

Decision making and communication in a crisis can make or break a public health response. Improving the quality of decisions and risk communication can save lives. In this course, students will learn how, as public health leaders, to effectively communicate what is known and unknown in and about any public health crisis or situation. Students will build the skills needed to be trusted public health messengers of information, including inclusive messaging by understating cultural context, health literacy, and the value of humility, will be covered. The course discusses risk perception, communication guidance, and news media portrayal of risks - all critical components of behavioral and psychological factors affecting health-related behaviors. Additionally, the course will guide students on practical tools around how to communicate with the media and policymakers and persuasive communication. Prerequisite: CPH 500/HPRO 830 Foundations of Public Health; DrPH or PhD student status or instructor permission.  
Cross List: CPH 711  
Instructor: Lauren Sauer; Nicole Kolm Valdivia  
Typically Offered: SPRING

**ENV 912 RISK ASSESSMENT AND TOXICOLOGY 3 Credit Hours**

Human health risk assessment is the process of analyzing information to determine whether an environmental hazard might cause harm to exposed persons. This course is designed for doctoral students interested in the environment and toxicology. It is open to any graduate or professional student. Major topics to be covered include the EPA risk assessment model, and risk assessment of air, water, and food pollutants. Pre-reqs: ENV 892, ENV 888  
Typically Offered: FALL

**ENV 913 ENVIRONMENTAL PATHOLOGY 3 Credit Hours**

This course will enable students to understand the impact of environmental exposures on the organ and tissue injury responsible for human disease. The environmental exposures covered in the course will consist of the subject areas of air pollution, pneumoconiosis, chemical and drug exposures, and physical agents. The course will cover all aspects of environmentally-induced disease symptom manifestation, corresponding pathology and histology characterizing injury and repair, and the molecular, biochemical, and cellular mechanisms responsible for environmental exposure-mediated injury. This course will accent, but not overlap, the mechanisms of toxicology learned in other courses by expanding the student's knowledge of how these exposures injure the body leading to disease. The course is designed for doctoral students in Environmental and Occupational Health and Toxicology. This course may also be of interest to doctoral students in Pathology. Pre-req: ENV 892, ENV 888  
Typically Offered: SPRING

**ENV 914 CHEMICAL CARCINOGENESIS 3 Credit Hours**

This course is designed to prepare the graduate student, professional student, or fellow to evaluate the effects of chemical carcinogens, and conduct cancer-related research. Major topics to be covered include chemical carcinogens, multistep carcinogenesis, biomonitoring of human exposure, and chemoprevention of cancer. In this course students will learn about the characteristics of chemical carcinogens, how they cause cancer, the role of oxidative stress and other biological factors in carcinogenesis, various model systems for investigating carcinogens. Strategies to prevent cancer by chemoprevention will also be discussed. This course will provide students with tools to evaluate environmental carcinogens, conduct research to understand their action and/or explore chemoprevention of various types of cancer.

Prerequisite: ENV 888 or equivalent.

Typically Offered: SPRING

**ENV 950 ADVANCED TOXICOLOGY 3 Credit Hours**

This course deals with the adverse effects of chemicals on biological systems. Physiological and biochemical mechanisms of toxicity at the cellular and subcellular levels will be emphasized.

Prerequisite: Permission of instructor and ENV 888 or equivalent.

Cross List: PHSC 950

Typically Offered: FALL

**ENV 970 SEMINAR 1 Credit Hour**

Attendance at weekly seminars offered by the department/program, or other activities specific to the degree program (contact the program director for more information).

Typically Offered: FALL/SPR

**ENV 996 DIRECTED READINGS AND RESEARCH 1-9 Credit Hours**

This course is specific to doctoral level work in the College of Public Health. Content of this independent study may include research other than dissertation, directed readings, and other study of a doctoral level all under the supervision of a graduate faculty member.

Prerequisite: Doctoral student status and program permission.

Typically Offered: FALL/SP/SU

**ENV 999 DOCTORAL DISSERTATION 1-6 Credit Hours**

Independent student research related to the PhD dissertation. This course may be utilized before or after successful completion of the comprehensive exam.

Prerequisite: must be ENV graduate student

Typically Offered: FALL/SP/SU