

PUBLIC HEALTH—GENERAL

PHC 2100 Introduction to Public Health 3 Credits

Grading Scheme: Letter Grade

Overview of public health as a multifaceted field. Includes discussion of contemporary public health challenges with input from discipline experts.

Attributes: General Education - Social Science

PHC 3440 Global Public Health 3 Credits

Grading Scheme: Letter Grade

Critical links between global health and social and economic development. Discusses the burden of disease and how to measure this across countries. Focuses on low and middle income countries and the health of the poor.

Prerequisite: PHC 4101 & PHC 3603 both with a minimum grade of C & (PBH_BPH major or (PBH_UMN minor)).

PHC 3603 Critical Issues in Ph 3 Credits

Grading Scheme: Letter Grade

Critical Issues in Ph

Prerequisite: PHC 4101 with a minimum grade of C & (PBH_BPH major or (PBH_UMN minor)).

PHC 4024 Applied Epidemiology 3 Credits

Grading Scheme: Letter Grade

Principles and methods of epidemiological investigation focusing on both infectious and noninfectious diseases. Emphasizes outbreak investigations, field epidemiology and epidemiology careers.

Prerequisite: PHC 4101 & PHC 4094 both with a minimum grade of C & (PBH_BPH major or PBH_UMN minor).

PHC 4031 One Health and Emerging Infectious Diseases 3 Credits

Grading Scheme: Letter Grade

A pivotal elective in the One Health Program and the Bachelors of Public Health degree; introduces the concept of One Health in the context of how disease-causing microbes or pathogens emerge and the critical drivers of microbial evolution.

Prerequisite: Gen Ed Biology; academic level junior, senior and graduate or instructor approval

PHC 4094 Introduction to Biostatistics for Health Science and Public Health 3 Credits

Grading Scheme: Letter Grade

Methods and public health applications for analysis of variance, correlation, simple linear regression, multiple linear regression, nonparametric and distribution-free statistical methods, and some basic concepts about survival analysis. Public health applications using statistical software. Writing data analysis reports.

Prerequisite: PHC 4101 & STA 2023 both with a minimum grade of C & (PBH_BPH major or PBH_UMN minor).

PHC 4101 Public Health Concepts 3 Credits

Grading Scheme: Letter Grade

Introduces the basic tenets, applications and foci of public health, including integrating public health with other health professions.

Prerequisite: Sophomore standing and PSY 2012 with a minimum grade of C & STA 2023 with a minimum grade of C & (HES_BHS or PBH_BPH or CSD_BHS major or (PBH_UMN minor)).

PHC 4117 Public Health Management Leadership 3 Credits

Grading Scheme: Letter Grade

Provides knowledge relevant to leading public health organizations while effectively managing and motivating employees. Includes organizational behavior and theories to examine management, leadership, and application of skills in delivering public health programs.

Prerequisite: HSA 3111 and PHC4101 with a minimum grade of C and PBH_BPH major or HSA 3111 with a minimum grade of C and HAD_UMN minor.

PHC 4320 Environmental Concepts in Public Health 3 Credits

Grading Scheme: Letter Grade

Surveys major environmental health topics by examining sources, routes, media, and health outcomes associated with biological, chemical, and physical agents in the environment. Introduces the economic and legal frameworks associated with environmental health issues and public health.

Prerequisite: PHC 4101 with a minimum grade of C & (PBH_BPH major or (PBH_UMN minor)).

PHC 4930 Special Topics in Public Health 1-6 Credits

Grading Scheme: S/U

Exploration of a general or a specific area of public health.

Prerequisite: junior or senior standing.

PHC 4943 Service Learning Practicum 3 Credits

Grading Scheme: Letter Grade

Covers development of the role of a public health and human services provider in an agency setting.

Prerequisite: PHC 4101 & PHC 4320 & PHC 4024 & HSA 3111 all with a minimum grade of C & (PBH_BPH major) & senior standing.

PHC 6000 Epidemiology Methods I 3 Credits

Grading Scheme: Letter Grade

Overview of epidemiology methods used in research studies that address disease patterns in community- and clinic-based populations.

Prerequisite: PHC 6001, PHC 6050 or PHC 6052, or departmental approval.

PHC 6001 Principles of Epidemiology in Public Health 3 Credits

Grading Scheme: Letter Grade

Epidemiology methods frequently used to study disease patterns in community and clinic-based populations. Includes distribution and determinants of health-related states or events in specific populations and application to control of health problems.

PHC 6002 Epidemiology of Infectious Diseases 3 Credits

Grading Scheme: Letter Grade

Epidemiology, prevention, and control of infectious diseases affecting local, national, and global community health; epidemiologic methods used in disease surveillance and measures used in slowing or preventing spread of disease.

Prerequisite: PHC6001 or its equivalent and PHC6050 or PHC 6052 or equivalent or PHC6740 & PHC6741-L..

PHC 6003 Epidemiology of Chronic Diseases and Disability 3 Credits

Grading Scheme: Letter Grade

Overview of epidemiology of chronic diseases and disabilities prevalent in various populations. Introduces contemporary methods for surveillance including risk factors, etiology, and changes over time.

Prerequisite: PHC 6001, and PHC 6052 or PHC 6050 or departmental approval.

PHC 6009 Biology and Epidemiology of HIV/AIDS 3 Credits**Grading Scheme:** Letter Grade

Examining the biological process by which HIV causes infection and AIDS, including the physiologic and cellular processes involved in HIV infection and treatment. Developing skills in finding and interpreting current epidemiologic data on HIV/AIDS, including risk factors, comorbid health issues, special populations, and health outcomes. Overview of HIV prevention strategies and their effectiveness. Special emphasis on epidemiology of HIV/AIDS in the rural south.

PHC 6011 Epidemiology Methods II 3 Credits**Grading Scheme:** Letter Grade

Analytic methods in epidemiology with a foundation in applied epidemiological analysis and experience in peer-review productivity based on secondary data analysis.

Prerequisite: PHC 6000 & PHC 6052 & PHC 6053, or approval of instructor

PHC 6016 Social Epidemiology in Public Health 3 Credits**Grading Scheme:** Letter Grade

Social determinants of population health, including acute and chronic disease outcomes, and health behavior. Introduces methodological approaches to the field of social epidemiology with specific attention to measurement issues.

Prerequisite: PHC 6000, PHC 6001, PHC 6410, or consent of instructor.

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 6020 Clinical Trial Methods 3 Credits**Grading Scheme:** Letter Grade

Basic statistical concepts and methods used in clinical trials and the statistical principles and methods including phase I to IV clinical trials.

Prerequisite: STA 6208/STA 6209, STA 6326/STA 6327, or equivalent

PHC 6022 Design and Conduct of Clinical Trials 3 Credits**Grading Scheme:** Letter Grade

Scientific evaluation of health care interventions by clinical trials and the ethics, principles, and conduct of clinical trials in an epidemiological context. Complex issues in analyzing and interpreting clinical trials.

Prerequisite: STA 2023 (Introduction to Statistics I) or equivalent, and permission of the instructors. Students are expected to have basic statistical knowledge.

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 6041 Landmarks in Psychiatric Epidemiology 2 Credits**Grading Scheme:** S/U

Landmarks in psychiatric epidemiology, including mental health and substance use disorders, are reviewed with emphasis on student discovery. The focus is on findings, methodology, and historical development of methods in case finding and diagnosis; cohort discovery; and geographical, social, and community risk factors. Topics include relevance to current methodological challenges.

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 6050 Statistical Methods for Health Sciences Research I 3 Credits**Grading Scheme:** Letter Grade

Appropriate use of data summarization and presentation of basic statistical methods, including ANOVA, nonparametric methods, inference on discrete data, inference on survival data, and regression methods for continuous, binary, and survival data. SPSS statistical software. Required core course for students in public health management and policy and social and behavioral science concentrations.

PHC 6050C Biostatistical Methods I 3 Credits**Grading Scheme:** Letter Grade

Biostatistical data analysis using linear models; theory and practice of regression and analysis of variance in the health sciences.

Prerequisite: basic knowledge of data analysis, linear algebra, and calculus III, and consent of instructor.

PHC 6051 Biostatistical Methods II 3 Credits**Grading Scheme:** Letter Grade

Biostatistical data analysis using generalized linear models, generalized linear mixed models, semiparametric and nonparametric regression, and neural networks; theory and practice in the health sciences.

Prerequisite: consent of instructor and Biostatistical Methods I.

PHC 6052 Introduction to Biostatistical Methods 3 Credits**Grading Scheme:** Letter Grade

Introduction to the concepts and methods of biostatistical data analysis. Topics include descriptive statistics, probability, standard probability distributions, sampling distributions, point and confidence interval estimation, hypothesis testing, power and sample size estimation, one- and two-sample parametric and non-parametric methods for analyzing continuous or discrete data, and simple linear regression. SAS statistical software for data management, statistical analysis and power calculations. Required core course for students in biostatistics, environmental health, and epidemiology concentrations.

PHC 6053 Regression Methods for the Health and Life Sciences 3 Credits**Grading Scheme:** Letter Grade

Introduction to a wide range of regression methods. Primary topics are multiple linear regression, logistic regression, and Poisson regression.

Prerequisite: PHC 6052 or equivalent. For graduate students in fields other than statistics.

PHC 6059 Introduction to Applied Survival Analysis 3 Credits**Grading Scheme:** Letter Grade

Survival analysis is about the analysis of time-to-event data. The goal of this course is to help you understand the fundamental concepts of survival analysis and their applications in epidemiology and biomedical sciences. Basic concepts from probability and introductory statistics will be reviewed as needed.

Prerequisite: Prior training in statistics (PHC 6052 or equivalent) and knowledge of multiple regression (PHC 6053 or equivalent). R programming experience will also be helpful.

PHC 6063 Biostatistical Consulting 3 Credits**Grading Scheme:** Letter Grade

Providing training for M.S. and Ph.D students in Biostatistics on the statistical aspects of research problems.

Prerequisite: Biostatistical Methods I and II or consent of the instructor. ;

Corequisite: All faculty teaching this course have completed at least 18 graduate semester hours in the teaching discipline and hold at least a master's degree.

PHC 6064 Survey of Advanced Biostatistical Methods for the Health Sciences 3 Credits**Grading Scheme:** Letter Grade

Uniquely blends the fundamentals of biostatistical inference with an introduction to advanced statistical techniques critical for the analysis of the growing compendium of health-related data. Topics span the analysis of high-dimensional, categorical, and longitudinal data from the health sciences. Applications utilize the statistical software packages R and SAS.

Prerequisite: PHC 6052 or permission of instructor.

PHC 6075 Biostatistical Literacy 3 Credits**Grading Scheme:** Letter Grade

Research in the health sciences requires appropriate study design, statistical analysis and interpretation of results. This course introduces basic concepts and techniques, including types of data, inference, and regression, necessary to read, interpret, and critically evaluate statistical results in health science literature relevant to the interests of the student.

Prerequisite: graduate students in the health sciences and requires a basic knowledge of mathematics, including algebra (for example, MAC 1105 and MAC 1114, or MAC 1140, or equivalent).

PHC 6084 Bayesian Biostatistical Methods 3 Credits**Grading Scheme:** Letter Grade

Introduces students to Bayesian statistics with special emphasis on practical implementation in diverse areas such as clinical trials, survival analysis, longitudinal studies, disease mapping, and bioinformatics. Students will be able to fit Bayesian models to analyze real data sets using freely available software such as WinBUGS and R.

Prerequisite: PHC 6092 and PHC 6050C and PHC 6051 or equivalent.

PHC 6088 Statistical Analysis of Genetic Data 3 Credits**Grading Scheme:** Letter Grade

An introduction to statistical procedures for genetic studies. This class will emphasize the statistical theory behind methods for analyzing genetic data and its application in useful software tools. This course prepares students for potential research in statistical genetics but is also open to a wider community. \

Prerequisite: PHC 6092 and PHC 6050C or equivalent. Permission at the discretion of the instructor may be granted if the student is familiar with linear algebra, maximum likelihood, simple hypothesis testing, and linear regression.

PHC 6089 Public Health Computing 3 Credits**Grading Scheme:** Letter Grade

This course covers using SAS and R to manage and analyze public health data. Students will learn how to import, modify, visualize and perform common analyses of public health data using SAS and R.

Prerequisite: PHC 6052 or or approval of the instructor.

PHC 6092 Introduction to Biostatistical Theory 3 Credits**Grading Scheme:** Letter Grade

Concepts and principles of statistical theory, including probability and random variables, parameter estimation, confidence intervals, hypothesis testing, asymptotic analysis, Bayesian inference, statistical decision theory and linear models.

Prerequisite: Multivariable calculus or permission of the instructor.

PHC 6097 Statistical Learning with Applications in Health Sciences 3 Credits**Grading Scheme:** Letter Grade

Covers a broad range of methods that are useful for modern data analysis, specifically in the analysis of high-dimensional data. Many of these methods (e.g., deep learning) go far beyond the classical statistical methods and are developed for addressing various problems (e.g., nonlinearity) we encounter in real situations.

Prerequisite: PHC 6068 and PHC 6050C and PHC 6051, or the permission of the instructor.

PHC 6099 Programing Basics for Biostatistics 3 Credits**Grading Scheme:** Letter Grade

The Introduction to Biostatistical Computing course is intended to develop your programming skills to perform biostatistical computing. The course will include both R programming language using the RStudio interface and Python programming language using the Anaconda interface. Topics include data structure, file input/output, visualization, data manipulation, basic statistical inference, and reproducible reports using markdown languages.

Prerequisite: An introductory course in statistics that covers inference, such as PHC 6052.

PHC 6103 Systems Thinking for Public Health 3 Credits**Grading Scheme:** Letter Grade

Conceptual and empirical tools for understanding and managing complex organizations and interacting with other large systems that impact public health. Simulated work experiences show intended and unintended consequences of interventions in complex systems.

PHC 6104 Evidence-Based Management of Public Health Programs 3 Credits**Grading Scheme:** Letter Grade

Practical guidance on how to choose, administer, and evaluate evidence-based programs and policies in public health settings.

Prerequisite: PHC 6102 or equivalent.

PHC 6146 Public Health Program Planning and Evaluation 3 Credits**Grading Scheme:** Letter Grade

Second of two courses providing skills to develop and implement public health programs. Focuses on six steps in the rational planning process. Emphasizes evidence-based public health principles, organizational influences, and other contemporary themes of program planning.

PHC 6149 Public Health Leadership 1-2 Credits**Grading Scheme:** Letter Grade

Focuses on leadership and management within the Public Health field. Students acquire knowledge of management and leadership skills to grow as a public health professional, build collaborative professional relationships, develop strategies, and lead public health efforts as a team member and future leader.

Prerequisite: Permission of the Master's of Public Health program.**PHC 6183 Disaster Preparedness and Emergency Response 3 Credits****Grading Scheme:** Letter Grade

Online introduction to disaster preparedness and responding to disasters. Training on the Incident Command System (ICS), the National Incident Management System (NIMS), and the Federal Emergency Management Agency (FEMA) minimum responder credential requirements.

PHC 6193 Qualitative Data Analysis 3 Credits**Grading Scheme:** Letter Grade

Students will work intensively with their own qualitative data with feedback from instructors and classmates. Covers different ways of working with narrative data. Focuses on grant writing and publishing with qualitative research.

Prerequisite: Advanced masters students and PhD students with access to a qualitative data set.**PHC 6194 Spatial Epidemiology 3 Credits****Grading Scheme:** Letter Grade

Spatial Epidemiologic research methods, with major focus on Geographic Information Systems (GIS) and Exploratory Spatial Data Analysis (ESDA) applied to public health issues.

Prerequisite: All of the following courses: PHC 6000 , PHC 6011 , PHC 6052 , PHC 6053 (or equivalent).**PHC 6195 Health information for Diverse Populations: Theory & Methods 3 Credits****Grading Scheme:** Letter Grade

Social and behavioral science is a core area in public health. This is an introductory course that examines basic concepts and social scientific research in persuasive communication to gain an understanding how individuals process and respond to public health information.

Prerequisite: Graduate status or consent of instructor.**PHC 6251 Assessment and Surveillance in Public Health 3 Credits****Grading Scheme:** Letter Grade

Knowledge, skills, and methods for conducting community assessments and surveillance to inform design of social and behavioral interventions.

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 6313 Environmental Health Concepts in Public Health 2-3 Credits****Grading Scheme:** Letter Grade

Survey of major topics in environmental health. Sources, routes, media, and health outcomes associated with toxic agents in the environment. Effects of agents on disease, water and air quality, food safety, and land resources. Current legal framework, policies, and practices.

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 6403 Adolescence, Risk Taking and Health 3 Credits****Grading Scheme:** Letter Grade

Introduction to primary determinants and outcomes associated with adolescent risk behaviors. Emphasis on substance use, sexual behaviors, injury, violence and the interactive nature of risk taking behaviors.

PHC 6404 Gender, Sexuality, and Health 3 Credits**Grading Scheme:** Letter Grade

Survey of the dynamics of sexual health issues through public health and gender health studies. Review of intervention strategies to improve sexual health.

PHC 6405 Theoretical Foundations of Public Health 3 Credits**Grading Scheme:** Letter Grade

Providing an in-depth review of social and behavioral science theories used in public health, includes systems and multi-level perspectives on health behavior. Prepares public health students to satisfy MPH competencies in social and behavioral sciences.

Prerequisite: PHC 6410 or instructor permission.**PHC 6406 Social Stigma and Public Health 3 Credits****Grading Scheme:** Letter Grade

Provides a theoretical and scientific foundation for understanding the relationship between stigma and health. This will include multilevel analysis of different forms of stigma, identifying biosocial mechanisms that link stigma to poor health outcomes, and designing a public health intervention to combat stigma. Engagement with first-person accounts of stigma will supplement a focus on population health.

Prerequisite: Open to graduate-level students in the Public Health and Clinical and Health Psychology programs. Students from other graduate programs require instructor approval.**PHC 6410 Designing & Implementing Public Health Solutions 3 Credits****Grading Scheme:** Letter Grade

Acquire knowledge of behavioral science theories and community mobilization strategies, including how to apply these theories along with evidence and ethics in creating culturally-concordant public health solutions. Identify, prioritize, and adapt evidence-based solutions to develop an intervention rationale, advocacy strategy, and implementation plan for an identified solution.

PHC 6421 Public Health Law and Ethics 3 Credits**Grading Scheme:** Letter Grade

Case study approach to legal foundations of American public health system and legal and ethical issues that arise from balancing individual liberties with the government's interest in protecting all citizens' well-being.

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 6441 Health Disparities in the United States 3 Credits****Grading Scheme:** Letter Grade

Determinants that influence health outcomes of the most disadvantaged populations in the U.S., with special attention to racial, ethnic, and gender status.

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 6447 "Epidemic of Inequality": The Ecology of HIV Across American Communities. 3 Credits**Grading Scheme:** Letter Grade

The causal factors, responses, and outcomes associated with HIV/AIDS in the United States are complex and shaped by social, cultural, and structural contexts that affect prevention and service delivery. This course uses an ecological framework to examine multilevel influences on risk and protective behaviors, HIV testing and disclosure, social support, access to medical and social services, and the development of culturally appropriate interventions.

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 6517 Public Health Concepts in Infectious Diseases 3 Credits****Grading Scheme:** Letter Grade

Topics and methods used in modern infectious disease epidemiology.

Prerequisite: PHC 6001 and PHC 6002.**PHC 6519 Zoonotic Diseases in Humans and Animals 3 Credits****Grading Scheme:** Letter Grade

Introduction of graduate and professional students to major zoonotic diseases in both human and animal presentations. Epidemiology, means of prevention and control, available diagnostics, available treatments, and associated human and animal regulations for each disease. Delivered online in 15 modules.

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 6521 Fundamentals of Public Health Nutrition 3 Credits****Grading Scheme:** Letter Grade

Introduces Public Health Nutrition and the role of the Public Health Nutrition professional. Emphasis will be on definition, identification and prevention of nutrition related disease, and improving health of a population by improving nutrition. Malnutrition, nutritional biochemistry, intervention, and program and policy review will be included.

PHC 6530 Public Health Issues of Mothers and Children 3 Credits**Grading Scheme:** Letter Grade

Maternal and child health problems, specific local, state, and federal programs and policies, health and health care access disparities. Emphasis on importance of evidenced-based public health practice.

PHC 6534 Trauma Informed Approaches for Individuals, Communities, and Public Health 3 Credits**Grading Scheme:** Letter Grade

Provides students (1) an overview of adverse childhood experiences (ACEs) and the trauma-informed approach; (2) the opportunity to design and implement public health interventions to prevent ACEs and treat trauma using the social ecological model; and (4) practical instruction in the grant writing process.

Prerequisite: PHC 6410.**PHC 6591 Maternal and Child Health Epidemiology 3 Credits****Grading Scheme:** Letter Grade

This is a 3-credit course offered on campus to graduate students on the epidemiology of maternal and child health. This course is designed to provide a graduate level understanding of how epidemiological principles can be applied to maternal and child mortality and morbidity.

Prerequisite: PHC 6001 and PHC (or equivalent research methods coursework). Students with no prior instruction in epidemiology but with methodological coursework from another related discipline may be admitted with permission from the instructor.**PHC 6598 Foundations in Precision Medicine: Genetic Epidemiology 1 Credit****Grading Scheme:** Letter Grade

Genetic epidemiology, a rapidly evolving field of research, utilizes specialized molecular and statistical methods to identify genetic factors that might be involved in disease etiology. This course provides an exposure to fundamental concepts, terminologies and principles in human population genetics and molecular biology relevant to understanding genetic epidemiologic approaches.

Prerequisite: Enrollment in the Certificate for Precision Medicine or permission of the instructor

PHC 6600 Foundations of Public Health 0-3 Credits**Grading Scheme:** Letter Grade

Introduces public health and healthcare within the US and globally, emphasizing the effect of positionality and the interconnectedness of population and individual health. Course topics include public health history and impact, the role of ethics and evidence, and the importance of health equity and human rights.

PHC 6601 Professional Series in Public Health 0-1 Credits, Max 1 Credits**Grading Scheme:** S/U

Prepares MPH students for their final semester and post-graduation public health careers through Capstone and Applied Practice Experience preparation, paper and presentation development, Institutional Review Board requirements, interviewing skills, and resume construction.

Rotating professional development series offer insights into various public health fields.

PHC 6605 Social Determinants of Health 3 Credits**Grading Scheme:** Letter Grade

Using established conceptual frameworks on the Social Determinants of Health, students will map the interrelationships among the Social Determinants of Health (SDH) and Health Inequalities (HI) / Health Disparities (HD); and discuss the social origins of illness, disease, and suffering that contribute to HD in people's health.

Prerequisite: PHC 4101 or SYG 2000 or WST 2322 or instructor approval.

PHC 6635 Health, Artificial Intelligence, and Human Values 3 Credits**Grading Scheme:** Letter Grade

Evaluates the use of artificial intelligence in Healthcare, Public Health, and health research. Students will appraise predictive models used for making trustworthy health decisions, addressing ethical factors when using artificial intelligence in health research, and analyzing potential for bias, risk, and social inequity.

Prerequisite: PHC 6052 or equivalent course in statistics.

PHC 6641 Social Stratification & Health 3 Credits**Grading Scheme:** Letter Grade

Explores the extent, the causes, and the consequences of social and economic inequality in the U.S. on health. Examines these topics through the lens of two central concepts in social stratification: social inequality and social mobility, with a particular emphasis on intergenerational patterns of mobility within the U.S. as it relates to health, illness, and well-being. Provides students with an understanding of the following content areas: (1) theoretical foundations for understanding social stratification and health (2) research on social stratification and health and (3) social stratification and the social organization of medical care.

PHC 6643 Applying a One Health Framework to Public Health Issues 3 Credits**Grading Scheme:** Letter Grade

Provide students with critical thinking and integrative skills necessary to understand contemporary One Health problems. In this course, students will learn to apply the multidisciplinary One Health concepts taught in PHC 6326 and PHC 6446 to address wicked problems. Students will learn how multisector collaboration and communication can effectively take place to solve problems using the One Health framework. Furthermore, students will learn to address and overcome the barriers faced in multi-se

Prerequisite: PHC 6326 and PHC 6446 or by permission of the instructor.

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 6700 Social and Behavioral Research Methods 3 Credits**Grading Scheme:** Letter Grade

Research methods and their specific applications to public health issues.

Prerequisite: PHC 6410 and PHC 6740.

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 6704 Community-Based Participatory Research 3 Credits**Grading Scheme:** Letter Grade

This course provides an overview of theories, principles, and strategies associated with Community-Based Participatory Research (CBPR). This course is intended for graduate students and community practitioners interested in adding CBPR to their repertoire of effective approaches to understanding and addressing social and health disparities in public health.

Prerequisite: PHC 6001 or PHC 6410 or equivalent research methods course.

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 6707 Health Research Information and Communicating Science 1 Credit**Grading Scheme:** Letter Grade

Designed to refine knowledge of and facility with concepts, resources, and methods of searching for, assessing, storing, and disseminating health literature and data for quality research, publication, policy formulation, and grant-seeking. It is designed to develop critical thinking about topics including the formation of research questions, evidence, authorship, information resources, tools, and funding sources.

Prerequisite: PHC 6700 Public Health Research Methods OR HSA 7707 HSR Research Methods OR equivalent course.

PHC 6711 Measurement in Epidemiology and Outcomes Research 3 Credits**Grading Scheme:** Letter Grade

Major designs and principles of measurement for epidemiology and health services outcomes research, with emphasis on use of primary data collection.

Prerequisite: PHC 6001 and PHC 6050 or equivalent.**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 6716 Survey Research Methods 3 Credits****Grading Scheme:** Letter Grade

Introduction to population surveys typical in descriptive (surveillance) and analytic epidemiology research.

Prerequisite: PHC 6001, PHC 6050; and STA 6208 or equivalent, or permission of instructor.**PHC 6717 Public Health Surveillance 3 Credits****Grading Scheme:** Letter Grade

The purpose of this course is to prepare master's- and doctoral-level students to be able to design, evaluate, and operate epidemiological surveillance systems, and to be able to critically evaluate surveillance systems and reports.

Prerequisite: PHC 6001 and PHC 6000, or equivalent graduate-level coursework in epidemiologic methods, or instructor permission.**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 6724 Qualitative Research Methods for Public Health and Health Sciences 3 Credits**Grading Scheme:** Letter Grade

Explore and begin to learn qualitative research methods for public health and the health sciences. Students will learn the history, philosophical assumptions and interpretive frameworks, foundations of research design, data collection and data analyses of qualitative research in the health sciences. Students obtain an understanding how qualitative research is used in various fields of study and how to best apply it to public health and the health sciences.

Prerequisite: PHC 6700 or an introductory research methods course.**PHC 6726 Integrated Mixed Methods Research in Epidemiology 3 Credits****Grading Scheme:** Letter Grade

Provides in-depth training on designing and implementing research studies that integrate qualitative and quantitative data in Epidemiology. Through assignments and practical activities, students will learn the strengths and challenges of mixed methods research, develop skills in creating robust research proposals, and explore strategies to effectively combine and analyze diverse data types while avoiding common pitfalls.

Prerequisite: PHC 6001 and PHC 6000 (or equivalent research methods coursework) or with instructor permission.**PHC 6736 Statistical and Computational Analysis of Genomic Data 3 Credits****Grading Scheme:** Letter Grade

Focuses on statistical and computational methods/tools for next-generation sequencing data analysis. Topics include introduction and analysis of DNA-seq, RNA-seq, ChIP-seq, ATAC-seq, and single-cell genomics. In addition, the course will illustrate how to use R/Bioconductor R packages to handle common types of genomic data.

PHC 6740 Public Health Methods I: Quantitative Foundations 3 Credits**Grading Scheme:** Letter Grade

This is the first of two courses that focuses on public health/global health research and practice using quantitative and qualitative methods. This course, taken in conjunction with a lab, focuses on principles of epidemiology and biostatistics, emphasizing application of epidemiological methods, quantitative data collection, and quantitative data analysis and interpretation.

Corequisite: PHC 6741L.**PHC 6741L Public Health Methods Statistical Programming Lab 1 Credit****Grading Scheme:** Letter Grade

Trains students to perform basic exploratory data analysis and biostatistical inference procedures using SAS or R software. This course, taken in conjunction with Public Health Methods I Quantitative Foundations, allows students to apply epidemiological and biostatistical concepts emphasized in both courses. Examples are drawn from public health, clinical, and biomedical settings.

Corequisite: PHC 6740.**PHC 6742 Public Health Methods II: Applications for Practice 3 Credits****Grading Scheme:** Letter Grade

The second of two courses focusing on public health/global health research and practice using quantitative and qualitative methods. This course introduces qualitative and mixed methods and their relevance to rigorous public health research and practice, emphasizing using qualitative methods to conduct needs and capacity assessments within communities and organizations.

Prerequisite: PHC 6740.**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 6790 Biostatistical Methods Using SAS 3 Credits**Grading Scheme:** Letter Grade

This course is to introduce and prepare students for biostatistical computing using the SAS statistical software. It builds on the knowledge obtained in the Biostatistical Methods I and II courses by reinforcing the material and focusing on application within the SAS framework.

Prerequisite: PHC 6050C and PHC 6051, or Instructor determination of equivalent background.**PHC 6791 Data Visualization in the Health Sciences 3 Credits****Grading Scheme:** Letter Grade

Students will learn the foundations of information visualization and sharpen their skills in communicating using health science data. Throughout the semester, we will primarily use R to explore concepts in graphic design, storytelling, data wrangling and plotting, biostatistics, and artificial intelligence as they apply to data-driven communication.

Prerequisite: A course in statistics such as PHC 6052 or equivalent. Some familiarity with R statistical software is recommended but not required.

PHC 6900 Environmental and Global Health Journal Club 0-1 Credits, Max 12 Credits**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 6905 Independent Study 1-6 Credits, Max 6 Credits**Grading Scheme:** Letter Grade

Independent Study

Prerequisite: consent of instructor.**PHC 6912 Special Project: Independent Research 1-9 Credits, Max 9 Credits****Grading Scheme:** Letter Grade

Student must undertake significant responsibility for all or part of a research project of particular interest.

Prerequisite: consent of instructor.**PHC 6917 Supervised Research Project 1-6 Credits, Max 6 Credits****Grading Scheme:** S/U

Supervised Research Project

Prerequisite: consent of instructor.**PHC 6931 Seminar in Environmental and Global Health 1 Credit, Max 12 Credits****Grading Scheme:** S/U

Introduces key interdisciplinary, cross-cutting topics essential to the contemporary practice of public health. Written and oral reports.

PHC 6932 Psychiatric Epidemiology Online Seminar Series 1 Credit**Grading Scheme:** S/U

Epidemiology seminars from the Department of Epidemiology and other epidemiology departments, and associated publications will be used to provide students with an understanding of new developments in the field of epidemiology as applied to psychiatric epidemiology.

PHC 6937 Special Topics in Public Health 1-6 Credits, Max 12 Credits**Grading Scheme:** Letter Grade

Special Topics in Public Health

PHC 6939 CPE Psychiatric Grand Rounds 1 Credit**Grading Scheme:** S/U

World-renowned experts are invited to address a wide spectrum of specialties and sub-specialties and often introduce new and interesting developments. Mental health care professionals and epidemiologists will receive up-to-date information on trends and techniques in psychiatry.

Prerequisite: Enrollment in Certificate in Psychiatric Epidemiology**PHC 6940 Master of Public Health Capstone 2 Credits****Grading Scheme:** S/U

This course serves as the culminating integrative learning experience (ILE) for MPH students. In this course, through completion of ILE (i.e., Capstone Project), students demonstrate a synthesis of foundational and concentration competencies. The project serves as the basis of a formally written report and an oral or poster presentation.

Prerequisite: (PHC 6050 or PHC 6052) and PHC 6001, PHC 6313, HSA 6114, and PHC 6410.**PHC 6941 MPH Applied Practice Experience 1-6 Credits, Max 6 Credits****Grading Scheme:** S/U

The MPH Applied Practice Experience (APE) provides an opportunity for students to work in a public health setting. APE encompasses internship and public health service (PHS) hours. Students in internship work with preceptor supervision to apply public health competencies acquired in the classroom to public health practice through experiential activities.

Prerequisite: (PHC 6050 or PHC 6052) and PHC 6001, PHC 6313, HSA 6114, and PHC 6410.**PHC 6945 Public Health Practicum 1-6 Credits, Max 6 Credits****Grading Scheme:** S/U

Public Health Practicum

Prerequisite: approval of practicum site and consent of instructor.**PHC 6946 Public Health Internship 1-9 Credits, Max 9 Credits****Grading Scheme:** S/U

Fieldwork at approved site. Focus on practical application of skills in student's concentration area.

Prerequisite: consent of instructor.**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 6971 Research for Master's Thesis 1-4 Credits, Max 4 Credits****Grading Scheme:** S/U

The thesis requires the student to formulate a research question, conduct relevant background research, generate hypotheses, gather and analyze appropriate data, interpret and discuss findings, and determine conclusions. Students submit a written thesis consistent with UF requirements, pass an oral defense of their research and submit their work for publication under the direction of a mentor.

Prerequisite: Satisfactory completion of the first semester of coursework and instructor's permission. All Human Subjects Participation/IRB required training must be completed prior to registering for this course.**PHC 6990 Grant Writing and Evaluation in Multidisciplinary Sciences 2 Credits****Grading Scheme:** Letter Grade

Engages students to learn about a range of grant opportunities and funding mechanisms relevant to environmental and public health research. Weekly class meetings cover different mechanical components of grant proposals, differences in funding priorities and types based on agency missions, targeting specific proposal opportunities, and the peer-review process. In-class discussions will focus on grantsmanship, the submission process, and grant review.

Prerequisite: Enrollment in a UF doctoral program or permission of the instructor; and PHC 6052 or equivalent

PHC 7000 Epidemiology Seminar II: Critical Evaluation, Research Proposals, and Methods 2 Credits**Grading Scheme:** Letter Grade

This course is taken in the second year of the epidemiology PhD program curriculum. Seminar series is designed to introduce students to a range of advanced epidemiologic concepts and research methods to help PhD students advance their dissertation ideas and help students obtain skills needed for a PhD in epidemiology.

Prerequisite: PHC 6001 and PHC 6000, one semester of biostatistics, and PhD student status in epidemiology or permission of the instructor

PHC 7007 Cancer Epidemiology 3 Credits**Grading Scheme:** Letter Grade

Providing students with skills to evaluate the burden associated with cancers and develop public health interventions to reduce the burden of cancer worldwide. From the population perspective, the course will familiarize students with exposures associated with cancer risk. Practical applications of genome analysis and phenotypic profiling are included/

Prerequisite: PHC 6001 and PHC 6052 or PHC6740 and PHC6741L.

PHC 7017 Advanced Epidemiologic Methods III 3 Credits**Grading Scheme:** Letter Grade

To expand the methodology inventory by introducing advanced and new statistical and modeling methods to address measurement, descriptive, comparative, associative and causal relations in modern epidemiology.

Prerequisite: GMS 6800, GMS 6810, consent of instructor.

PHC 7038 Psychiatric Epidemiology 3 Credits**Grading Scheme:** Letter Grade

Concepts, history, measures, methods and analytical techniques to study the risks, prevalence and incidence, course, comorbidities, and consequences of major mental disorders, in general and specific populations internationally.

Prerequisite: PHC 6000 and PHC 6011

PHC 7049 Python Coding for Epidemiology 2 Credits**Grading Scheme:** Letter Grade

Introduces Python programming with a focus on statistics and machine learning (ML) applications in public health and epidemiology. Covers Python language basics, including operations, data types, and functions. Students learn how to implement statistical methods (e.g., linear regression and mixed models) and ML approaches (e.g., dimension reduction and random forest) using Python and Python-based packages (i.e., Numpy, Scipy, and Scikit-learn) and their application in epidemiology.

Prerequisite: PHC 6011 & PHC 7083 or instructor permission.

PHC 7056 Analysis of Longitudinal Data 3 Credits**Grading Scheme:** Letter Grade

Likelihood-based and semiparametric methods for longitudinal data.

Methods to deal with missing data in both settings.

Prerequisite: STA 6326, STA 6327 (or equivalent), STA 6207, STA 6208 (or equivalent), and STA 6246 (or equivalent).

PHC 7065 Advanced Skills in Epidemiological Data Management 3 Credits**Grading Scheme:** Letter Grade

Provide SAS and SQL programming skills for managing and analyzing public health data, including survey and electronic health records. Topics include data import/export, descriptive analysis, recoding, missing data handling, data linkage, relational databases, subqueries, macros, do-loops, and arrays.

Prerequisite: PHC 6052 Introduction to Biostatistical Methods and PHC 6000 Epidemiology Methods I, or equivalents, or instructor permission.

PHC 7066 Large Sample Theory 3 Credits**Grading Scheme:** Letter Grade

Detailed introduction to large sample theory and its application in univariate and multivariate parametric and nonparametric estimation.

Prerequisite: STA 6326 and STA 6327 (or equivalent).

PHC 7068 Biostatistical Computing 3 Credits**Grading Scheme:** Letter Grade

In this course, students will learn key algorithms for advanced statistical computing and their applications in biomedical sciences. The course will cover fundamental computational techniques for advanced biostatistical data analysis as well statistical methods for random number generation, convex optimization algorithms, Monte Carlo integration, and stochastic optimization.

Prerequisite: PHC 6092, PHC 6050, and PHC 6051, or permission of the instructor.

PHC 7083 Artificial Intelligence and Data Science for Epidemiology and Population Health 3 Credits**Grading Scheme:** Letter Grade

This computational epidemiology course blends methodological, practical, and translational aspects with emphasis on new data science methods. The course is not intended to provide statistical training, but rather to teach students to recognize suitable computational approaches to handle data. Practice sessions will acquaint students with statistical and machine learning software.

Prerequisite: PHC 6000, and at least one among PHC 6052, PHC 6053, PHC 7065 or PHC 6711 (or equivalent quantitative stats/programming course with permission of instructor).

PHC 7090 Advanced Biostatistical Methods I 3 Credits**Grading Scheme:** Letter Grade

Theory and application for estimation and hypothesis testing for independent data using linear models. Principles of Frequentist and Bayesian estimation and inference. Application using statistical software. Writing data analysis reports.

Prerequisite: PHC 6050, PHC 6051, STA 6326, and STA 6327, or permission of the instructor

PHC 7091 Advanced Biostatistical Methods II 3 Credits**Grading Scheme:** Letter Grade

Theory and application for independent and dependent data using generalized linear models and generalized linear mixed models. Bayesian and Frequentist inference. Application using statistical software. Writing data analysis reports.

Prerequisite: PHC 7090 Advanced Biostatistical Methods I or equivalent

PHC 7095 Advanced Statistical Learning for Biostatistics 3 Credits**Grading Scheme:** Letter Grade

This is an advanced course in statistical learning, which covers a broad range of methods and their applications in high-dimensional data analysis. Many of these methods go far beyond classical statistical methods and are developed for addressing modern problems we encounter in public health and medical science settings.

Prerequisite: PHC 7090 and PHC 7091 or permission of instructor.

PHC 7199 Topics in Precision Medicine and Public Health Informatics 1 Credit**Grading Scheme:** Letter Grade

The course introduces methodological and translational topics in precision medicine and public health informatics and provides knowledge and skills for planning and managing such research.

Prerequisite: Epidemiology Methods I and II and a SAS course, or graduate statistical and quantitative research courses in any relevant department, or permission from the instructor.

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 7427 Ethics in Population Science 2 Credits****Grading Scheme:** S/U

Covering federally mandated topics in the Responsible Conduct of Research: Data Acquisition, Management, Sharing, Ownership; Conflict of Interest/Commitment; Human Subjects; Animal Welfare; Research Misconduct; Publication Practices and Responsible Authorship; Mentor/Trainee Responsibilities; Peer Review; and Collaborative Science. This ethics course is for those enrolled in research intensive graduate programs.

Prerequisite: Advanced degree or PhD candidacy or permission of the instructor.**PHC 7587 Theory Development and Testing in Behavioral & Community Public Health 2 Credits****Grading Scheme:** Letter Grade

The purpose of this class will be allowing students the opportunity to review and orally present on a psychosocial construct that is relevant to their own public health research goals and familiarize students with the process of theory development.

Prerequisite: Doctoral student in Public Health.**PHC 7594 Genetic Epidemiology 3 Credits****Grading Scheme:** Letter Grade

Covers fundamental concepts and principles in genetic epidemiology. At the completion of this course, students are expected to critically discuss literature, design and conduct basic genetic analysis, and interpret research finding. Advanced methods course for PhD program.

Prerequisite: PHC 6000, PHC 6011 (can be taken concurrently), and PHC 6050C. Talk to the instructor for a prerequisite waiver or further information. For PhD students; MS/MPH students may contact the instructor for permission.**PHC 7595 Introduction to Molecular Epidemiology 3 Credits****Grading Scheme:** Letter Grade

Covering the theoretical concepts in molecular epidemiology and use of biomarkers in epidemiologic studies. Class topics include: basics of molecular epidemiology, potential uses and limitations of biomarkers, sample collection and storage, issues in epidemiologic study design and analysis, and discussion of specific research examples involving molecular markers.

Prerequisite: Knowledge of basic concepts in epidemiology and study designs: PHC 6001**PHC 7636 Artificial Intelligence in Environmental and Global Health 3 Credits****Grading Scheme:** Letter Grade

Discusses fundamental principles, methodology and applications of machine learning and artificial intelligence approaches in environmental and global health, including physiologically based pharmacokinetic (PBPK) modeling, quantitative structure-activity relationship (QSAR) modeling for toxicity prediction, air pollution, water pollution, human biomonitoring, infectious disease, antimicrobial resistance, and big data.

Prerequisite: PHC 6304 or PHC 6313 or PHC 6326 or with permission from the instructor.**PHC 7727 Grant Writing for Population Health Research 3 Credits****Grading Scheme:** Letter Grade

This course provides practical instruction in the grant process, with a specific focus on National Institutes of Health (NIH) procedures. It provides the student with experience in writing parts of the grant application and in reviewing other's grant applications. It also contains a Mock Grant Review session to assist students in understanding the process and content of grant review.

Prerequisite: PHC 6011 Epidemiology Methods II**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 7744 Causal Artificial Intelligence for Health Research 3 Credits****Grading Scheme:** Letter Grade

Will cover theoretical and practical approaches related to causal Artificial Intelligence (AI), embedding machine learning with causal inference methods on real-world data, and methodologies for automated causal learning. Health research topics such as target trials and transportability will be taught. The students will learn theory behind causal inference methods applied under different constraints, and how to build predictive models and risk scores utilizing causal AI.

Prerequisite: PHC 6053 or PHC 7065 or GMS 6803 or GMS 6822 or GMS 6856 Introduction or instructor approval.**PHC 7901 Epidemiology Literature Review and Critique (Journal Club) 1 Credit, Max 3 Credits****Grading Scheme:** S/U

Preparing students to perform peer-review and to think critically. In weekly class discussion sessions, students will review peer-reviewed, published research studies that demonstrate innovative or faculty epidemiologic content or methods. Feedback will be given by student peers and faculty.

Prerequisite: PhD candidacy status or permission from the instructor**PHC 7902 Scientific Writing for Peer Reviewed Publications for Population and Public Health Science 3 Credits****Grading Scheme:** Letter Grade

Practice reviewing and critiquing research studies.

Prerequisite: PHC 6000 or graduate-level methods course with instructor approval.**PHC 7907 Social and Behavioral Science Journal Club 1 Credit****Grading Scheme:** Letter Grade

Discussing recent literature from top peer-reviewed journals on specific health behaviors or health outcomes. Students will be presenting 4 journal articles. The purpose is to think about health behaviors or health outcomes from a multidisciplinary perspective.

PHC 7910 International Field Epidemiology 3 Credits**Grading Scheme:** S/U

This is an independent study for a student who wishes to accomplish a primary data collection effort internationally.

Prerequisite: PHC 6011 Epidemiology Methods II

PHC 7916 National Field Epidemiology 1-3 Credits**Grading Scheme:** S/U

This applied epidemiology field experience is designed as an opportunity for doctoral students to integrate their growing expertise in epidemiology in a field research experience among a population in the United States.

Prerequisite: PHC 6011 Epidemiology Methods II

PHC 7918 Epidemiology Independent Study 1-3 Credits, Max 12 Credits**Grading Scheme:** S/U

Independent Study is designed for graduate level students who want to pursue in depth an area of study not provided in regularly offered courses. It can involve independent readings or independent projects under the guidance of a faculty sponsor.

Prerequisite: Consent of faculty member supervising the study.

PHC 7925 Biostatistics Journal Club 1-3 Credits, Max 8 Credits**Grading Scheme:** S/U

Meeting weekly to present, review, and discuss current articles in biostatistics or statistics journals or discipline-specific (e.g. medicine, public health, epidemiology) articles with substantive biostatistical content.

PHC 7934 Seminar I: Epidemiology Past, Present, and Future 2 Credits**Grading Scheme:** Letter Grade

The principal goals of this doctoral seminar include becoming familiar with major programs of research in epidemiology, discussing findings and implications of classic/prominent epidemiologic studies, reviewing the strengths and weakness of major epidemiologic study designs, and applying knowledge of epidemiologic study design to students' formulation of their own research studies.

Prerequisite: PhD standing

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, Max 999 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 999 Credits**Grading Scheme:** S/U

Research for Doctoral Dissertation