

A minimum of **15** credits are required for completion, and **nine** of which must be earned in courses numbered 500 and above. **Nine** credits must be graded. The overlap of coursework applied toward both the graduate certificate program and a graduate degree program must **not exceed six credits** and is **limited to elective coursework** in each program at the University of Washington.

Successful completion of a Graduate Certificate Program requires a minimum cumulative GPA of 3.0 for courses required for the Certificate and a grade of 2.7 or higher for each course counted toward the certificate.

Students enrolled in the Advanced Practice Environmental and Occupational Health (APEOH) Graduate Certificate Program are expected to discuss their course plan with their certificate faculty advisor at the beginning of the program. Quarterly update from the student and advising meeting are required.

For the APEOH students on the Northwest Education and Research Center (ERC) Training Grant, courses with an asterisk (\*) are in the "Work and Health" graduate certificate curriculum that was approved by the National Institute for Occupational Safety and Health (NIOSH), and courses with two asterisks are required for the trainees.

## **CORE COURSES**

Students are required to take at least one course from each of the following two categories (Nursing Science and Public Health Science); and a minimum of 6 credits between the two.

### **Nursing Science:**

#### **\*\*NSG 554 Population Health and the Environment (3)**

Introduces core concepts and principles related to the science and practice of environmental and occupational health. Examines historical cases and current issues to illustrate how environmental conditions contribute to injury and illness among human populations. Explores health professionals' roles in actions that protect and promote healthy environmental and workplace settings. Offered: Sp.

#### **NSG 558 Occupational Health Nursing: Advanced Practice and Leadership in Program Development (3)**

Examination of advanced professional practice and leadership in the context of occupational health and safety programs. Focuses on assessment, development, implementation, and evaluation of programs involving workplace health surveillance, case management, workers' compensation, and health promotion in consideration of political, economic, legal, ethical issues, and application of current research.

#### **NSG 572 Collaborating for Health Equity (3)**

Evaluates models and approaches to effective collaboration with communities and other stakeholders toward advancing health equity. Emphasizes application of cultural humility in working across sectors, leveraging existing assets and other resources, and developing collective impact. Develops approaches to build community and organizational capacity, rectify power asymmetries, and institutionalize supportive practices for sustainment. Prerequisite: NSG 571. Offered: A.

#### **NSG 573 Systems Thinking for Population Health (3)**

Develops systems-level thinking with emphasis on identifying, analyzing, and addressing factors relevant to improving population health. Reviews theories focused on approaches and actions to affect change for the utilization and delivery of health promoting services. Emphasis on developing a theory of action and multicultural considerations to transform the health status of underserved and marginalized communities. Prerequisite: either EPI 511; NSG 572; and NMETH 536, or permission of instructor. Offered: W.

### **Public Health Science:**

#### **ENV H 510 Global Environmental and Occupational Health (4)**

Provides an overview of environmental and occupational health, with major focus on developing countries. Examines a variety of environmental hazards and influential factors, interactions with human health and well-being, and relevance to public health. Considers workplace, community, home, regional, and global problems. Offered: SP.

#### **ENV H 514 Fundamentals of Toxicology (3)**

Covers major fundamentals and core areas of toxicology, including dose response, absorption, distribution, metabolism, and

excretion of toxicants, toxicity testing, interpretation of toxicological data; and biochemical, cellular, and physiological mechanisms by which chemicals produce toxic responses. Also explores mechanisms and fate of chemical interaction with biological systems. Prerequisite: BIOL 212, BIOC 405, or permission of instructor. Offered: A.

**\*\*ENV H 550 Occupational and Environmental Disease (3 or 4)**

A case-based introduction to occupational and environmental diseases, focusing on disease epidemiology, pathophysiology, diagnostic testing basics, and aspects of population management such as disease surveillance, policy development, and health protection programs. A four credit option offered to clinically-oriented students additionally covers diagnostic test interpretation, differential diagnosis, and clinical management. Offered: ASP.

**EPI 511 Introduction to Epidemiology (4)**

Epidemiologic methods for non-epidemiology majors. Focuses on research designs and methods to describe distribution and determinants of disease and health events in populations; uses quantitative and biomedical information to infer whether causal relationships exist between potential causes and disease in populations. Offered: A.

**EPI 512 Epidemiologic Methods I (4)**

Considers principles and methods of epidemiology. Covers measures of disease frequency, descriptive epidemiology, overview of study designs, measures of excess risk, causal inference, screening, measurement error, misclassification, effect modification, and confounding. First in a two course sequence. Prerequisite: BIOST 511, which may be taken concurrently, or equivalent. Offered: A.

**EPI 513 Epidemiologic Methods II (4)**

Considers how epidemiologic studies may be designed to maximize etiologic inference. Covers infectious disease epidemiologic studies, randomized controlled trials, cohort studies, case-control studies, cross-sectional studies, ecological and multilevel studies, and selected topics such as meta-analysis. Second in a two course sequence. Prerequisite: EPI 512. Offered: W.

**EPI 520 Epidemiology of Infectious Diseases (3)**

Focuses on infectious diseases from a public health perspective. Uses domestic and international case studies to apply traditional and contemporary epidemiologic principles and methods to infectious disease research and public health practice. Specific topics include: surveillance, program evaluation, outbreak investigation, transmission dynamics, and mathematical modeling. Prerequisite: either EPI 511, EPI 512, or permission of instructor.

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## SELECTED ELECTIVE COURSES

Students are required to take a minimum of 2 courses (and a minimum of 6 credits) of elective courses selected from the following list:

**SCHOO OF NURSING (UWS)**

**NSG 554 Population Health and the Environment (3)**

Introduces core concepts and principles related to the science and practice of environmental and occupational health. Examines historical cases and current issues to illustrate how environmental conditions contribute to injury and illness among human populations. Explores health professionals' roles in actions that protect and promote healthy environmental and workplace settings. Offered: Sp.

**NSG 574 Program Development and Evaluation to Improve Population Health (4)**

Steps in developing population health interventions and programs, including assessment, prioritization, planning, and evaluation. Appraise best practices and evidence to inform the execution of strategies that improve health. Makes use of reliable data sources and stakeholder engagement, while considering ethical, political, and socio-cultural contexts. Prerequisite: either EPI 511, NSG 572, NMETH 536, or permission of instructor. Offered: W.

**\*NSG 558 Occupational Health Nursing: Advanced Practice and Leadership in Program Development (3)**

Examination of advanced professional practice and leadership in the context of occupational health and safety programs. Focuses on assessment, development, implementation, and evaluation of programs involving workplace health surveillance, case management, workers' compensation, and health promotion in consideration of political, economic, legal, ethical issues, and application of current research.

**NSG 575 Leadership for Population Health (3)**

Analyzes and applies leadership literature and models for advanced nursing practice in population health. Explores skills in

organizational strategic planning and change, with emphasis on roles and responsibilities in advocacy, workforce development, operational management of organizations, and professional ethics. Emphasis on transforming organizations, communities, systems, and other contexts to advance the health of all populations. Prerequisite: NSG 571, or permission of instructor. Offered: Sp.

**NURS 580 Current Issues in Occupational and Environmental Medicine (2, max. 12)**

Interdisciplinary seminar on current and emerging topics in the practice of environmental and occupational health. Faculty- and student-led presentations with an interdisciplinary focus, including occupational hygiene, nursing, and medical issues.

Prerequisite: environmental health graduate student, occupational health nursing student, or permission of instructor. Offered: jointly with ENV H 596; AWSp.

**NURS 561 Selected Topics in Comparative Nursing Care Systems (2/3, max. 10)**

In-depth examination of the literature pertinent to major theoretical issues in cross-cultural nursing and healthcare systems.

Seminar with analysis and discussion of selected topics and readings. Implications for research and healthcare stressed. [Topics could vary at each time the course is offered. Only topics relevant to APEOH can be considered toward the program requirement.]

**NURSING (UWB)**

**B NURS 597 Selected Topics in Nursing (1-5, max. 15)**

Course content and credits vary depending upon topic. [Topics could vary at each time the course is offered. Only topics relevant to APEOH can be considered toward the program requirement.]

**NURSING (UWT)**

**T NURS 590 Special Topics in Nursing (2-3, max. 9)**

Analyzes current research, issues, and application of selected topics in nursing; may have clinical component. Emphasizes implications for nursing and health care. [Topics could vary at each time the course is offered. Only topics relevant to APEOH can be considered toward the program requirement.]

**SCHOOL OF PUBLIC HEALTH (UWS)**

**\*ENV H 453 Industrial Hygiene (3)**

Introduction to the principles and scientific foundation of industrial hygiene. Examines the anticipation, recognition, evaluation, and control of work place hazards to health and safety. Focuses on the first three functions, but includes some consideration of control methods. Offered: A.

**ENV H 514 Fundamentals of Toxicology (3)**

Covers major fundamentals and core areas of toxicology, including dose response, absorption, distribution, metabolism, and excretion of toxicants, toxicity testing, interpretation of toxicological data; and biochemical, cellular, and physiological mechanisms by which chemicals produce toxic responses. Also explores mechanisms and fate of chemical interaction with biological systems. Prerequisite: BIOL 212, BIOC 405, or permission of instructor. Offered: A.

**ENV H 515 Organ System Toxicology (3) T. KAVANAGH**

Focuses on organ system toxicology. Emphasizes the pathophysiology of toxicant-induced organ injury, including adaptive responses to toxicant exposure, inflammation, and tissue repair pathways. Prerequisite: ENV H 514 or permission of instructor. Offered: W.

**ENV H 516 Toxic Agents: Effects and Mechanisms (3)**

Focuses on the toxic effects and the underlying mechanisms of the principal classes of toxicants: pesticides, metals, solvents, air pollutants, persistent organic pollutants, radiation, as well as on food safety and occupational/clinical/eco toxicology. Prerequisite: ENV H 515 or permission of instructor. Offered: Sp.

**ENV H 518 Understanding and Managing the Health Risks of Climate Change (3)**

The health risks of climate change are multiple and range across the public health space. Addresses current and projected health risks of climate change and the policies and measures to manage these risks as the climate continues to change. Offered: jointly with G H 518; W.

**ENV H 521 Effective Communication Strategies for Environmental Public Health Professionals (2)**

Introduces students to the science of and best practices in science communication. Covers how and why to use narrative structure, how to identify and emphasize important messages, how to influence behavioral change, identifying common mistakes in messaging, and how to interact with the media. Prepares students to present at conferences, interact with the

media, engage with diverse communities, and write high impact papers and competitive grants. Credit/no-credit only. Offered: Sp.

**ENV H 536 Health Impact Assessment (2)**

Examines the use of Health Impact Assessment as a public health tool for informing decision-makers about the potential health impacts of proposed projects and policies. Students learn the steps for conducting HIAs, review case studies, and conduct an HIA of a current local proposed project. Offered: jointly with URBDP 536 in Sp

**ENV H 538 Public Health and the Built Environment (2)**

Examines how the design of communities and land use and transportation decision have positive and adverse effects on health. Considers built environment impacts on physical activity, obesity, air quality, injuries, mental health, social capital, and environmental justice; and explores interventions to promote healthy community design. Offered: jointly with URBDP 538 in W.

**ENV H 539 One Health: Human and Animal Health in a Changing Environment (3)**

Case based exploration of the One Health concept, connecting human, animal, and environmental health. Topics include emerging zoonotic infectious diseases transmitted between humans and animals, animals as sentinels of environmental hazards, the human-animal bond, and the comparison of spontaneous diseases between human and animals. Includes two optional field trips. Offered: SP.

**ENV H 545 Water, Wastewater, and Health (4)**

Review of water supply, water quality, and water/wastewater treatment as they relate to human health. Includes water law and regulations, source water protection, basic treatment technologies for water and waste, chemical and microbial contaminants, and recreational water. Offered: A.

**ENV H 546 Hazardous Waste and Public Health (3)**

Characterization of hazardous wastes and introduction to pertinent federal and state regulations. Discussion of exposure pathways and description of management options at pre-generation, pre-release, and post-release stages. Emphasis on public health significance. Supplemented with case studies. Offered: W.

**ENV H 547 Environmental Change and Infectious Disease (3) G. CANGELOSI**

Uses multidisciplinary approach to address the impacts of environmental change (including climate change) on infectious disease. Concepts include categories of environmental change; infectious disease emergence/re-emergence; environmental aspects of infectious disease exposure, acquisition, and progression; pathogen growth/survival in the environment; historical and societal perspectives; surveillance; and strategies for control. Offered: Sp.

**ENV H 548 Community Air Pollution (3)**

Offers a comprehensive overview of community air pollution including: air pollution sources, chemistry, and meteorology; human health and environmental effects; global warming; air quality standards, monitoring, control, and management; indoor air; and local air quality management. Prerequisite: SPH graduate student or permission. Offered: Sp.

**\*ENV H 560 Occupational Safety Management (4)**

Explores industrial organization and methods of integrating safety and industrial hygiene programs with industrial operations. Investigates philosophic issues related to industrial safety and health such as responsibility for safety, dependency on safe practice, and hierarchy of prevention. Contains numerous case problems and student involvement opportunities. Offered: jointly with NSG 506; W.

**\*ENV H 562 Technical Aspects of Occupational Safety (3)**

Reviews federal OSHA (Occupational Safety and Health Administration) and state WISHA (Washington Industrial Safety and Health Act) standards. Explores the impact of these regulations on industry, particularly construction. Upon completion of the course, student receive an OSHA 510 30-hour Construction Safety and Health certificate. Offered: jointly with NSG 507; Sp.

**\*\*ENV H 564 Recognition of Health and Safety Problems in Industry (2)**

Develops skills in occupational health and safety hazard recognition in a variety of important Northwest industries. Focuses on process understanding and hazard recognition skills during walk-through inspections of several local facilities, stressing a multidisciplinary approach. Offered: jointly with IND E 564; A.

**ENV H 577 Risk Assessment for Environmental Health Hazards (4)**

Examines context, methodologies, data, uncertainties, and institutional arrangements for risk assessment. Qualitative and quantitative approaches to identification, characterization, and control of environmental hazards to health emphasized through didactic and case studies. Offered: jointly with CEWA 560/PUBPOL 589; A.

**ENV H 580 Environmental and Occupational Health Sciences Seminar (1, max. 21)**

Presentation of current environmental and occupational health research and issues. Credit/no-credit only. Offered: AWSp.

**\*ENV H 584 Environmental Health Policy and Practice (4)**

Explores how environmental health problems are controlled in the United States by examining the policies and practices of environmental health. Covers how various government programs are established, organized, and operated to prevent or control hazards in the community, and the legal and regulatory framework behind them. Offered: A.

**ENV H 590 Selected Topics (1-6, max. 20)**

In-depth study of a current environmental health topic. [Students can consider registering for this course when the course offered focuses on healthcare clinical aspects of EOH.]

**ENV H 596 Current Issues in Occupational and Environmental Medicine (2/4, max. 12)**

Interdisciplinary seminar on current and emerging topics in the practice of environmental and occupational health. Faculty- and student-led presentations with an interdisciplinary focus, including occupational hygiene, nursing, and medical issues. Offered: jointly with NURS 580; SpS.

**\*ENV H 597 Case Studies in Environmental and Occupational Health (1, max. 12)**

Discusses clinical cases, recent journal articles, and global environmental health scenarios relevant to the clinical practice of environmental and occupational health. Explores collaborative management of environmental and occupational health-related illnesses and navigation of complex environmental health scenarios through real-world cases and critical analysis of published literature. Offered: AWSp.

**\*HSERV 581 Strategies of Health Promotion (4)**

Assessment of health promotion planning, implementation, and evaluation strategies for their strengths, weaknesses, and effectiveness. Students critique strategies to modify behavioral factors that influence lifestyles of individuals, including decisions influencing their reciprocal relationship with environmental factors affecting the health of individuals, organizations, and communities.

**COLLEGE OF BUILT ENVIRONMENTS (UWS)****B E 552 Theories of Knowledge and the Built Environment (3)**

Systematic examination of alternative epistemological frameworks applicable to studying the built environment; examinations of their differences and similarities and of the possibility of a comprehensive, pluralistic approach.

**\*CM 598 Special Topics: Data-Driven Health and Safety for Construction (3 cr).** This data-driven, health and safety research training capstone course aims to engage students in a miniature scale but holistic research-to-practice experience on the development, study and application of appropriate measurements as they serve as critical and potential construction health and safety hazard indicators. The NORA Construction Sector Strategic Goals from NIOSH is consulted to identify major construction hazards and introduce concepts, techniques, analysis and interpretation of measurements related to these hazards. Some of the major areas of study include introduction and case studies on the cycle of research to practice; sources and effects of presented major construction health and safety hazards; construction health and safety hazard measurements and indicators; engineering control or human factor related interventions; Total Worker Health; and discussions on future monitoring and evaluation implications.

**URBDP 536 Health Impact Assessment (2)**

Examines the use of Health Impact Assessment as a public health tool for informing decision-makers about the potential health impacts of proposed projects and policies. Students learn the steps for conducting HIAs, review case studies, and conduct an HIA of a current local proposed project. Offered: jointly with ENV H 536.

**URBDP 538 Public Health and the Built Environment (2)**

Examines how the design of communities and land use and transportation decision have positive and adverse effects on health. Considers built environment impacts on physical activity, obesity, air quality, injuries, mental health, social capital, and environmental justice; and explores interventions to promote healthy community design. Offered: jointly with ENV H 538.

**COLLEGE OF THE ENVIRONMENT (UWS)****C ENV 500 Communicating Science to the Public Effectively (3)**

Teaches emerging scientists how to effectively communicate their research to the public. Uses lessons and tools such as group discussion, feedback, and practice. Credit/no-credit only. Offered: W.

**\*ENVIR 585 Climate Impacts on the Pacific Northwest (4)** *Mantua, Snover*

Knowledge of past/future patterns of climate to improve Pacific Northwest resource management. Topics include the predictability of natural/human-caused climate changes; past societal reactions to climate impacts on water, fish, forest, and coastal resources; how climate and public policies interact to affect ecosystems and society. Offered: jointly with ATM S 585/ESS 585/SMEA 585; Sp.

**COLLEGE OF ENGINEERING (UWS)**

**CEWA 555 Topics in Environmental Health (3)**

Introduction to human biology, including physiology, epidemiology, and toxicology. Study of contemporary environmental health problems and practices as they relate to radiological health, solid-waste disposal, occupational health, biometeorology, and bioengineering.

**CEWA 560 Risk Assessment for Environmental Health Hazards (4)**

Examines context, methodologies, data, uncertainties, and institutional arrangements for risk assessment. Qualitative and quantitative approaches to identification, characterization, and control of environmental hazards to health emphasized through didactic and case studies. Offered: jointly with ENV H 577/PUBPOL 589; A.

**COLLEGE OF ARTS AND SCIENCES (UWS)**

**GEOG 560 Principles of GIS Mapping (5)**

Origins, development, and methods of cartographic mapping. Principles of data representation and map design for thematic mapping and spatial analysis. Introduction of principles of geographic information systems (GIS).

**GEOG 561 Urban Geographic Information Systems (5)** *Elwood, Nyerges*

Uses geographic information systems to investigate urban/regional issues, including transportation, land use, environment, emergency response, and public health. Spatial data acquisition, structuring, management, and analysis in a GIS environment - for urban planning, government, and research applications. Prerequisite: minimum grade of 2.0 in GEOG 560 or permission of instructor. Offered: W.

**DANIEL J. EVANS SCHOOL OF PUBLIC POLICY AND GOVERNANCE (UWS)**

**PUBPOL 547 Water Resource Economics (4)**

Explores the economics of water resources, including static and dynamic efficiency for consumers and producers and other topics concerned with water quality. Explores effects of climate change on water resources, and economic approaches to mitigate these effects.

**PUBPOL 582 Communicating Climate Change (4)**

Surveys climate change communications and the role in achieving climate change policy goals. Assesses climate change communication in light of scientific evidence as well as student reactions. Explores theories and frameworks to evaluate and improve climate change communications. Examines the role of climate change communication as a policy tool.

**PUBPOL 589 Risk Environmental Risk for Environmental Health Hazards (4)**

Examines context, methodologies, data, uncertainties, and institutional arrangements for risk assessment. Qualitative and quantitative approaches to identification, characterization, and control of environmental hazards to health emphasized through didactic and case studies. Offered: jointly with CEWA 560/ENV H 577; A.

**PUBPOL 590 Environmental Policy (4)**

Presents background to establish the need for environmental policy. Explores in a comparative manner, examining both successes and failures, various strategies that have been used or proposed to protect the environment. Explores different policy tools for environmental protection, including command-and-control regulation, market-based incentives, third-party certifications, and collaborative partnerships.

**PUBPOL 593 Climate Change and Energy Policy (4)**

Energy policy formulation and implementation with emphasis on post-1973 developments. Energy conservation programs; changing roles of oil, coal, gas, nuclear, and solar energy; institutional, environmental, and equity considerations; government research and development programs.

**PUBPOL 594 Economic Approaches to Environmental Management (4)**

Examines the economic tools relevant to natural resource and environmental management. Tools are developed in the context of a series of resource problems, with an eye towards building intuition useful for addressing complex policy problems that do

not fit neatly into textbook examples. Prerequisite: PUBPOL 516; PUBPOL 517; PUBPOL 527; PUBPOL 528

**PUBPOL 596 Environmental Risks and Values (4)**

Explores a range of sources of risk to human health and the environment, and the values that color communication, perception, and decision making about risk. This topic lies at the core of an ongoing conversation between communities, governments, scientists, the media, and others. Topics include energy, climate, water supply, emerging technology, and environmental justice.

**PUBPOL 597 Environmental Decision Analysis (4)**

Examines how science contributes to decisions that involve the natural environment; how science and scientists help frame debates and decisions; how scientific findings are incorporated into decision-making processes; how scientists and non-scientists deal with uncertainty about scientific questions.

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## **CAPSTONE EXPERIENCE**

Students will also complete a capstone experience of 3 or more credits involving mentored research or a clinical experience that is negotiated between the student and his/her certificate faculty advisor. Students will register for NMETH 600 if it is a mentored research or NCLIN 599 if it is a mentored clinical experience. Students will work with the certificate faculty advisor to complete the NMETH 600 form or NCLIN 599 form to detail the plan.