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 2025
Learning Outcomes: 1. Define public health and its core functions
Audience: Undergraduate

2. Describe the difference between individual- and population-based strategies for improving health, including primary, secondary, and tertiary prevention approaches
Audience: Undergraduate

3. Describe major causes and trends in morbidity and mortality in the U.S. and globally
Audience: Undergraduate

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

5. Describe the challenges and opportunities for evidence-based public health practice, focusing on health equity and social justice
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 2024
Learning Outcomes: 1. Create and modify SAS datasets using programming structures within the SAS Data Step (e.g. Do loops, If/Then/Else, Functions, and Arrays).
Audience: Graduate

2. Utilize various SAS Procedures to explore SAS datasets, to summarize information in SAS datasets, and to perform basic statistical analyses.
Audience: Graduate

3. Recognize common SAS program errors, identify strategies for debugging SAS programs, and implement general techniques to check and verify your coding.
Audience: Graduate

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 2025
Learning Outcomes: 1. Describe the principles and practice of environmental health.
Audience: Undergraduate

2. Describe environmental health and its history as a crucial aspect of the history of public health
Audience: Undergraduate

3. Describe the U.S. and world health status and issues as background framework to environmental health.
Audience: Undergraduate

4. Describe a brief introduction to the public health research methodologies including epidemiology and toxicology.
Audience: Undergraduate

5. Describe crucial infectious and non-infectious disease principles as necessary to understand issues in environmental health.
Audience: Undergraduate

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 2024
Learning Outcomes: 1. Describe the health science of air pollution's effect on human health.
Audience: Both Grad & Undergrad

2. Describe air pollution and its history as a crucial aspect of the history of environmental health.
Audience: Both Grad & Undergrad

3. Describe the U.S. and world health status and issues from air pollution.
Audience: Both Grad & Undergrad

4. Describe a brief introduction to the public health research methodologies and science including epidemiology and toxicology, risk assessment and the lungs.
Audience: Both Grad & Undergrad

5. Describe the detailed scientific and policy information on indoor and outdoor air pollutants.
Audience: Both Grad & Undergrad

6. Describe the science and policy solutions for air pollution and human health issues.
Audience: Graduate

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 2025

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 2024
Learning Outcomes: 1. Know and recognize statistical and probability terminology, symbols, definitions, and formulas
Audience: Graduate

2. Explain the meaning, assumptions, and interrelationships of statistical and probability concepts and formulas
Audience: Graduate

3. Execute probability and statistical calculations from information provided
Audience: Graduate

4. State assumptions, conclusions and interpretation in terms of statistical and probability computations
Audience: Graduate

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 2025
Learning Outcomes: 1. State the assumptions underlying linear, logistic, survival and Poisson regression models, recognize and address violations of those assumptions, and estimate and interpret regression models to answer epidemiologic and public health research questions.
Audience: Graduate

2. Critique uses of linear, logistic, survival and Poisson regression models in the epidemiologic and public health literature.
Audience: Graduate

3. Translate epidemiologic concepts into statistical modeling assumptions, and explain statistical modeling assumptions in epidemiologic terms.
Audience: Graduate

4. Recognize applications that require methods beyond their expertise, and identify resources to learn about more advanced techniques.
Audience: Graduate

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
Learning Outcomes: 1. Recognize the utility of humanistic methods for the study of modern international health
Audience: Undergraduate

2. Develop critical thinking skills through techniques of close reading and written analysis
Audience: Undergraduate

3. Understand essential developments in the evolving relationship between global history, politics, and public health on a global scale.
Audience: Undergraduate

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 2025

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 2024
Learning Outcomes: 1. Discuss the physiology and pathology of toxicology, understanding the basicfundamentals of toxicology and toxic agents
Audience: Both Grad & Undergrad

2. Demonstrate metabolism and breakdown of toxicants using a given dataset
Audience: Both Grad & Undergrad

3. Recognize various experimental models to obtain scientific results
Audience: Both Grad & Undergrad

4. Implement knowledge to design experiments applicable to one’s own research
Audience: Both Grad & Undergrad

5. Critique an example of toxicology in media and develop a presentation of this example
Audience: Both Grad & Undergrad

6. Explore new areas to assist in career development via journal club
Audience: Graduate

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 2025
Learning Outcomes: 1. Explain and identify the effects of toxicants on specific organs within the human body
Audience: Both Grad & Undergrad

2. Demonstrate metabolism and reactions of toxicants within organ systems using a given dataset
Audience: Both Grad & Undergrad

3. Classify different means of risk assessment and the conceptual rationale behind these methods
Audience: Both Grad & Undergrad

4. Implement knowledge to design experiments applicable to one's own research
Audience: Both Grad & Undergrad

5. Relate specific organ concepts with conceptual examples from M&ENVTOX 625 to enhance scientific understanding
Audience: Undergraduate

6. Appraise concepts to research to identify future research concepts.
Audience: Graduate

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 2025
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
Learning Outcomes: 1. Define and describe the evolution of foundational concepts related to of global health - including tropical medical, international health, global public health, one health and planetary health.
Audience: Both Grad & Undergrad

2. Describe and review global health competencies and develop a personalized assessment and roadmap identifying current skills and skill levels and goals for acquiring additional desired competencies needed to carry out research and implement programs in a global context.
Audience: Both Grad & Undergrad

3. Identify and use information from inter-disciplinary sources, including quantitative and qualitative data, as well as historical and cultural information, to gain a place-based understanding of the health status and health care system, as well as the overall socio-cultural context in which the project takes place.
Audience: Both Grad & Undergrad

4. Carry out topical placed-based study (retrospective or prospective) individually, or in pairs or small groups.
Audience: Graduate

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
Learning Outcomes: 1. Explain the global burden of diseases, the health transition, and the triple burden of disease as it relates to the country/region studies
Audience: Both Grad & Undergrad

2. Describe how country-specific environmental, cultural, economic, and social factors influence health.
Audience: Both Grad & Undergrad

3. Review the structure of the health system in the country studied, the role of primary health care, public health, and non-governmental organizations in the health sector.
Audience: Both Grad & Undergrad

4. Explore public health approaches for maintaining health and preventing and treating illness in community settings, including surveillance, diagnostic activities, and interventions. This should include basic health needs such as maternal and child health and nutrition, as well as transnational health challenges such as avian flu, HIV/AIDS and other acute and chronic emerging issues.
Audience: Both Grad & Undergrad

5. Utilize principles and strategies for interdisciplinary team work (communication, negotiation, respect for group dynamics, and conflict resolution).
Audience: Both Grad & Undergrad

6. Explore concepts related to cultural competence and cultural humility, as well participatory community approaches to health.
Audience: Both Grad & Undergrad

7. Examine ethical issues related to global health.
Audience: Both Grad & Undergrad

8. Describe diseases commonly found in the country studied and explain the etiology, epidemiology, clinical presentation in humans and animals, public health implications, and prevention and treatment strategies.
Audience: Graduate

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: Fall 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: Fall 2024
Learning Outcomes: 1. Extend the knowledge of regression analysis beyond ordinary linear models
Audience: Graduate

2. Describe the features of correlated data and their implications in drawing inference
Audience: Graduate

3. Construct proper linear and generalized linear models for longitudinal and clustered data
Audience: Graduate

4. Describe the assumptions needed for estimation and inference
Audience: Graduate

5. Implement the inference procedures to solve real-world problems using statistical packages such as SAS and R
Audience: Graduate

6. Use diagnostic tools to assess model fit
Audience: Graduate

7. Interpret and present the analytic results to answer substantive questions
Audience: Graduate

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
Learning Outcomes: 1. Apply, analyze, and evaluate advanced theories, concepts, and methods in Biostatistics in relation to the discipline of Epidemiology.
Audience: Graduate

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 2025
Learning Outcomes: 1. Apply concepts learned in coursework to real life situations
Audience: Both Grad & Undergrad

2. Read and effectively search scientific literature
Audience: Both Grad & Undergrad

3. Develop critical, analytical, and independent thinking skills
Audience: Graduate

POP HLTH/I SY E 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/B M I 542
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2024
Learning Outcomes: 1. Develop an answerable clinical research question.
Audience: Graduate

2. Search relevant scientific literature using several electronic databases and other sources of evidence (published and unpublished) across disciplines.
Audience: Graduate

3. Manage sources of evidence with reference management software.
Audience: Graduate

4. Critically review published clinical research on a chosen topic.
Audience: Graduate

5. Develop a search strategy and conduct a systematic review or other form of evidence review.
Audience: Graduate

6. Present a planned or actual evidence review to interdisciplinary peers.
Audience: Graduate

7. Describe the implications for translation of the proposed evidence review from an interdisciplinary perspective.
Audience: Graduate

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 2025
Learning Outcomes: 1. Understand and communicate the conceptualization of translational and outcomes research in health and health care.
Audience: Graduate

2. Illustrate basic concepts and methods in translational and outcomes research as applied to current issues in health and health care through creating a proposed study.
Audience: Graduate

3. Demonstrate an understanding of the diverse perspectives on health and health care that can be used to inform translational and outcomes research in different organizations, including those within community settings.
Audience: Graduate

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 2024
Learning Outcomes: 1. Understand the scope of public health activities practiced by physicians today.
Audience: Graduate

2. Identify common themes in the career paths of physicians who have integrated medicine and public health.
Audience: Graduate

3. Describe common approaches that physicians use to improve the health of the public, including communication, advocacy, professionalism, and systems-based approaches.
Audience: Graduate

4. Identify opportunities for further work in public health with physicians with diverse backgrounds.
Audience: Graduate

5. Create your own plan for a "path of distinction" in public health
Audience: Graduate

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
Learning Outcomes: 1. Describe the changing epidemiology and impact of HIV/AIDS in the U.S. and worldwide
Audience: Graduate

2. List co-factors of and strategies to prevent HIV transmission
Audience: Graduate

3. Identify how HIV progresses to AIDS and strategies to manage HIV disease
Audience: Graduate

4. Describe current and future areas of research that aim to prevent transmission of HIV
Audience: Graduate

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 2024
Learning Outcomes: 1. Describe popular and less popular conspiracy theories related to biomedical and public health interventions and their origins.
Audience: Graduate

2. Explain the psychological and psychosocial basis of conspiracy theory adoption and perpetuation.
Audience: Graduate

3. Implement techniques to change individual and public opinion and behaviors related to public health and medical interventions.
Audience: Graduate

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 2025
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
Learning Outcomes: 1. Describe involved organizations and disciplines as well as current methods for disaster planning, preparedness and response; public health threats and contingency plans.
Audience: Graduate

2. Examine the impacts of emergencies and disasters to our systems, health and society.
Audience: Graduate

3. Describe the role of the physician as provider and partner in disaster planning, preparedness and response.
Audience: Graduate

4. Incorporate reflection and self-assessment regarding ethical challenges and considerations in public health emergency and response.
Audience: Graduate

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 2025
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
Last Taught: Fall 2024
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
Learning Outcomes: 1. Summarize the history of environmental health sciences as a crucial aspect of public health and environmental justice.
Audience: Graduate

2. Discuss and predict why a systems thinking approach is appropriate for addressing environmental health problems and environmental justice.
Audience: Graduate

3. Explain differences in types and classes of environmental hazards (e.g., metals), their sources (e.g. air pollution, land use), how people are exposed and health effects.
Audience: Graduate

4. Understand core principles in toxicology (e.g., toxicokinetics, dose-response) pertain to the environmental health sciences.
Audience: Graduate

5. Analyze an environmental health issue using an environmental health sciences and systems thinking framework and make policy recommendations.
Audience: Graduate

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 2025
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
Learning Outcomes: 1. Present the biological principles needed to understand the basicphysiological/anatomical/histological/biochemical processes of a normal human.
Audience: Graduate

2. Present the biological principles needed to understand the basic mechanisms of disease processes involving infection, cancer and toxic substances.
Audience: Graduate

3. Exercise the skills needed to be familiar with the terminology pertinent to the above processes.
Audience: Graduate

4. Exercise the skills needed to be able to find, access and understand literature pertinent to the above processes.
Audience: Graduate

5. Foster an increased level of comfort in the communication of these health care professionals in training and clinicians and basic scientists.
Audience: Graduate

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 2025
Learning Outcomes: 1. Demonstrate basic understanding and application of principles of Population Health Sciences in characterizing the multiple determinants of health and the optimal allocation of resources across those determinants for the improvement of health and reduction of disparities
Audience: Graduate

2. Demonstrate basic understanding and application, at a basic level, of the principles of microeconomic theory relating to human and institutional decisions in the allocation of scarce resources for the production of health at individual, system and population levels
Audience: Graduate

3. Demonstrate basic understanding of the role of socioeconomic status, behavior, and community on the production of health at individual and population levels
Audience: Graduate

4. Demonstrate basic understanding of the historical and current financing and provision of health care services in the United States and its shaping by the political and policy processes
Audience: Graduate

5. Demonstrate basic understanding and application of the principles of health measurement and its role in the design of health services, policy, intervention and evaluation
Audience: Graduate

6. Demonstrate basic understanding of policy and program evaluation and its role in research dissemination
Audience: Graduate

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 2025
Learning Outcomes: 1. Describe the broad aims and the major content areas of health services research.
Audience: Graduate

2. Identify a study's research questions, hypotheses, theoretical framework, study design, methodological approaches, and conclusions.
Audience: Graduate

3. Identify the strengths and limitations of prominent experimental and quasi-experimental designs as implemented in HSR, the assumptions each relies upon, and specific methods to assess plausibility of each assumption.
Audience: Graduate

4. Assess, and identify feasible methods to improve, the internal and external validity of a specific research study.
Audience: Graduate

5. Gain facility with key methods of professional communication about health services research studies (conference presentation, discussion, and referee report).
Audience: Graduate

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 2024
Learning Outcomes: 1. Calculate and interpret measures of health used to characterize morbidity and mortality in populations.
Audience: Graduate

2. Identify features of epidemiologic study designs, their strengths and limitations, and measures of association used to determine the relation between exposures and outcomes of interest.
Audience: Graduate

3. Describe major sources of bias and confounding in epidemiologic research, and how they can be addressed.
Audience: Graduate

4. Evaluate causal inferences between risk factors and health.
Audience: Graduate

5. Identify and interpret the presence of interaction between multiple risk factors in relation to an outcome.
Audience: Graduate

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: SOC/POP HLTH 797
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2025
Learning Outcomes: 1. Select, calculate and interpret measures of frequency and measures of effect used in different types of epidemiologic studies
Audience: Graduate

2. Demonstrate understanding of the rationale behind the design of epidemiologic studies
Audience: Graduate

3. Identify sources and types of bias in epidemiologic studies
Audience: Graduate

4. Explain common strategies to prevent and correct for bias in epidemiologic studies
Audience: Graduate

5. Evaluate the validity and extrapolability of results from epidemiologic studies
Audience: Graduate

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 2025
Learning Outcomes: 1. Describe how factors related to the host, organism, and environment interrelate to cause and mitigate the spread infectious diseases.
Audience: Graduate

2. Apply the tools of infectious disease epidemiology are used in surveillance, outbreak investigation, and research studies.
Audience: Graduate

3. Characterize the impact of infectious diseases on populations and communities locally and globally.
Audience: Graduate

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 2024
Learning Outcomes: 1. Demonstrate a good understanding of the main features of the counterfactual model as a base for causal inferences in epidemiological research.
Audience: Graduate

2. Identify assumptions needed for causal inference and assess whether they are sufficient to allow the estimation of causal effects from available data.
Audience: Graduate

3. Understand and use design and analytic strategies that help in the estimation of causal effects.
Audience: Graduate

4. Demonstrate a good understanding of the main features of the counterfactual model as a base for causal inferences in epidemiological research.
Audience: Graduate

5. Identify assumptions needed for causal inference and assess whether they are sufficient to allow the estimation of causal effects from available data.
Audience: Graduate

6. Understand and use design and analytic strategies that help in the estimation of causal effects.
Audience: Graduate

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 2025
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 2025
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 2025
Learning Outcomes: 1. Gain skills in making professional presentations
Audience: Graduate

2. Gain skills in commenting on other scholars' work
Audience: Graduate

3. Describe the importance of Individual Development Plans (IDPs)
Audience: Graduate

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
Learning Outcomes: 1. Describe the major types of cardiovascular disease and their distributions in the population.
Audience: Graduate

2. Describe the general pathophysiology underlying each major type of cardiovascular disease.
Audience: Graduate

3. Identify the primary risk factors for each major type of cardiovascular disease.
Audience: Graduate

4. Describe how each major type of cardiovascular disease is assessed in clinical practice and in epidemiological studies.
Audience: Graduate

5. Describe the major epidemiological studies that have provided the foundation of knowledge in this field.
Audience: Graduate

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 2024
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 2025
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
Learning Outcomes: 1. Understand key measurement issues involved in health, healthcare quality, and health policy
Audience: Graduate

2. Appreciate and describe the application of these measurement issues to practical problems and research
Audience: Graduate

3. Appreciate and describe the importance of concise oral and written scholarly communication through several writing exercises and oral presentations
Audience: Graduate

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 2024
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
Last Taught: Fall 2024
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
Learning Outcomes: 1. Apply, analyze, and evaluate advanced theories, concepts, and methods in epidemiology
Audience: Graduate

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 2025
Learning Outcomes: 1. Evaluate the contributions of health care to population health outcomes
Audience: Graduate

2. Identify a set of broad criteria to evaluate health system performance
Audience: Graduate

3. Evaluate the current performance of the U.S. health care system in comparison with other national health systems
Audience: Graduate

4. Identify the key challenges in global health governance
Audience: Graduate

5. Analyze the social values and political interests that shape health systems development and reform efforts
Audience: Graduate

6. Explain how action outside the health sector is essential for preventing noncommunicable diseases, reducing health care costs, and improving population health and well-being
Audience: Graduate

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 2025
Learning Outcomes: 1. Apply the steps that are necessary to complete a public health investigation
Audience: Graduate

2. Describe the importance of engaging appropriate stakeholders in completing a public health investigation
Audience: Graduate

3. Effectively communicate findings to public health and healthcare audiences
Audience: Graduate

4. Discuss the role of applied and academic public health in maintaining the health of a community
Audience: Graduate

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 2025
Learning Outcomes: 1. Exhibit a broad understanding of general population health sciences (including population health and epidemiology principles.
Audience: Graduate

2. Conduct independent research using a variety of approaches.
Audience: Graduate

3. Think critically to address research challenges.
Audience: Graduate

4. Exhibit and foster professional and ethical conduct in their research.
Audience: Graduate

5. Collaborate with other investigators within or outside the thesis/dissertation lab.
Audience: Graduate