

PUBLIC HEALTH— ENVIRONMENTAL AND GLOBAL HEALTH

PHC 6018 Environmental Ecology of Human Pathogens 3 Credits

Grading Scheme: Letter Grade

This course covers major topic areas concerning ecological relationships of environmental pathogens that cause diseases in humans. The course will discuss environmental reservoirs of human pathogens and introduces microbiological techniques necessary to detect and identify the variety of pathogens present in the environment.

Prerequisite: PHC 6313 or permission of the instructor.

PHC 6037 Public Health Virology 3 Credits

Grading Scheme: Letter Grade

Students will learn and explore key concepts of animal virology with a focus on viruses that have worldwide public health importance. Topics include understanding, analyzing, and applying knowledge gained about virus genomes and structure, mechanisms of pathophysiology, transmission and risk factors, vaccine development and efficacy, and mitigation strategies.

Prerequisite: Two semesters of General Biology (i.e. BSC 2005) and/or microbiology (i.e. MCB 3023). Email the instructor for evaluation of prerequisite coursework.

PHC 6046 Foundations of Environmental Epidemiology Methods 3 Credits

Grading Scheme: Letter Grade

Students will gain a working knowledge of epidemiologic methods for assessing health effects of environmental exposures. Students will gain foundational environmental epidemiology research skills for specific types of environmental exposures in the following areas: evaluating literature and causal evidence, creating a study design, and performing an environmental epidemiological analysis.

Prerequisite: PHC 6001 Principles of Epidemiology in Public Health or with instructor permission.

PHC 6301 Aquatic Systems and Environmental Health 3 Credits

Grading Scheme: Letter Grade

Physical and chemical nature of water, effects of contaminant and other stressors in different aquatic ecosystems. Taxonomic and ecological summary of aquatic biota, from algae and invertebrates to vertebrates and pathogens.

Prerequisite: PHC 6313

PHC 6304 Environmental Toxicology Applications in Public Health 3 Credits

Grading Scheme: Letter Grade

Environmental toxicology examines exposure to chemical, biological, and physical agents and associated health effects in humans and wildlife. Students will analyze environmental fate of chemicals, exposure routes, mechanisms of toxicity, and critique common approaches used by public health professional when dealing with toxicants.

Prerequisite: BSC 2010, CHM 2045 preferred but not required.

PHC 6326 Environmental and One Health 3 Credits

Grading Scheme: Letter Grade

Many health challenges face complex and inextricable links between human, animal, and environmental health, necessitating a systems approach to One Health. This course introduces concepts, theories, and applications of environmental health sciences in the context of one health. The course combines lectures, discussions, and a class project.

Prerequisite: BSC 2005, or EVS 3000, or consent of the instructor.

PHC 6424 Environmental Policy and Risk Management in Public Health 3 Credits

Grading Scheme: Letter Grade

Provides students with an in depth understanding of the government's environmental health structure, environmental policy making processes, important environmental policies, and application of these policies through risk assessment and management techniques to protect the public and the environment.

Prerequisite: PHC 6313.

PHC 6445 Global Public Health and Development II 3 Credits

Grading Scheme: Letter Grade

Second in series of two global public health and development courses created specifically for the new Master's in Development Practice (MDP) program. Practical approaches for identification, design, planning, monitoring, and evaluation of global public health interventions in their broader development context.

Prerequisite: PHC 6764

PHC 6446 Systems Thinking in One Health 3 Credits

Grading Scheme: Letter Grade

The course is designed for students with diverse backgrounds who intend to expand their knowledge in One Health vision. Students will be exposed to a variety of lectures, which will be delivered by experts on specific topics related to One health. Lectures will be complemented with One Health convergence dialogues.

PHC 6512 Environmental Management of Vector-Borne Diseases 3 Credits

Grading Scheme: Letter Grade

Planning, organization, implementation, and monitoring the activities for control of environmental factors or their interaction with man to prevent or minimize vector propagation and man-vector-pathogen contact.

PHC 6515 One Health: Applied Techniques in Public Health Entomology 3 Credits

Grading Scheme: Letter Grade

This course introduces students to basic applied field techniques in the study of medical entomology and vector borne diseases. Students will learn about the entomology techniques used for collection and analysis the samples to understand vector borne disease transmission.

Prerequisite: General microbiology, principles of infectious diseases, or epidemiology of infectious diseases.

PHC 6520 Foodborne Diseases 3 Credits

Grading Scheme: Letter Grade

Discussing major pathogens associated with foodborne diseases, their epidemiology, and approaches to outbreak investigation and control of foodborn illness. Teaching/learning methods include lectures, case studies, readings, and an individual project.

Prerequisite: PHC 6001 Principles of Epidemiology

PHC 6671 Emerging Infectious Diseases in One Health 3 Credits**Grading Scheme:** Letter Grade

Applies One Health (the intersection of animal and human health and the environment) to understand the emergence of disease-causing microbes and the critical drivers of microbial evolution. Extensive discussion of the global emergence of new infectious disease agents and how factors within One Health influence microbial evolution and disease emergence.

Prerequisite: MCB 3020; MCB 3023; MCB 4203; MCB 4304 or by permission of the instructor.

PHC 6702 Environmental Monitoring and Exposure Assessment 3 Credits**Grading Scheme:** Letter Grade

Exposure to hazardous chemical, physical and biological agents occurs through inhalation, ingestion, or contact with a variety of environmental media including air, water, food, or soil. Students will acquire and apply the key knowledge needed to perform environmental monitoring for exposure assessment in environmental health research and practice.

Prerequisite: at least one undergraduate course in biostatistics or statistics. ;

Corequisite: access to a computer with Excel, SPSS, or SAS.

PHC 6706 Scientific Communication in Public Health 3 Credits**Grading Scheme:** Letter Grade

Scientific communication skills are critical to public health researchers and allied professionals. Multiple outreach approaches will be used to develop and deliver meaningful content targeted for different audience perspectives. The course consists of lectures, student presentation opportunities and intensive constructive critique.

Prerequisite: Current good standing in public health graduate program or permission of instructor.

PHC 6715 Public Health Research Methods 3 Credits**Grading Scheme:** Letter Grade

Provides students with fundamental principles of research methodologies relevant to public health research. We will review a range of methodologies, including randomized controlled trials, observational studies, mixed-method and experimental approaches to develop enhanced capacity to critically appraise data from scientific studies.

Prerequisite: PHC 6050 or PHC 6052 or PHC 6001 or permission from instructor.

PHC 6722 Environmental and Global Health Research Methods Rotation 1-4 Credits**Grading Scheme:** Letter Grade

Providing opportunities for PhD students to gain first-hand experience observing the implementation of research methods needed to employ during the course of their dissertation research. Upon completion, students will be required to write a detailed report of the experience.

PHC 6764 Global Public Health and Development I 3 Credits**Grading Scheme:** Letter Grade

First in series of two global public health and development courses. Public health and anthropologic principles, methods, and study designs.

PHC 6900 Environmental and Global Health Journal Club 1 Credit**Grading Scheme:** Letter Grade

Provides students with fundamental skills for reading, understanding, and critically analyzing scientific research papers in environmental and global health. Students choose a paper and present the results of the scientific study to the class. Thus, both critical thinking and public speaking skills are developed through this course.

PHC 6937 Special Topics in Public Health 1-6 Credits, Max 6 Credits**Grading Scheme:** Letter Grade

Special Topics in Public Health

PHC 6947 Environmental and Global Health Capstone Experience 3-5 Credits**Grading Scheme:** Letter Grade

Provides an opportunity for Master of Health Science (MHS) in One Health students to work in a public health, occupational health, agricultural health, or similar setting. The Capstone experience requires that each student develop a research project with the guidance of their advisor.

Prerequisite: PHC 6001 Principles of Epidemiology in Public Health.

PHC 7307 Quantitative Assessment of Environmental Health Impacts 3 Credits**Grading Scheme:** Letter Grade

Introduces applied modeling of environmental health impact assessment for graduate students and health professionals by focusing on burden of diseases, transmission and control of environmentally-mediated infectious pathogens through the use of statistical and mathematical tools.

Prerequisite: PHC 6313 and PHC 6050

PHC 7738C Physiologically Based Pharmacokinetic Modeling in Toxicology and Risk Assessment 3 Credits**Grading Scheme:** Letter Grade

Discusses the fundamental principles, software, methodology and applications of physiologically based pharmacokinetic (PBPK) modeling in toxicology and human health risk assessment of environmental chemicals. Students will also learn how to integrate machine learning and artificial intelligence approaches with PBPK modeling to support PBPK model development and applications.

Prerequisite: One semester of pharmacokinetics (e.g., PHA 6125 Introduction to Quantitative Pharmacology or PHA 6131 Physiologically-Based Modeling), toxicology (e.g., PHC 6304 Environmental Toxicology Applications in PH) or with permission from the instructor

PHC 7935 Critical Thinking in Environmental and Global Health 1 Credit**Grading Scheme:** Letter Grade

Providing students with the critical thinking and integrative skills necessary to understand contemporary environmental health problems, critically understand the existing literature, develop research and assessment questions, and identify appropriate methodological tools to address the questions. The course is offered as a weekly seminar that revolves around a focal reading, followed by additional background reading and discussion.

Prerequisite: PHC 6313 Environmental Health Concepts in Public Health and PHC 6702 Exposure Measurement and Assessment

PHC 7979 Advanced Research 1-12 Credits**Grading Scheme:** S/U

Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy.

PHC 7980 Research for Doctoral Dissertation 1-15 Credits, Max 15 Credits**Grading Scheme:** S/U

Research for Doctoral Dissertation