

POPULATION HEALTH SCIENCES (POP HLTH)

POP HLTH/C&E SOC 370 – INTRODUCTION TO PUBLIC HEALTH

3 credits.

Introduction to the principles of public health. Using local and global health problems as examples, introduces epidemiology, evidence-based public health practice, evaluation, and communication. Covers the major subject domains of public health including infectious and chronic disease, environmental health, injuries and accidents, and health care systems. Key theoretical models and empirical approaches of public health are discussed.

Requisites: Sophomore standing

Course Designation: Breadth – Either Social Science or Natural Science Level – Intermediate

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2024

Learning Outcomes: 1. Define public health and learn the difference between individual- and population-based strategies for improving health Audience: Undergraduate

2. Understand the 5-step public health approach (define the problem, find the causes, develop effective programs, implement programs, and evaluate impact). Audience: Undergraduate

3. Understand the challenges and opportunities for closing the gap between science and practice, focusing on health equity and social justice Audience: Undergraduate

4. Know the core functions of public health (assessment, policy development, and assurance) and how public health is organized at the local, state, national, and international level. Audience: Undergraduate

POP HLTH/B M I 451 – INTRODUCTION TO SAS PROGRAMMING FOR POPULATION HEALTH

2 credits.

Use of the SAS programming language for the management and analysis of biomedical data.

Requisites: Declared in the Population Health, Epidemiology or Clinical Investigation graduate program.

Course Designation: Grad 50% – Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

POP HLTH/ENVIR ST 471 – INTRODUCTION TO ENVIRONMENTAL HEALTH

3 credits.

Impact of environmental problems on human health; biological hazards to human health from air and water pollution; radiation; pesticides; noise; problems related to food, occupation and environment of the work place; accidents. Physical and chemical factors involved.

Requisites: Junior standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level – Intermediate

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2024

POP HLTH/ENVIR ST 502 – AIR POLLUTION AND HUMAN HEALTH

3 credits.

Toxicologic, controlled and epidemiologic studies on major air pollutants. Overview of study methods, lung physiology and pathology; air pollution sources, types, meteorology, sampling methods, controls and regulations.

Requisites: Junior standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level – Advanced

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Grad 50% – Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

POP HLTH/NURSING 525 – NURSING LEADERSHIP FOR GLOBAL HEALTH

2-3 credits.

Designed to prepare undergraduate and graduate nursing students for leadership in global health (GH) by examining their GH goals in a framework that integrates knowledge from nursing with contemporary GH knowledge. Directed toward improving health of the global population as a whole, the framework addresses health trends, practice frameworks, the ecological model, ethics, nursing leadership roles, concepts of partnership and evidence-based practice.

Requisites: None

Repeatable for Credit: No

Last Taught: Fall 2016

POP HLTH/ECON/PUB AFFR 548 – THE ECONOMICS OF HEALTH CARE

3-4 credits.

Analysis of the health care industry. Markets for hospitals and physicians' care, markets for health manpower, and the role of health insurance.

Requisites: ECON 301, ECON 311, or PUB AFFR 880

Course Designation: Breadth – Social Science

Level – Intermediate

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Grad 50% – Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

POP HLTH/B M I 551 – INTRODUCTION TO BIOSTATISTICS FOR POPULATION HEALTH

3 credits.

Designed for population health researcher. Topics include descriptive statistics, elementary probability, probability distributions, one- and two-sample normal inference (point estimation, hypothesis testing, confidence intervals), power and sample size calculations, one- and two-sample binomial inference, underlying assumptions and diagnostic work.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

POP HLTH/B M I 552 – REGRESSION METHODS FOR POPULATION HEALTH

3 credits.

Introduction to the primary statistical tools used in epidemiology and health services research; multiple linear regression, logistic regression and survival analysis.

Requisites: STAT/B M I 541 or POP HLTH/B M I 551

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

POP HLTH/HIST SCI/MED HIST 553 – INTERNATIONAL HEALTH AND GLOBAL SOCIETY

3 credits.

Major problems in international health from 1750 to the present. Focus on disease epidemiology and ecology; political economy of health; migration; quarantine; race, ethnicity, and health care; international health research; cross-cultural healing; mental and maternal health; growth of international health organizations.

Requisites: Junior standing

Course Designation: Breadth - Either Humanities or Social Science Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2021

POP HLTH/NUTR SCI 621 – INTRODUCTION TO NUTRITIONAL EPIDEMIOLOGY

1 credit.

Techniques used to evaluate relationships of diet to health and disease in human populations; integration of knowledge gained with results of animal and clinical studies toward understanding dietary risk or protective factors for disease. Includes advanced diet assessment and basic epidemiologic approaches.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

POP HLTH/M&ENVTOX/ONCOLOGY/PHM SCI/PHMCOL-M 625 – TOXICOLOGY I

3 credits.

Basic principles of toxicology and biochemical mechanisms of toxicity in mammalian species and man. Correlation between morphological and functional changes caused by toxicants in different organs of the body.

Requisites: (BIOCHEM 501 or 508) and (ANAT&PHY 335, 435, or (BIOCORE 485 and 486)) and PATH 404; or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

POP HLTH/M&ENVTOX/PATH/PHM SCI/PHMCOL-M 626 – TOXICOLOGY II

3 credits.

Survey of the basic methods and fundamental biochemical mechanisms of toxicity. Toxicity in mammalian organ systems, techniques for evaluating toxicity, as well as mechanisms of species specificity, and environmental interactions (with toxicant examples) are presented.

Requisites: POP HLTH/M&ENVTOX/ONCOLOGY/PHM SCI/PHMCOL-M 625

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

POP HLTH/GENETICS/MD GENET 636 – PUBLIC HEALTH GENOMICS

1 credit.

Provides an introduction to public health genomics through a review of fundamental principles of genetics, the use of genetic information in clinical and research settings, and its implications for disease management and prevention, and health promotion. Explores policies that guide public health and discusses current ethical, legal, and social implications of these policies.

Requisites: (Junior standing and ZOOLOGY/BIOLOGY/BOTANY 151) or graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2022

Learning Outcomes: 1. Discuss the impact of genetics on clinical care and public health practice Audience: Both Grad Undergrad

2. Critically discuss genetic/genomic policies and the relevant ethical, legal, and social implications (ELSI) of these policies Audience: Both Grad Undergrad

3. Read, summarize, critique, and relate current news articles to key concepts in public health genomics Audience: Graduate

POP HLTH 640 – FOUNDATIONS IN GLOBAL HEALTH PRACTICE

1 credit.

An interdisciplinary course designed to prepare students for specific global health field experiences.

Requisites: None

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Summer 2021

POP HLTH 644 – INTERDISCIPLINARY PERSPECTIVES ON GLOBAL HEALTH AND DISEASE

1 credit.

Addresses a variety of global health topics through study of a specific country. Consider health data, health systems, historical and cultural information, and concepts of cultural competence and cultural humility.

Requisites: None

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2020

POP HLTH 650 – SPECIAL TOPICS

1-6 credits.

Variable content course.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024

POP HLTH/B M I 651 – ADVANCED REGRESSION METHODS FOR POPULATION HEALTH

3 credits.

Extension of regression analysis to observational data with unequal variance, unequal sampling and propensity weights, clusters and longitudinal measurements, using different variance structures, mixed linear models, generalized linear models and GEE. Matrix notation will be introduced and underlying mathematical and statistical principles will be explained. Examples use data sets from ongoing population health research.

Requisites: POP HLTH/B M I 552

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2023

POP HLTH/B M I 652 – TOPICS IN BIOSTATISTICS FOR EPIDEMIOLOGY

1-3 credits.

Each module will adopt an in-depth focus on a biostatistical method of particular relevance to epidemiology such as measurement error, missing data, intermediate variables, complex study designs, meta-analysis, splines, propensity scores, causal inference, spatial statistics and resampling. One or more modules will be offered every spring semester.

Requisites: POP HLTH/B M I 552

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2015

POP HLTH/B M I 694 – APPLIED BIOMEDICAL INFORMATICS & REAL-WORLD DATA FOR PRECISION MEDICINE & POPULATION HEALTH

2 credits.

Provides an introduction to key concepts, methods, and tools of biomedical and health informatics used in precision medicine and population health, with emphasis on collection, management, and analysis of real-world data.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Learning Outcomes: 1. Demonstrate understanding of biomedical informatics concepts, methods, and tools used in precision medicine and population health. Audience: Graduate

2. Demonstrate understanding of real-world data (patient-generated, clinical, and genomic) and data standards used in biomedical research. Audience: Graduate

3. Demonstrate understanding of FAIR Guiding Principles for scientific data management and stewardship. Audience: Graduate

4. Demonstrate understanding of regulations for using protected health information (PHI) data in health research, and ability to recognize potential ethical and compliance issues. Audience: Graduate

POP HLTH 699 – INDEPENDENT READING

1-5 credits.

To gain additional information on specific research problems or advanced training in the areas covered by department staff.

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024

POP HLTH/ISYE 703 – QUALITY OF HEALTH CARE: EVALUATION AND ASSURANCE

1-3 credits.

Implementation, oversight, and management of quality-oriented activities in health care settings. Overview of current and historical activities, approaches, and issues confronting health care related to quality assessment, assurance, and improvement.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2018

Learning Outcomes: 1. Understand and communicate the conceptualization and measurement of quality of healthcare and patient safety. Audience: Graduate

2. Illustrate basic concepts and methods in quality improvement as applied to current issues in healthcare. Audience: Graduate

3. Demonstrate an understanding of the diverse perspectives that can be used to address quality and safety issues in different healthcare organizations. Audience: Graduate

POP HLTH/MEDICINE/NURSING 705 – SEMINAR IN INTERDISCIPLINARY CLINICAL RESEARCH EVIDENCE

2-3 credits.

Exploration of interdisciplinary clinical research questions including strategies for assessing the evidence and methodology for conducting various types of literature reviews. Emphasizes an interdisciplinary perspective.

Requisites: SOC/POP HLTH 797 and STAT/BMI 542

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Summer 2023

POP HLTH 709 – TRANSLATIONAL AND OUTCOMES RESEARCH IN HEALTH AND HEALTH CARE

3 credits.

Seeks to review the conceptualization of translational and outcomes research in health and health care settings; to illustrate basic concepts and methods in research as applied to current issues in health and health care settings; and to understand the diverse perspectives that can be used to inform translational and outcomes research in different organizations, including those based within communities.

Requisites: Consent of instructor

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

POP HLTH 712 – INTEGRATING MEDICINE AND PUBLIC HEALTH

1 credit.

Provides an introduction to public health and opportunities to meet and discuss key concepts with an exciting variety of physician leaders who have integrated medicine public health in their careers.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

POP HLTH 713 – EPIDEMIOLOGY OF HIV/AIDS

1 credit.

Provides an overview of the AIDS pandemic in the United States and worldwide. Topics covered include a review of the epidemiology of AIDS, the natural history of HIV disease, strategies to prevent and treat HIV, and local and global health impact with a focus on historically significant milestones as well as promising current and future research.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Summer 2019

POP HLTH 718 – PRINCIPLES OF GLOBAL HEALTH CARE SYSTEMS

2 credits.

Addresses and analyzes differences in health status and methods of organizing and providing health services in countries with varying levels of development and types of socio-political systems. Develops an understanding of the various avenues of international cooperation in health.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2020

Learning Outcomes: 1. Describe differences in systems of providing health services among countries at different levels of development and with varying socio-political systems. Audience: Graduate

2. Critically analyze selected global health issues, such as: health and human rights, health disparities, and the global health workforce Audience: Graduate

3. Describe the role of major health organizations. Audience: Graduate

4. Examine and clarify values and ethics in global health issues. Audience: Graduate

POP HLTH 721 – CONSPIRACIES IN PUBLIC HEALTH

2 credits.

Skepticism and conspiracism can be barriers to successful implementation of public health and medical interventions such as vaccination, fluoridation of water, and HIV treatment. Conversations between people with opposing viewpoints, whether face-to-face or via social media, often devolve to disparagement and dismissal. Awareness of or experience with such exchanges causes us to avoid tackling such "hot button" topics with friends, colleagues, and members of our communities. While it is all too easy to believe people who adopt conspiracy theories to be members of the fringe, research has shown that medical conspiracy theories are widely known, broadly endorsed, and highly predictive of many common health behaviors. Prepares health professionals to educate communities about important public health and medical interventions.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Fall 2023**POP HLTH 728 – CLIMATE CHANGE MEDICINE**

2 credits.

Climate change threatens human health through multiple exposure pathways, from heatwaves, storms and air pollution episodes, to influences on infectious diseases, nutrition and mental health. Gain thorough and up to date review of these health links and learn present strategies for preparedness and prevention. Medical students will be introduced to a "Health in all Policies" approach that is essential to optimize the potential for medical interventions to address the health risks from climate change, as well as potential health benefits from mitigating the root causes of climate change.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2024**Learning Outcomes:** 1. Demonstrate key concepts in environmental health risk assessment. Audience: Graduate

2. Recognize the linkages between climate change and human health and well-being, as well as exposure pathways through which impacts occur. Audience: Graduate

3. Learn and recognize the value in using a "Health in all Policies" approach to prevention. Audience: Graduate

4. Recognize the main ways that actions to mitigate climate change has offer large benefits to health, especially in reducing chronic diseases Audience: Graduate

5. Develop effective risk communication strategies related to climate change and health. Audience: Graduate

6. Demonstrate ability to construct a Message Box to effectively prepare for interviews with the media, and to write an effective Op-Ed. Audience: Graduate

POP HLTH 729 – PREPAREDNESS IN PUBLIC HEALTH

2 credits.

Provides an overview of various types of public health emergencies and disasters including the organizations and disciplines that prepare and respond to natural and unnatural emergencies. Gain an understanding of how public health officials, public health practitioners, state and local health department staff, health care personnel and emergency responders plan for and respond to public health emergencies. The role of the physician will specifically be explored.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2020**POP HLTH/ENVIR ST 739 – CLIMATE CHANGE, HUMAN AND PLANETARY HEALTH**

2 credits.

Provide tools to identify and address real-world global environmental health issues, stemming from climate change, habitat destruction leading to disease spillover events, food insecurity, and urban design.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2024**Learning Outcomes:** 1. Recognize unique environmental public health challenges posed by climate change. Audience: Graduate

2. Define the planetary boundaries and describe their links to human health. Audience: Graduate

3. Define and Understand the Planetary Health framework and principles for systems-based approaches to risk management and health promotion. Audience: Graduate

4. Learn and apply a Health in All Policies strategy to demonstrate the value of more comprehensive, cross-sector disease prevention programs. Audience: Graduate

5. Critically analyze the linkages between physical and ecological conditions with human health and well-being, as well as exposure pathways through which impacts occur. Audience: Graduate

6. Develop and exhibit effective risk and/or science communication strategies related to environmental health. Audience: Graduate

POP HLTH 750 – CANCER EPIDEMIOLOGY

3 credits.

Covers current knowledge on cancer occurrence and control in human populations. Design and analysis approaches appropriate for cancer epidemiology will also be discussed. Familiarity with basic biological and epidemiologic concepts is desirable.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

Learning Outcomes: 1. Identify the unequal burden of cancer among populations and variations across time and geography. Audience: Graduate

2. Describe the distinctive features of the biology of cancer and carcinogenesis that have implications for epidemiologic research. Audience: Graduate

3. Demonstrate knowledge about the major determinants for several common and emerging cancer sites, both for risk and survivorship. Audience: Graduate

4. Critique epidemiologic study designs for strengths and weaknesses in answering research questions related to cancer risk and survivorship. Audience: Graduate

POP HLTH 752 – PRINCIPLES OF POPULATION HEALTH: DETERMINANTS OF HEALTH AND HEALTH DISPARITIES

2 credits.

An introduction to the field of "Population Health Science" - the multidisciplinary study of why populations are healthy (or not) and how our limited resources can be allocated across the multiple determinants of health to improve population health.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Learning Outcomes: 1. Apply principles of population health sciences to understand the multiple determinants of health and what it means for such determinants to produce health and health disparities. Audience: Graduate

2. Apply principles of population health sciences to understand the optimal allocation of resources across health determinants for the improvement of health and reduction of health disparities and to understand how such resource allocation relates to fundamental economic principles. Audience: Graduate

3. Apply principles of population health sciences to understand the roles of socioeconomic status, behavior, medical care, and community on the production of health at individual and population levels and to appreciate the broad range of social determinants of health. Audience: Graduate

4. Demonstrate understanding of the different ways in which individual health and population health are conceived and measured, and how particular subpopulations often have special health considerations. Audience: Graduate

POP HLTH 753 – PRINCIPLES OF POPULATION HEALTH: POPULATION HEALTH AND HEALTHCARE SYSTEMS

2 credits.

Considers the roles of healthcare systems in improving population health, focusing on the importance of considering healthcare as one among multiple determinants of health.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Learning Outcomes: 1. Apply principles of population health sciences to understand the major dilemmas and tradeoffs involved in attempts to improve healthcare delivery, utilization, outcomes, and quality. Audience: Graduate

2. Apply principles of population health sciences to understand the role of health care as one of many determinants of population health Audience: Graduate

3. Apply principles of population health sciences to understand how efficient delivery of healthcare services is hindered by different forms of market failure and how the attainment of value-based cost-effective health care depends on the reimbursement and insurance incentives designed to encourage it. Audience: Graduate

4. Demonstrate understanding of policy and program evaluation and its role in research dissemination, and understanding of the use and misuse of data in the development of evidence health policy. Audience: Graduate

POP HLTH 784 – PUBLIC HEALTH SURVEILLANCE AND ANALYTICS

3 credits.

Learn applied techniques for community health assessment and surveillance. Population health data (including census, natality, mortality, hospital discharge, behavioral risk factor) are retrieved for analysis and interpretation.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2020

Learning Outcomes: 1. Understand the purpose and role of monitoring population health. Audience: Graduate

2. Name, describe in detail and use some of the existing data systems that are used to monitor population health in Wisconsin, the U.S. and globally. Audience: Graduate

3. Understand and use methods for gathering and analyzing existing population health data. Audience: Graduate

4. Complete and present a final project and brief report to monitor a health priority. Audience: Graduate

POP HLTH/M&ENVTOX 789 – PRINCIPLES OF ENVIRONMENTAL HEALTH: A SYSTEMS THINKING APPROACH

3 credits.

Provides an overview of the field of environmental health, using a systems thinking approach. Systems thinking recognizes that environmental health problem solving is complex and that solutions in one area may have positive or negative impacts on other areas. An introduction to the history of environmental health within the field of public health from the local to the federal and global level. Introduces multiple disciplines, methods and approaches to numerous environmental health topics. Includes introduction to methods and tools necessary for assessing human health risks from a variety of environmental hazards and exposures found in air, land, and water with a focus on physical and chemical risks. Additional details regarding specific hazard, exposure and health outcome data and their relationship to environmental health risk assessment, environmental health decision-making and management form a public health practice perspective will be discussed.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2019

POP HLTH/KINES 791 – PHYSICAL ACTIVITY EPIDEMIOLOGY

3 credits.

Recommendations for and surveillance of physical activity in the U.S., and associations with health and disease at the population level. Emphasis on measurement techniques, study design and research considerations.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

Learning Outcomes: 1. Identify the strengths and weaknesses of epidemiological study designs and critical issues in the analysis of physical activity-related research. Audience: Graduate

2. Compare and contrast the specific measurement tools used in physical activity surveillance and research and identify the errors associated with these tools. Audience: Graduate

3. Identify current public health recommendations for physical activity and describe how they have evolved. Audience: Graduate

4. Describe the contemporary trends in physical activity in the United States and know how they have been measured. Audience: Graduate

5. Identify the relationships between physical activity and various health conditions/diseases. Audience: Graduate

6. Review and analyze the epidemiologic evidence for a link between physical activity and a specified outcome of interest (e.g. physical activity and depression), and present a review of the evidence Audience: Graduate

POP HLTH 794 – BIOLOGICAL BASIS OF POPULATION HEALTH

2 credits.

Covers the physiology, biology and biochemistry of selected disease processes deemed to be important in population health sciences by virtue of their clinical significance including incidence, mortality and morbidity.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2019

POP HLTH 795 – PRINCIPLES OF POPULATION HEALTH SCIENCES

1-3 credits.

Introduction to multiple determinants of health including medical care, socioeconomic status, the physical environment and individual behavior, and their interactions. Also covered will be the definition and measurement of population health, economic concepts in population health, and ethical and managerial issues in population health improvement.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

POP HLTH 796 – INTRODUCTION TO HEALTH SERVICES RESEARCH

3 credits.

Introduces students to a variety of perspectives, substantive areas and methodological approaches to health services research that provide the foundation for understanding the structure, process and outcomes of the U.S. health care system.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

POP HLTH/SOC 797 – INTRODUCTION TO EPIDEMIOLOGY

3 credits.

Design, implementation and interpretation of epidemiologic studies; emphasis on methodologic problems in the measurement of disease frequency, natural history and risk factors.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

POP HLTH 798 – EPIDEMIOLOGIC METHODS

3 credits.

The main emphasis is the design and interpretation of epidemiologic studies. Includes hands-on experience in the evaluation of epidemiologic evidence, the analysis of epidemiologic data, and the discussion of strategies aimed to improve study validity and efficiency.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

POP HLTH 801 – EPIDEMIOLOGY OF INFECTIOUS DISEASES

3 credits.

Introduces basic methods to studying the epidemiology of infectious diseases and reviews infectious diseases of major public health importance. Covers the basics of microbiology, immunology, and laboratory-based methods and the principles of disease surveillance, outbreak investigation, mathematical models of disease transmission, and prevention strategies. The etiology, epidemiology, prevention, and treatment of ancient, modern, and emerging infectious diseases will be examined.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

POP HLTH 805 – ADVANCED EPIDEMIOLOGY: CAUSAL INFERENCE IN EPIDEMIOLOGICAL STUDIES

3 credits.

Focuses on the use of viewpoints and design/analytical tools to render possible the estimation of causal effects in epidemiologic studies. Students learn about the rationale and use of study designs/analytic tools that build upon but are substantially different from the most common approaches used in epidemiologic research (experimental studies, case-control studies, and cohort studies).

Requisites: SOC/POP HLTH 797 and POP HLTH 798

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

POP HLTH 806 – ADVANCED EPIDEMIOLOGY: PRACTICE OF EPIDEMIOLOGY

3 credits.

Apply and extend methodologic knowledge learned in prior courses in the Population Health Sciences epidemiology methods sequence to selected key activities of a practicing epidemiologic researcher, including: study implementation; scientific writing and presentation; manuscript and grant peer-reviewing; measurement validation, simulation studies and sensitivity analyses; and, commonly-used epidemiology field instruments and methods.

Requisites: SOC/POP HLTH 797 and POP HLTH 798

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

Learning Outcomes: 1. Participate in a multi-disciplinary team to design and implement epidemiology studies Audience: Graduate

2. Design and interpret epidemiology validation studies Audience: Graduate

3. Identify commonly-used epidemiology field instruments and methods for assessing a wide range of specific health factors Audience: Graduate

4. Write clear and concise research articles Audience: Graduate

5. Contribute to scientific dissemination as peer reviewers Audience: Graduate

POP HLTH/OBS&GYN 807 – REPRODUCTIVE AND PERINATAL EPIDEMIOLOGY

2 credits.

Provides an overview of the current knowledge and research in reproductive and perinatal epidemiology. Through reading of the primary and secondary literature, examine issues related to topics such as fertility, preconception health, and perinatal outcomes including maternal morbidity and mortality, pregnancy loss, and infant outcomes. Current evidence-based strategies designed to improve reproductive and perinatal outcomes are reviewed. Long-term health implications of pregnancy and infant health are considered.

Requisites: SOC/POP HLTH 797

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

POP HLTH 810 – GLOBAL HEALTH EPIDEMIOLOGY

2 credits.

Explores the relationship between globalization and health and provides an understanding of: (a) indicators and determinants of health and health disparities across populations, from less to more developed countries; (b) the application of epidemiology to evaluate population health, identify global public health priorities, monitor progress toward public health goals, and develop and evaluate interventions to improve global health and reduce health disparities; and (c) some practical and ethical considerations in global health research. Exposure to the "One Health" perspective and to research and clinical work of University of Wisconsin-Madison faculty members working in the field of global health epidemiology, and is designed to identify ways that epidemiology can contribute to improvements in global health.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2021

Learning Outcomes: 1. Identify, critically evaluate and use global health data and indicators to describe global public health priorities and disparities and monitor trends and progress; and, Audience: Graduate

2. Describe the role of epidemiology and the application of epidemiologic principles in studies to improve population health and reduce global health disparities. Audience: Graduate

POP HLTH 819 – SOCIAL NETWORK ANALYSIS AND HEALTH

3 credits.

Provides an overview and synthesis of research utilizing social network analysis in relation to health, drawing on studies by sociologists, economists, computer scientists, physicians and health services researchers. Enables students to understand how social network data are collected and processed; how to calculate appropriate network measures; how to apply statistical modeling of social network effects on health behavior. Surveys social network studies related to substance use, smoking, contraception, AIDS, obesity and many other health conditions. Also looks at the social networks of health organizations in relation to patient outcomes. Prior coursework in data analysis and statistical methods is recommended.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

Learning Outcomes: 1. Formulate research questions relevant to social network analysis. Audience: Graduate

2. Describe the sources, advantages, and disadvantages of alternative types of social network data. Audience: Graduate

3. Describe a social network and compare attributes across different social networks. Audience: Graduate

4. Describe theoretical and empirical issues in current research on social network analysis and health. Audience: Graduate

POP HLTH 820 – GRADUATE RESEARCH SEMINAR

1 credit.

Presentations by graduate students, professors, public health professionals and experts designed to cover the depth and breadth of research in the field of population health.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024

POP HLTH 845 – SEMINAR IN HEALTH AND MENTAL HEALTH ECONOMICS

1-3 credits.

Provides an overview of current topics in health and mental health economics. The main objectives of this seminar is to acquaint students with important current topics, literature, and scholarship in this field.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Fall 2016

POP HLTH 847 – CARDIOVASCULAR EPIDEMIOLOGY

1 credit.

The main emphasis is the discussion of the population distribution, health impact, risk factors, treatment, and prevention of cardiovascular diseases.

Requisites: SOC/POP HLTH 797

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

POP HLTH/ECON 848 – HEALTH ECONOMICS

1-3 credits.

Health economics issues including demand, supply and pricing, market structure, medical malpractice, technological change, value of life, role of insurance, and other aspects of uncertainty.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

Learning Outcomes: 1. Describe the breadth of themes in health economics, organized under three main topic areas (the production of health; the value of health and health care; and the use of evidence to make decisions in health and healthcare contexts), and to develop appropriate analytical and methodological skills Audience: Graduate

2. Enhance analytical and writing skills by producing several short papers Audience: Graduate

3. Enhance scholarly oral presentation skills Audience: Graduate

POP HLTH/AN SCI/GENETICS 849 – GENETIC EPIDEMIOLOGY

3 credits.

This course will provide an introduction to genetic epidemiology. Topics will include a general overview of genetics and Mendelian and complex inheritance, as well as various elements of study design, including participant ascertainment; phenotype definition; biologic sample selection; genotyping, sequencing, and quality control; measurement of covariates, and choice of analytic methods. We will briefly discuss some of the original study designs and then focus on current study designs for the remainder of the class. Additional emerging topics will be briefly touched upon. Students will complete short homework assignments to enforce concepts learned during lectures, discuss journal articles, and prepare a very short grant application for the mid-term project. In the final weeks of class, students will work together to analyze data from a real genetic study, prepare tables, interpret the findings, and present their project to their peers.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

Learning Outcomes: 1. Evaluate and discuss genetic/genomic epidemiological literature. Audience: Graduate

2. Design simple genetic/genomic epidemiological studies. Audience: Graduate

3. Identify and apply appropriate tests of association between genetic variants and both qualitative and quantitative outcomes using either unrelated individuals or families. Audience: Graduate

4. Summarize and interpret the results of genetic/genomic tests of association. Audience: Graduate

POP HLTH/I SY E 875 – COST EFFECTIVENESS ANALYSIS IN HEALTH AND HEALTHCARE

3 credits.

Basic ideas and tools of cost effectiveness analysis as applied in evaluating medical technologies. Addresses special problems and methods in assessing diagnostic technologies, including ROC analysis, and in measuring health for technology assessment. Uses "classical" and current journal literature.

Requisites: SOC/POP HLTH 797 and POP HLTH/B M I 552

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

Learning Outcomes: 1. Apply basic concepts of economic analysis to the assessment of medical technologies and healthcare interventions more broadly Audience: Graduate

2. Examine health outcomes on a range from objective measures of physical systems to subjective preference-based measures of health utility and describe the benefits and limitations of using quality-adjusted life years (QALYs) as a health outcome measure Audience: Graduate

3. Explain why we seek to obtain estimates of the "opportunity cost" of using health care resources, describe the process of "costing" in economic assessments of medical technologies and identify useful sources of information for obtaining cost information (and their limitations) Audience: Graduate

4. Describe how primary data from randomized controlled trials and observational studies can be designed to assess medical technologies and explain the advantages and disadvantages of different designs in terms of their internal and external validity and decision-relevance Audience: Graduate

5. Describe how evidence from secondary data can be integrated using meta-analysis and decision-analytic modeling methods to assess medical technologies and demonstrate basic ability to design and execute simple decision tree and Markov models for cost-effectiveness analysis Audience: Graduate

POP HLTH 876 – MEASURING HEALTH OUTCOMES

3 credits.

Provides a comprehensive understanding of health outcome measures, including generic health status measures, disease-specific measures, and consumer reports of the quality of care.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2021

POP HLTH/A A E/ENVIR ST/PUB AFFR 881 – BENEFIT-COST ANALYSIS

3 credits.

Presents the welfare economics underpinnings for evaluating the social benefits and costs of government activities. Issues such as uncertainty, the social discount rate, and welfare weights will be discussed; case studies from the environmental, social policy, and agricultural areas will be studied.

Requisites: Graduate/professional standing and (PUB AFFR 818 and 880), or POP HLTH/I SY E 875, or A A E 635

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

Learning Outcomes: 1. Explain the basic mechanics of performing a Cost Benefit Analysis, including methods for valuing costs and benefits, aggregating over time, and analyzing uncertainties. Audience: Graduate

2. Evaluate the strengths and weaknesses of different CBAs and propose strategies to address any shortcomings. Audience: Graduate

3. Debate the advantages and limitations of CBA for public policy and compare it to other approaches. Audience: Graduate

4. Create a CBA for a real-world client from beginning to end, including scoping, background research, valuation of costs and benefits, uncertainty analysis, and interpretation. Audience: Graduate

POP HLTH 890 – SUBSTANCE USE RESEARCH: PREVALENCE, POLICY, TREATMENT

3 credits.

Provides an overview of substance use health services research topics, study designs, data sources, and sufficient knowledge of one substantive topic to support the development of a research proposal.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Learning Outcomes: 1. Describe trends in substance use in the United States. Audience: Graduate

2. Demonstrate understanding of the U.S. health care infrastructure to treat and mitigate the harms associated with substance use. Audience: Graduate

3. Describe clinical, health systems, and policy interventions to prevent, treat, and mitigate the harms associated with substance use, and evidence of their effectiveness. Audience: Graduate

4. Summarize strengths and limitations of datasets available for substance use health services research Audience: Graduate

5. Formulate a substance use health services research question and summarize the relevant evidence in a concise literature review. Audience: Graduate

POP HLTH 904 – SPECIAL TOPICS IN EPIDEMIOLOGY

1-3 credits.

In-depth focus on current areas of epidemiologic investigation. Each semester one or more modules (e.g., cardiovascular, cancer, infectious diseases, women's health, international, etc.) will be offered.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Fall 2018

POP HLTH 915 – INTERNATIONAL HEALTH SYSTEMS AND POLICY

2 credits.

Designed as an independent study with four modules: International Health System Performance; Health Systems in the Context of Global Health Needs; Health Systems in High Income Countries; and the Politics of Health System Development and Reform.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024

POP HLTH 917 – GENERAL PREVENTIVE MEDICINE AND PUBLIC HEALTH ELECTIVE

4 credits.

Introduction to the role of physicians working in various fields of general preventive medicine and public health. Engage with preventive medicine faculty and residents to learn foundational knowledge and skills central to the discipline. Opportunity to select a health issue in Wisconsin and work on a short term project to describe, analyze or address the issue.

Requisites: MED SC-M 810, 811, 812, and 813

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2023

POP HLTH 918 – ENVIRONMENTAL HEALTH AND ADVOCACY

2 credits.

Unique opportunity to gain insight into the role of environmental toxins while honing skills to advocate for patients and vulnerable populations. Learn to take environmental histories and understand how environmental medicine is applied in the clinical setting and community. Use the socio-ecological model to frame advocacy. Gain practical experience through online didactic lectures, reading materials, class discussion, reflections and a class presentation

Requisites: MED SC-M 810, 811, 812, and 813

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2023

Learning Outcomes: 1. Describe how various categories of environmental toxicants (including carcinogens, mutagens, teratogens, neurotoxins, and endocrine disrupters) affect human health Audience: Graduate

2. Demonstrate skill in taking a robust patient history by understanding the potential toxicants in a patient's environment Audience: Graduate

3. Practice risk communication strategies, simulating patient and population encounters Audience: Graduate

4. Describe why certain populations, including children, pregnant women, the elderly and marginalized populations are more vulnerable to environmental exposure Audience: Graduate

5. Discuss the role and approaches to engaging key stakeholders in environmental justice issues, including consumer/advocacy groups, community organizations, governmental organizations, corporations, and various industries/professions Audience: Graduate

6. Identify credible evidence and appraise scientific literature to address both patient and population-level environmental health issues Audience: Graduate

7. Identify the positive and negative impact of various public policies on environmental justice Audience: Graduate

8. Discuss opportunities for physician advocacy across the social ecological framework to address environmental issues incorporating a systems-thinking lens Audience: Graduate

**POP HLTH/KINES 955 – SEMINAR - PHYSICAL ACTIVITY
EPIDEMIOLOGY**

1 credit.

Current research developments in physical activity epidemiology.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Fall 2022

Learning Outcomes: 1. Name and explain the basic concepts of physical activity epidemiology, including study designs, public health guidelines, surveillance, and physical activity measures Audience: Graduate

2. Critically evaluate current research on physical activity and health topics Audience: Graduate

3. Prepare a presentation and lead a group in an in-depth discussion of the methods, interpretation, and implications of recent scientific articles Audience: Graduate

POP HLTH 990 – RESEARCH

1-8 credits.

Research supervised by individual faculty members.

Requisites: Consent of instructor

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024