PH.340 (EPIDEMIOLOGY)

Courses

Course location and modality is found on the BSPH website (https://publichealth.jhu.edu/courses/).

PH.340.600. Stata Programming I (Basic). 2 Credits.
Teaches Stata programming in a systematic way to students who have had exposure to Stata or another statistical package, but may not have the tools to perform complex analytical projects independently. Covers data management, programming concepts, procedural programming, Stata-specific commands and constructs, and project workflow.

PH.340.601. Principles of Epidemiology. 5 Credits.
Introduces principles and methods of epidemiologic investigation of infectious and noninfectious diseases. Illustrates methods by which studies of the distribution and dynamic behavior of disease in a population can contribute to an understanding of etiologic factors, modes of transmission, and pathogenesis. Presents different types of study design, including randomized trials, case-control and cohort studies, risk estimation, and causal inferences. Demonstrates the relationship between epidemiology and the development of policy. Laboratory problems provide experience in epidemiologic methods and inferences, illustrating a common-vehicle epidemic; the spread of infectious disease in school, home, and community; epidemiological aspects of a noninfectious disease; vaccination; the epidemiological approach to health services evaluation; rates of morbidity and mortality; sensitivity and specificity; and life table methods.

PH.340.602. Intermediate Epidemiology. 3 Credits.
Covers key principles, designs and methods of observational epidemiology studies. Includes a description of general designs of the main observational studies (birth cohort analysis, ecologic studies, cohort, case-based case-control studies, case-control studies within a defined cohort, and case-crossover studies), measures of disease frequency (cumulative incidence, rate and odds) and of association (relative risk, odds ratio), evaluation of confounding and interaction, types of bias, and the most often used methods of adjustment for confounding effects and their assumptions. Employs lectures and group discussions of exercise

PH.340.603. Applied Epidemiologic Analyses for Causal Inference. 2 Credits.
Introduces concepts and applications of potential outcomes and structural causal models for the estimation of causal parameters in epidemiologic research. Familiarizes students with the assumptions underpinning modern causal inference methods and provides a conceptual understanding of standardization/g-computation and inverse probability weighting. Applies each of these methods in estimating the effect of a time-fixed exposure in a simple setting. Discusses the application of these methods in the literature.

PH.340.604. Introduction to 'Omics in Public Health. 2 Credits.
Introduces quantitative scientists to how "omics" can address public health questions. Reviews basic biology concepts for –omics with a focus on genomics, epigenomics, transcriptomics, and metabolomics. Presents commonly used –omic measurement methods and data preprocessing tools. Discusses challenges that may arise in data analysis due to data measurement issues as well as interpretation of results.

PH.340.606. Methods for Conducting Systematic Reviews and Meta-Analyses. 4 Credits.
Presents basic methods in the qualitative and quantitative meta-analysis, including formulating a hypothesis that can be addressed via meta-analysis, methods for searching the literature, abstracting information, and synthesizing the evidence. Includes Bayesian and likelihood approaches to meta-analysis quantitative methods. Emphasizes essential steps of conducting systematic reviews through hands-on exercises. Focuses on analytical skills in performing meta-analyses and network meta-analyses.

PH.340.607. Introduction to Cardiovascular Disease Epidemiology. 4 Credits.

PH.340.608. Using Big Data for Epidemiologic Research in Health Care. 0.5 Credits.
Demonstrates a practical approach to big data: where to find it, how to store and analyze it, and why to use it. Provides a technical overview of the utilization of big data with the inclusion of several case examples and inclusion of industry leaders in the application of big data to health care.

PH.340.609. Concepts and Methods in Infectious Disease Epidemiology. 4 Credits.
Develops deeper understanding of the concepts and quantitative methods unique to infectious disease epidemiology. Builds upon the concepts and methods of general epidemiology and knowledge of specific infectious diseases. Topics include disease emergence, transmissibility and the basic reproductive number, transmission patterns and serial intervals, seasonality, virulence, heterogeneity in hosts and pathogens, herd immunity, diagnosis of infectious diseases, co-infections, and phylodynamics.

PH.340.610. The One Health Approach to Epidemiology and Global Public Health: Problem Solving Seminar. 3 Credits.
Introduces students to the One Health approach to public health research and practice, providing examples of how evidence shapes public health policy and health promotion, from the local to the global scale. Students will practice strategic thinking and decision making in translating evidence to behavior and policy and will have the opportunity to interact with guest speakers working in One Health fields.

PH.340.612. Epidemiologic Basis for Tuberculosis Control. 3 Credits.
Considers epidemiologic principles relevant to addressing the global burden of tuberculosis (TB). Examines diagnosis of TB infection and disease; risk factors; prevention by case-finding, treatment, vaccination, and preventive therapy; TB in children and during pregnancy, drug-resistant TB, cost-effectiveness and modeling; policy and advocacy; and post-TB sequelae. Offers lectures, group discussions, and review of the TB literature as the primary components.

PH.340.613. Design and Conduct of Clinical Trials. 2 Credits.
Introduces clinical trial design in the context of epidemiological concepts, covers various topics in the design and conduct of clinical trials, and profiles clinical trials that illustrate these issues. Topics include the definition and history of clinical trials; trial designs, including phase III-IV, cross-over, factorial, and large, simple designs; internal and external validity; controls, randomization, and masking; ethical issues; introductions to data collection and management and analysis principles; monitoring of trials for safety and efficacy; and use of clinical trial data in healthcare decision-making.

PH.340.615. Understanding the Relevance of New Analytical Methods to Epidemiological Research. 2 Credits.
Provides a basis for understanding how new analytic methods are relevant to epidemiologic research. Explores methods in "plain English" in order to focus on utility of the methods as well as how to interpret analyses as they are applied to research. Addresses the assumption of the methods and big picture pros and cons.

PH.340.616. Epidemiology of Aging. 3 Credits.

PH.340.617. Pharmacoepidemiology. 2 Credits.

PH.340.618. Epidemiology: the Basics. 3 Credits.
Introduces the population science of epidemiology, including methods and approaches to measurement and outcomes, study design and inference, risk estimation, and surveillance. Provides the essential elements of epidemiology as appropriate for public health scientists.

PH.340.619. Topics in Pharmacoepidemiology. 2 Credits.
Introduces the key elements of pharmacoepidemiology. Explores the utilization and effects of drugs in large numbers of people and the application of epidemiological methods to pharmacological issues. Focuses on questions of drug safety and effectiveness, concentrating on clinical patient outcomes and on evaluating the use of therapies. Applies the research methods of clinical epidemiology (e.g., randomized trials, cohort studies, case-control studies, use of secondary data, attention to biases and confounding, effects of non-adherence, active and passive surveillance for adverse events) to study medication exposures and outcomes.

PH.340.620. Principles of Clinical Epidemiology. 2 Credits.
Presents lectures and interactive sessions designed to expose students to basic principles of clinical epidemiology and introduce key methods utilized in clinical outcomes research. Focuses on principles and methods in clinical epidemiology which would be most utilized by clinicians/clinician researchers for screening and diagnosis of illness as well as for prognostication and decision-making. Introduces methods and issues in studying clinical epidemiology in health care settings (e.g. administrative data).

PH.340.621. Using Generative Artificial Intelligence (AI) to Improve Public Health. 1 Credit.

PH.340.623. Cancer Epidemiology, Prevention, and Control. 2 Credits.
Emphasizes the role of epidemiology in cancer prevention and control. Compares and contrasts the descriptive epidemiology, natural history, and pathologic and biologic characteristics of selected common cancers, as well as factors related to their etiology. Discusses the influence of environmental and genetic factors and their interplay on the development of cancer together with the epidemiologic issues involved in their investigation. Provides overview of problems involved in cancer prevention and screening.

PH.340.624. Etiology, Prevention, and Control of Cancer. 4 Credits.

PH.340.627. Epidemiology of Infectious Diseases. 4 Credits.
Introduces the basic methods for infectious disease epidemiology and case studies of important disease syndromes and entities. Includes definitions and nomenclature, outbreak investigations, disease surveillance, case-control studies, cohort studies, laboratory diagnosis, molecular epidemiology, dynamics of transmission, and assessment of vaccine field effectiveness. Focuses case studies on acute respiratory infections, diarrheal diseases, hepatitis, HIV, tuberculosis, sexually transmitted diseases, malaria, and other vector-borne diseases.

PH.340.629. The Epidemiology of LGBTQ Health. 3 Credits.
Introduces constructs of sexual orientation and gender identity in the context of public health. Explores historical, epidemiological, and social perspectives related to the physical and mental health of lesbian, gay, bisexual, transgender and queer (LGBTQ) individuals and communities. Orients students to current and historic epidemiological and contextual issues that shape what is known about LGBTQ health, presents an overview of LGBTQ health disparities and interventions, and develops a foundation for critical thinking about LGBTQ health research and intervention potential.

PH.340.630. Topics in Social Epidemiology. 2 Credits.
Provides a systematic and selective overview of conceptual approaches and research findings related to the impact of social context and social phenomena on health. Sessions highlight a different area of frontier social epidemiology research. Social processes examined include 1) social inequalities (including social class differences as well as the effects of income inequality), 2) social networks, 3) neighborhood and urban characteristics, 4) gender inequalities and 5) macro-social changes. Discusses global health approaches to social determinants of health including research experiences from different parts of the world. Includes discussion of methods related to the study of social epidemiology; however, this is not intended to be a methods course. Includes limited lecture matter and thorough group discussions on selected classic papers and latest readings.

PH.340.631. Practical Skills in Using Generative Artificial Intelligence (GenAI) in Public Health. 2 Credits.
Provides hands-on instruction to develop practical skills in use of generative AI for public health applications. Uses worked examples and group exercises to build skills in: (a) drafting policy briefs, op-eds and persuasive prose; (b) writing statistical code; (c) data visualization; (d) developing career materials; (e) drafting grant proposals, research products, and teaching materials; (f) summarizing data for decision-makers; and (g) writing more effective interpersonal communications.

PH.340.633. Data Management in Clinical Trials. 3 Credits.
Acquaints students with important principles of the acquisition, management, and distribution of data in the clinical research environment. Focuses on real-world needs of investigators and emphasizes those issues that researchers need to understand to work effectively with other members of study teams, including coordinators, data entry staff, programmers, and data managers. Covers topics that apply to many studies, and discusses approaches ranging from small single-investigator trials using only a spreadsheet through international networks using sophisticated web-based data management systems, although does not focus on any particular type or size of study. Discusses the benefits and costs of alternatives rather than recommending particular courses of actions. Combines practical and hands-on exercises with advanced treatment of important concepts, although it does not focus on computer programming.

PH.340.635. Clinical Trials: Issues and Controversies. 2 Credits.

PH.340.636. Epidemiology in Evidence-Based Policy. 2 Credits.
Focus on how scientific evidence in general and epidemiologic studies in particular are used to inform health and regulatory policies. Reviews the role of scientists and epidemiologists in translating evidence to practice and policy; examines how science fares in the legislative, regulatory, and judicial settings; addresses methodological issues related to types and availability of evidence to guide policy. Topics include nutrition recommendations (e.g. population-wide sodium intake), environmental policies; opioid epidemic (e.g. safe injection sites); tobacco control and e-cigarettes; health disparity (e.g., racial disparities in kidney transplantation); diabetes prevention; legal and policy implications of class action lawsuits (e.g., gun policy and local food policy); COVID-19 (e.g., evidence-informed policy making during a pandemic); and modelling to guide policy. Guest faculty, experts in their field, present examples, discuss their experiences using evidence to guide policy.

PH.340.639. Assessing Epidemiologic Impact of Human Rights Violations. 2 Credits.

PH.340.640. Eye Disease: Epidemiology and Control. 1 Credit.
Presents lectures and group discussions on the pathology, clinical manifestations, epidemiology, treatment, and control of the major blinding diseases, including diabetic retinopathy, cataract, glaucoma, trachoma, and age-related macular degeneration, as well as refractive error and ocular complications of Ebola and Zika.

PH.340.641. Healthcare Epidemiology. 4 Credits.

PH.340.643. Bioinformatic Strategies for Microbiome Data. 2 Credits.
Introduces key steps for bioinformatic analysis of microbiome data from preparing the data for analysis to visualizing the results. Provides a foundation in ecological concepts including alpha and beta diversity. Explains different methods for finding microbes that differ between environments. Prepares students to plan their own analyses and interpret the results using lectures and hands-on data interpretation exercises.

PH.340.644. Epidemiology of Diabetes and Obesity. 2 Credits.
Describes the epidemiology and prevention of diabetes, obesity, and associated complications. Discusses methodological issues associated with evaluating these in epidemiologic studies. Designed to cover the global epidemics of diabetes and obesity, environmental and genetic risk factors, as well as interventions to improve diabetes outcomes and weight management. Includes lectures from several expert faculty members in the School of Public Health and the School of Medicine

PH.340.645. Introduction to Clinical Trials. 3 Credits.
Introduces clinical trial design in the context of epidemiological concepts, covers various topics in the design and conduct of clinical trials, and profiles clinical trials that illustrate these issues. Topics include the definition and history of clinical trials; trial designs, including phase I-IV, cross-over, factorial, and large, simple designs; internal and external validity; controls, randomization, and masking; ethical issues; data analysis principles; monitoring of accumulating safety and efficacy data; and use of data from randomized trials.

PH.340.646. Epidemiology and Public Health Impact of HIV and AIDS. 4 Credits.

PH.340.648. Clinical Trials Management. 3 Credits.
Provides an overview of methods related to the day-to-day conduct of multicenter randomized clinical trials with an emphasis on the Coordinating Center perspective. Using case studies of multicenter clinical trials for illustration, emphasizes topics related to practical applications such as organizational models, use of standardization, and performance monitoring. Discussion of methods is encouraged, including alternatives to usual practice.

PH.340.650. Nutrition Epidemiology (Sum Epi). 2 Credits.

PH.340.651. Emerging Infections. 2 Credits.
Explores the factors promoting the emergence of new infectious diseases and the re-emergence of some of the more traditional infections. Evaluates agent, host, environmental and ecological factors in the emergence of infectious diseases. Presents methods of surveillance and early recognition of several important emerging infections. Includes discussions from lecturers with considerable experience in the investigation of specific emerging infections on the issues specific to emerging infections. Presents and discusses a paper describing an investigation of an Emerging Infection following each one-hour lecture. Presents, describes, and analyzes the factors related to the emergence of infectious diseases, new and old, that have emerged as important public health problems, or which have the potential for major epidemic spread. Explains possible methods for the rapid recognition, prevention, and control.

PH.340.653. Epidemiologic Inference in Outbreak Investigations. 3 Credits.

PH.340.654. Epidemiology and Natural History of Human Viral Infections. 6 Credits.

PH.340.655. Advanced Methods in Clinical Trials. 3 Credits.
Expands on the concepts presented in Introduction to Clinical Trials (340.645) and Clinical Trials: Procedures, Design, and Interpretation of Results (340.861) by elaborating on clinical trial analytical considerations and design options in both the regulatory, clinical, and public health context. Details design considerations, budgeting and recruitment strategies, communication of clinical trial results, and reporting responsibilities. Navigates the financial and administrative aspects of trial planning, creates a comprehensive recruitment strategy, applies necessary trial components and considerations for regulatory submissions, describes the roles and responsibilities of a data/clinical coordinating center, and communicates and interprets the results of a trial.

PH.340.658. Critical Reading of Epidemiologic Literature. 1 Credit.
Develops skills in the critical reading of epidemiologic reports. Reviews key epidemiologic concepts and methods including bias, confounding and interaction. Identifies the key issues and common mistakes in the preparation of epidemiologic reports of empirical research.

PH.340.660. Practical Skills in Conducting Research in Clinical Epidemiology and Investigation. 3 Credits.

PH.340.663. Epidemiology Workshop: Interpreting and Using Epidemiologic Evidence. 2 Credits.

PH.340.666. Foundations of Social Epidemiology. 3 Credits.
Presents applications of social epidemiologic concepts, introduced through weekly online lectures and readings, and the use of discussions and case studies. Prepares students to understand and appreciate the contribution of social factors to disease etiology, course, and the distribution of states of health in populations. Reviews the conceptual and theoretical underpinnings of social epidemiology from an historical perspective. Focuses on the scientific findings in the field from the 1970's until today; the influence of social context on behavior is well known and forms the backbone for most health promotion interventions. Delineates how the social environment influences behavior by shaping norms, reinforcing social control, providing environmental opportunity, and coping strategies.

PH.340.667. Health Equity Research Methods to Address Social Determinants of Health. 4 Credits.
Introduces innovative methods, practical tools, and skills required to conduct evidence-based research that addresses the social determinants of health disparities. Draws on theoretical frameworks on fundamental values and principles, including social justice, human rights, the value of diverse ideas and stakeholder perspectives, inclusiveness, trustworthiness, behavioral and implementation science, and community-based participatory design. Uses lectures, panel discussions, and case-based examples to provide opportunities in obtaining feedback on ideas from experienced investigators.

PH.340.668. Topics in Infectious Disease Epidemiology. 3 Credits.

PH.340.671. Topics in Management of Clinical Trials. 2 Credits.

PH.340.674. Causal Inference: Emulating A Target Trial to Assess Comparative Effectiveness. 2 Credits.
Introduces students to a general framework for the assessment of comparative effectiveness and safety research. The framework, which can be applied to both observational data and randomized trials with imperfect adherence to the protocol, relies on the specification of a (hypothetical) target trial. Explores key challenges for comparative effectiveness research and critically reviews methods proposed to overcome those challenges. The methods are presented in the context of several case studies for cancer, cardiovascular, renal, and infectious diseases.

PH.340.676. Bayesian Adaptive Trials. 2 Credits.
Presents Bayesian adaptive designs and teaches students the skills and considerations necessary to construct such designs. Examines the operating characteristics of Bayesian adaptive designs and the benefits and costs of interim analyses, in particular within the regulatory framework.

PH.340.677. Infectious Disease Dynamics: Theoretical and Computational Approaches. 4 Credits.
Focuses on the dynamic processes that affect the spread of infectious disease. Presents basic conceptual approaches and a survey of specific theoretical and computational methods for simulating the spread of diseases. Specific topics include the effect of population heterogeneity on transmission, simulation of the impacts of interventions, social networks and the links between transmission dynamics and the evolution of pathogens. Particular methods include mathematical models, spatial-temporal analysis of epidemics, social network theory, genetic algorithms, individual based models and other tools of systems epidemiology. Concepts and methods are applied to historical epidemics, current emerging diseases and diseases of international public health importance.

PH.340.678. Infectious disease transmission models for public health decision making. 3 Credits.
Studies global tobacco control methods in depth. Focuses on designing, implementing, and evaluating tobacco control interventions based on the need of a specific region or country. Highlights the use of multi-level solutions linking policy, communication, prevention, education, regulation, advocacy, and community organizing to address the interdisciplinary problem of tobacco use. Examines the aspects of tobacco use and tobacco control through lectures, case studies, presentations, and discussion.Upon successfully completing this course, students should be able to: • Perform a situational assessment of the tobacco control environment in a particular country including the health and economic burden of tobacco use in the country; • List criteria that can be used to determine the tobacco control priorities of a country, and evaluate the strengths and weaknesses of different criteria for setting tobacco control priorities; • Evaluate the strengths and weaknesses of various strategies to reduce tobacco use; •Select and define appropriate indicators for evaluating progress in implementing a tobacco control intervention; •Utilize acquired methods to plan, implement, evaluate, and lead a tobacco control interventions based on the need of a specific region or country; •Utilize acquired methods to formulate grant applications.

PH.340.680. Environmental and Occupational Epidemiology. 4 Credits.
Introduces the key health effects of environmental and occupational exposures and the epidemiologic methods used to identify and estimate those effects. Emphasizes the interplay of methodological issues, including the assessment of environmental exposures and the understanding of specific disease processes in identifying the health impact of environmental exposures in the population. Learns about environmental and occupational exposures (including water and air pollution, food contamination, ionizing radiation, persistent environmental pollutants and emergent environmental exposures) and key methodological issues relevant for these exposures in population studies (including study design, exposure assessment and biomonitoring, disease clusters, dose-response relationships, susceptibility, geographic analysis, and evidence synthesis).

PH.340.682. Pharmacoepidemiology Methods. 3 Credits.
Introduces the key elements of pharmacoepidemiology. Explores the utilization and effects of drugs in large numbers of people. Discusses the application of epidemiological methods to pharmacological issues. Focuses heavily on questions of drug safety and effectiveness, concentrating on clinical patient outcomes and on evaluating the use of therapies. Applies the research methods of clinical epidemiology (e.g., randomized trials, cohort studies, case-control studies, use of secondary data, attention to biases and confounding) to the content area of pharmacology (e.g., determinants of beneficial and adverse drug effects, effects of patient heterogeneity on drug effect, effects of non-adherence, active and passive surveillance for adverse events).

PH.340.683. Human Rights in Public Health Practice. 2 Credits.
Presents human rights as both a tool and an analytical framework for public health practice. Considers how concepts and values from human rights can enhance the work of public health professionals in a variety of realms. This includes the development of policy in public health, the design and implementation of programs, and identification of human rights obstacles to achieving public health goals and potential responses. Examines the relationship between traditional bioethics and human rights approaches to ethical questions and will conclude with discussions and controversies about the roles of public health professionals in advocacy.

PH.340.684. Pharmacoepidemiology: Drug Utilization. 3 Credits.
Provides an overview of drug classification systems as well as a review of data sources used for drug utilization research. Reviews methods of investigating drug utilization and evaluating interventions to modify utilization, such as time-series designs and segmented regression analyses. Discusses varied patient, provider, practice and system-level determinants of prescription drug utilization, including their impact on costs and quality of care. Emphasizes the impact of drug formularies, marketing and promotion of drugs, health insurance exchanges, and emerging evidence of benefits and harms.

PH.340.686. Introduction to Systematic Reviews and Meta-Analysis. 2 Credits.
Reviews methods used by those performing systematic reviews and meta-analysis, including building a team, formulating a research question and hypothesis, methods for searching the literature, abstracting information, and synthesizing the evidence both qualitatively and quantitatively. Covers how to formulate an answerable research question, defining inclusion and exclusion criteria, searching for the evidence, data extraction, assessing the risk of bias in the underlying studies, qualitative synthesis, meta-analysis, sensitivity analysis, and assessing meta-bias. Acquaints students with a few practicalities of conducting a systematic review using hands-on exercises.

PH.340.687. Epidemiology of Kidney Disease. 2 Credits.
Studies kidney disease comprehensively, emphasizing chronic and end-stage kidney disease, since kidney disease is characterized as an epidemic worldwide, and the prevalence continues to rise. Highlights controversies and areas of ongoing and future research by reviewing findings from cohort studies, clinical trials, and landmark studies. Emphasizes methodological issues specific to the study of kidney disease.

PH.340.690. Epidemiologic Approaches to Hearing Loss and Public Health. 1 Credit.
Introduces biologic, epidemiologic and clinical aspects of aging-related declines in the auditory system. Demonstrates methods of assessment of auditory function for epidemiologic studies. Reviews current epidemiologic knowledge of sensory function and aging-related outcomes in older adults, including the epidemiology and consequences of dual sensory loss. Presents areas for future research and opportunities for intervention and prevention

PH.340.691. The Role of Physical Activity in Shaping Public Health and Well-being. 3 Credits.
Examines the operational and programmatic implications of scaling up: evidence based TB-HIV interventions, in particular intensified case finding, infection control and isoniazid preventive chemotherapy; evidence based X/MDR-TB services and evidence-based public-private TB collaborative activities. Examines the challenge of TB elimination in industrialized countries. Assesses the epidemiological impact in national TB control programs of these new tools and interventions.

PH.340.692. Prisons, Public Health, and Human Rights. 2 Credits.
Explores the public health implications of mass incarceration and discusses the human rights and ethical ramifications of providing health care to men, women, and children in jails, prisons, and detention centers both in the United States and internationally. Takes a systems approach to addressing the basic health needs of the prison population, including infection control, care for acute and chronic medical conditions, and mental health care. Students apply problem-solving skills and explore the challenges of providing care in incarcerated settings. Emphasizes the roles of human rights principles and professional ethics in public health.

PH.340.693. Investigation of Outbreaks. 2 Credits.
Learns how to detect, investigate, and interpret disease outbreaks. Focuses on application of epidemiological skills to develop hypotheses relevant to understanding source or reservoirs of infection, modes of spread and possible control measures. Includes simple epidemiological approaches for examining field data on outbreaks and deriving inferences. Reviews the main factors involved in the occurrence of an outbreak and steps in investigating an epidemic. Uses data from large and small epidemics to illustrate the main concepts and terminology.

PH.340.694. Power and Sample Size for the Design of Epidemiological Studies I. 1 Credit.
Systematically introduces students to sample size and power analysis for the most common epidemiological study designs. Provides participants with the key conceptual elements and practical tools for computing sample sizes to achieve a given level of precision and power in statistical tests.

PH.340.696. Spatial Analysis I: ArcGIS. 4 Credits.
Examines the use of Geographic Information System (GIS) software (ArcGIS Pro) as a tool for integrating, manipulating, and displaying public health-related spatial data. Covers mapping, geocoding, and manipulations related to data structures and topology. Introduces the spatial science paradigm: Spatial Data, GIS, and Spatial Statistics. Uses selected case studies to demonstrate concepts along this paradigm. Focuses on using GIS to generate and refine hypotheses about public health-related spatial data in preparation for a formal statistical analysis. Discusses topics related to spatial statistical modeling throughout (although not a required part of the curriculum). Includes both lecture and lab formats with GIS concepts and software-specific details demonstrated during the lab portions.

PH.340.697. Spatial Analysis II: Spatial Data Technologies. 3 Credits.
Examines technologies for collecting, obtaining and creating spatial data. Technologies considered include, but are not limited to GPS, tablets, tracking devices, cell phones, Google Earth, remote sensing applications, and the Internet. Introduces software applications such as ArcGIS, QGIS, and R for integrating spatial data from the aforementioned technologies into useable forms for spatial analysis. Also covers metadata, data accuracy, and confidentiality/disclosure issues.

PH.340.698. Methods For Assessing Power, Privilege, and Public Health in the United States. 4 Credits.
Discusses emergent health issues and how the choice of measures for power, privilege, and inequality influence results in epidemiological research. Challenges you to reflect on how your own positions of privilege influence your interpretation of data and your public health practice. Provides an opportunity to apply epidemiology research skills to develop and execute a data-driven project on a real-world health problem that can will be presented and used by a community partner.

PH.340.699. Epidemiology of Sensory Loss in Aging. 3 Credits.
Introduces biologic, epidemiologic and clinical aspects of aging-related declines in the auditory, visual, and vestibular systems. Demonstrates methods of assessment of sensory function for epidemiologic studies. Reviews current epidemiologic knowledge of sensory function and aging-related outcomes in older adults, including the epidemiology and consequences of dual sensory loss. Presents areas for future research and opportunities for intervention and prevention.

PH.340.700. Stata Programming II (Intermediate). 1 Credit.
Presents advanced topics in Stata Programming to expand upon the material in 340.600. Topics include simulations, advanced programming, file manipulation, and code optimization.

PH.340.701. Epidemiologic Applications of Gis. 2 Credits.

PH.340.705. Advanced Seminar in Social Epidemiology. 4 Credits.

PH.340.706. Methods and Applications of Cohort Studies. 2 Credits.

PH.340.710. Seminar in Disability Health Research. 2 Credits.
Examines disability and disability health within the context of public health research and policy to advance equity and social justice. Discusses the origins and current landscape of disability health research from the perspectives of key stakeholders, inclusive of researchers, advocates, policy makers, with a focus on including the perspectives of people with disability.

PH.340.715. Problems in the Design of Epidemiologic Studies: Proposal Development and Critique. 5 Credits.
Presents the methodologic and logistic problems involved in designing and conducting epidemiologic studies. Students participate in the preparation of a research protocol for a study in a human population. Offers an opportunity to critically evaluate the adequacy and scientific merit of research protocols, develop an appreciation of the ethical aspects of conducting research involving human subjects, and apply methods and principles learned in earlier (340.751 - 753) and current courses to specific epidemiologic problems.

PH.340.716. Implementation Science Concepts, Methods & Study Designs. 2 Credits.
Digs into how to conceptualize implementation science questions, define implementation outcomes, and leverage frameworks and designs to achieve public health impact.

PH.340.717. Health Survey Research Methods. 4 Credits.
Exposes students to the practical aspects of health survey research methods. Emphasizes the development of skills to design and administer a survey. Introduces formative research, sampling methods, questionnaire development, recruitment techniques, interviewer training, and quality assurance/quality control.

PH.340.721. Epidemiologic Inference in Public Health I. 5 Credits.
Introduces principles and methods of epidemiologic investigation of disease and other health states. Presents different types of study designs, including randomized trials, cohort and case-control studies; measurement of exposures and outcomes; risk estimation; surveillance; program evaluation; and causal inference. Discusses evaluation measures for screening programs and health interventions. Links epidemiologic inferences with the development of policy. Activities provide experience in applying epidemiologic methods, interpreting findings, and drawing inferences.

PH.340.722. Epidemiologic Inference in Public Health II. 4 Credits.
Expands knowledge beyond introductory level epidemiologic concepts and methods material, using examples from the published literature. Emphasizes interpretation and the ability to critically evaluate issues related to populations/study design, measurement, population comparisons and inference, including: modern cohort study designs; advanced nested designs; novel techniques for exposure assessment; interpretation and utility of measures of impact; sources of bias and methods for their prevention; descriptive and analytical goals for observational study inference; the counterfactual model for defining exchangeability, cause, and confounding; and synthesis of inferences from observational studies.

PH.340.723. Epidemiologic Practice Methods for Population Health Research. 2 Credits.
Introduces quantitative epidemiologic techniques applied by both academics and public health professionals to analyze and interpret routinely collected at the subpopulation level to target and address health inequities. Four modules include instruction in Stata and R, with topics including:1. Weighted Survey Analysis: Analytic techniques for the incorporation of weights in the analysis of survey data to make inferences about the target population.2. Calculating Life Expectancy: Calculation of single-decrement life tables using statistical programs as well as publically available Excel-based tools.3. Estimate Preventable Deaths: Econometric techniques for estimating preventable deaths and potential lives saved from risk factor modification.4. Conceptual Frameworks in Epidemiology: Apply graph theory to understand the relationships between variables in commonly-used causal frameworks. Understand the importance of using conceptual frameworks in guiding epidemiologic inquiry.

PH.340.724. Global Cancer Epidemiology. 2 Credits.
Examines the causes, incidence, and trends in cancer globally, with a perspective on the differences across settings. Provides an epidemiological foundation for understanding cancer statistics and engaging in international cancer research and control activities. Covers key concepts such as study designs for cancer epidemiology and interventions, use and meaning of common cancer statistics, levels of prevention, and cancer screening/use of diagnostic tests.

PH.340.725. Methods for Clinical and Translational Research. 1 Credit.
Reviews essential concepts and methods of translational research. Emphasizes developing skills in the interpretation and application of reports of findings of translational research. Includes topics such as hypotheses and study design, types of data, statistical analyses, and evidence synthesis methods.

PH.340.726. Implementation Research Methods to Address Real World Epidemiological Questions. 3 Credits.
Considers the use of observational data, including real-world program data, natural experiments and designs for interventions which cannot be ethically or practically randomized and experimental designs, focused on implementation and real-world effectiveness. Analyzes preference-based research methods, which can be observational or experimental, highlighting the importance of human-centered approaches.

PH.340.727. Introduction to Health Survey Research Methods. 2 Credits.
Exposes students to the practical aspects of health survey research by emphasizing the development of skills to design and administer a survey questionnaire. Introduces students to formative research, questionnaire development, interviewer training, and quality assurance/quality control.

PH.340.728. Advanced Methods for Design and Analysis of Cohort Studies. 5 Credits.
Explores advanced methods useful for the design and analysis of cohort studies. Emphasizes methods for analyzing time-to-event data subject to staggered entries using advanced parametric and semi-parametric methods; analytical methods for incomplete observations in cohort studies; methods to measure effects of exposures on time-to-event using relative times and relative hazards; parametric survival analysis methods and taxonomy of hazard functions; coefficients of determination based on parametric models for survival data; regression methods for trajectories of biomarkers; methods for the analysis of interventions in observational studies: confounding by indication, marginal structural models for individual effectiveness; methods for estimating population effectiveness; and methods to jointly analyze longitudinal and survival data.

PH.340.729. U.S. Based National Health Surveys: their Application and Associated Research Methods. 2 Credits.
Introduces the purpose and application of national health surveys, and the strengths and limitations of this type of data. Uses publicly available survey data collected by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS), including data from the National Health Interview Survey (NHIS) and National Health and Nutrition Examination Survey (NHANES) to provide practical experience in accessing the data files, designing and executing basic analysis using complex survey data and determining when and how to appropriately conduct age adjustment and trend analysis. While the class utilizes U.S.-based examples, the principles and methods covered are applicable to other settings.

PH.340.730. Assessment of Clinical Cardiovascular Disease. 2 Credits.
Familiarizes students with techniques used to detect and quantify the presence of clinical cardiovascular disease. Tour the hospital, and the dialysis, angiography, echocardiography, and vascular laboratories. Observe radiographic (CT and MRI) imaging of atherosclerosis and review gross and histological specimens of atherosclerosis in the pathology laboratory. Directly observe various cardiac imaging techniques performed including 1) cardiac echocardiography, 2) coronary or peripheral angiography, 3) coronary calcium scores and coronary CT angiography using multi-detector CT, 4) carotid and peripheral vascular studies using ultrasound, 5) the clinical assessment of blood pressure, and 6) DXA and anthropometric measures of body composition.

PH.340.731. Principles of Genetic Epidemiology 1. 4 Credits.

PH.340.732. Principles of Genetic Epidemiology 2. 3 Credits.
Second offering in a three-part series of graduate courses in Genetic Epidemiology. Details the concepts of linkage disequilibrium and population genetics, including methods for admixture analysis useful for adjusting for individual variation in genetic ancestry/background. Presents the principles of genetic association analyses for quantitative and qualitative phenotypes for population-based studies. Details the concepts and tools related to confounding due to population stratification, and approaches for genome-wide association studies. Introduces methods for linkage analysis in families and use of high-throughput sequence data (whole exome and whole genome). Selected class sessions are dedicated to computer labs to illustrate the methods covered.

PH.340.733. Principles of Genetic Epidemiology 3. 3 Credits.
Concepts behind linkage and association studies in genome-wide studies, and demonstrates how they can be applied to complex qualitative and quantitative phenotypes (i.e. those where both genetic and environmental factors influence the phenotype). Introduces the principles underlying family-based and population-based study designs and analytical methods for both marker panels and sequencing data (whole exome and whole genome).

PH.340.734. Principles of Genetic Epi 4: Emerging and Advanced Methods. 2 Credits.
Discusses advanced topics in genetic epidemiology methods. Builds on the knowledge gained in Principles of Genetic Epidemiology 1-3. Students discuss the details of the methods they have learned, and are also exposed to cutting-edge topics not yet in the mainstream. Also covers emerging topics such as CNV analysis, epigenetic analysis, sequencing analysis, and admixture mapping. Students also carry out an independent analysis project through the term.

PH.340.735. MHS Culminating Experience in Applied Epidemiology. 3 Credits.
Focuses on lectures related to applied epidemiology career paths, epidemiological problem-solving, and decision-making frameworks. Guides students in the development of an 'Epidemiology to Action Portfolio' that leverages applied epidemiology skills to address specific health topics of concern. Produces data briefs, stakeholder and advocacy one-pagers, data dashboards as well as testimony outlines for presentation. Utilizes guides and checklists to support the application of learned skills once students transition into the public health workforce.

PH.340.744. Advanced Topics on Control and Prevention of HIV/AIDS. 4 Credits.
Focuses on directed readings and discussion on the science and pathogenesis of HIV/AIDS. Covers dynamics of the HIV epidemic in the populated world, difficulties and contrasts between clinical management of HIV/AIDS in developed and developing countries, prevention and control modalities against HIV/AIDS, and predicting patterns of future growth of the HIV/AIDS epidemic with special reference to global economic impact of HIV vaccine and eradication issues of HIV/AIDS.

PH.340.751. Epidemiologic Methods 1. 5 Credits.
Presents as the first course in the Epidemiologic Methods sequence. Introduces students to the principles and concepts used in epidemiologic research. Presents material in the context of an epidemiological framework with three major areas: populations and an introduction to study designs; measurement, including measures of accuracy and disease occurrence; and methods used for comparing populations. Illustrates synthesis lectures on how these elements come together in modern epidemiological research. Provides experience using laboratory exercises and assignments with applying concepts and calculations to problems drawn from real epidemiological data and published literature.

PH.340.752. Epidemiologic Methods 2. 5 Credits.
Second offering in the Epidemiologic Methods sequence. Builds on the concepts of epidemiologic reasoning, population health measures, validity, and study design taught in Epidemiologic Methods 1. Provides a detailed presentation of causal inference, study design and threats to validity (confounding, information bias and selection bias). Discusses a wide range of epidemiologic designs in detail, together with their advantages and limitations. Laboratory exercises, assignments, and the MiniProject provide experience with applying concepts and calculations to problems drawn from real epidemiological data and published literature.

PH.340.753. Epidemiologic Methods 3. 5 Credits.

PH.340.754. MHS Culminating Experience in Analytic Epidemiology. 3 Credits.
Offers guided experience for the MHS in Analytic Epidemiology to create a scholarly product that synthesizes/integrates existing knowledge important for improving public health. Utilizes a team approach to develop a substantive research question, determine appropriate analytical methods, conduct analyses, and present research via a poster presentation. Selects data from several datasets that will be made available for this course. Teaches and applies the research process, including formulating a research question, selecting an appropriate analytical method and covariates, conducting the data analysis, and writing a scholarly research paper.

PH.340.761. Epidemiologic Methods for EPI Doctoral Students I. 5 Credits.
Introduces epidemiologic methods to doctoral students in the department of epidemiology (first in a four-term sequence). Delves into the role of epidemiology in public health, clinical and population health research, epidemiologic study designs, and measurement of exposures and health outcomes (validity, reliability, information bias).

PH.340.762. Epidemiologic Methods for EPI Doctoral Students II. 5 Credits.
Introduces epidemiologic methods to doctoral students in the department of epidemiology (second course of four-term sequence). Focuses on the use of regression analysis in epidemiolocal research, selection bias, confounding and methods to address it, and effect modification.

PH.340.763. Epidemiologic Methods for EPI Doctoral Students III. 5 Credits.
Introduces epidemiologic methods to doctoral students in the department of epidemiology including prediction in epidemiology, causal inference methods, mediation, advanced analytical methods to address bias, evidence synthesis, and translational epidemiology.

PH.340.764. Epidemiologic Methods for EPI Doctoral Students IV. 5 Credits.
Introduces epidemiologic methods to doctoral students in the department of epidemiology. Formulates an epidemiologic research question, obtains, cleans, and analyzes data, summarizes findings (graphs, tables, abstract), and presents a project in a poster format.

PH.340.765. Professional Epidemiologic Methods: Epidemiologic intelligence and Population Health Assessments. 2 Credits.
Focuses on practical skills for epidemiological assessments of population health, which include methods for monitoring epidemiological profiles and health trends, using public health information systems for measuring health burden, developing epidemiological profiles and conducting health situation analyses.

PH.340.766. Professional Epidemiologic Methods: Surveillance. 2 Credits.
Covers epidemiological methods and analyses for public health surveillance, including novel measurement approaches for "real and near real time" surveillance, syndrome surveillance and surveillance of public health events. Students learn interpretation of analytic strategies including descriptive and inferential epidemiological methods for surveillance data.

PH.340.767. Professional Epidemiologic Methods: Topics and Methods for Health Situation Analysis. 2 Credits.
Focuses on epidemiological methods and tools used in key health situation analyses. Includes the use of prospective epidemiological scenarios for monitoring health targets and indications. Also covers examples of health priority setting assessments; health needs assessments, and the methods for epidemiological stratification of public health problems. Laboratory exercises provide experience with applying concepts, methods and tools to problems drawn from real epidemiological data and published literature.

PH.340.768. Professional Epidemiologic Methods: Decision Making in Health Situation Analysis. 2 Credits.
Covers advanced health situation analyses for the evaluation of effectiveness of public health programs using real public health scenarios and available health information datasets. Covers selected epidemiological metrics for measuring social health inequalities and methods for informing evidence-based healthcare decision-making using epidemiologic data. Also addresses the role of available epidemiological evidence and translational research for public health programs. Laboratory exercises provide experience with applying concepts, methods and tools to problems drawn from real epidemiological data and published literature.

PH.340.769. Professional Epidemiology Methods. 4 Credits.
Trains future leaders using advanced epidemiological methods applied in modern public health practice, and provides students with the key epidemiological competencies for mid-level and senior-level epidemiologists. Covers examples of health priority assessments, health needs assessments, epidemiological stratification of public health problems, measuring health inequalities and evaluation of effectiveness of public health programs using real public health scenarios and available health information datasets. Also covers selected methods for translating epidemiologic data for decision-making. Addresses the role of available epidemiological evidence and translational research for public health programs.

PH.340.770. Public Health Surveillance. 3 Credits.
Acquaints students with Public Health Surveillance, which is a core public health function essential for understanding and monitoring population health. Covers the theory, data collection methods, data analysis techniques, and presentation strategies of the systematic, continuous, analysis and interpretation of population health data to inform planning, implementation, and evaluation of public health practice. Students identify the different types of surveillance, and how each is applied in varied settings. Practical experiences/labs involve creating data collection tools, and reviewing how they can be applied in practice. Real-world surveillance data is used to illustrate methods for analysis, and how surveillance data should be presented to different audiences. Guests who are coordinating and conducting surveillance in different community settings lead interactive discussion sessions.

PH.340.774. Advanced Theory and Methods in Epidemiology. 4 Credits.
Integrates and extends content taught in the Epidemiologic Methods 340.751-753 sequence. Focuses on the conceptual underpinnings and application of strategies for addressing key methodologic challenges that arise when carrying out epidemiologic research. Incorporates experiential learning components, including a term-long self-directed group research project, and provides resources for students to acquire a working knowledge of how to apply presented methodological tools.

PH.340.775. Measurement Theory and Techniques in Epidemiology. 4 Credits.
Reviews concepts, key assumptions, and published applications of measurement theory, including true scores and counterfactual outcomes, latent variables, and validity. Explores novel applications of item response theory to refinement of measures, assessment of differential item functioning, and calibration of metrics across diverse samples. Topics include analysis of novel types of data (biomarkers, high-dimensional data, administrative records, genetics), item response theory, latent growth curve models for longitudinal data and their extensions, and cross-study statistical harmonization and co-calibration. Draws examples from epidemiologic applications in the behavioral and social sciences. Offers students opportunities for applying lessons from didactic lectures in a laboratory setting using prepared examples.

PH.340.776. Study Design and Analysis for Causal Inference With Time-Varying Exposures. 3 Credits.
Presents a holistic framework for studying causal effects of time-varying exposures. Builds on 140.664 and 340.774 and explores how to articulate causal questions and clarifies assumptions needed to identify the effects of time-varying exposures. Distinguishes total effects of exposures at a given point in time from those that involve cumulative doses or adherence to dynamic treatment rules. Outlines design parameters such as eligibility, start of follow-up, and artificial censoring with data from cohorts or administrative healthcare records. Reviews the motivation, intuition, and application of advanced methods such as time-dependent propensity scores, marginal structural models, and the parametric g-formula to overcome time-varying confounding and selection-bias. Emphasizes practical application and robustness checks, guideposts for choosing among study designs and analytic methods, and comparative strengths for studies with an etiologic vs. translational focus.

PH.340.794. Power and Sample Size for the Design of Epidemiological Studies II. 1 Credit.
Introduces power and sample size (PSS) calculations for the design of more complicated studies, including survival or time-to-event outcomes, cluster randomized trials, studies with correlated outcomes, and non-inferiority trials. Introduces the use of simulation to conduct PSS calculations for the design of special situations where existing PSS tools do not directly apply. Showcases the design and conceptualization processes of real-world examples and how PSS statistical calculations serve as an integral component of the processes.

PH.340.800. MPH Capstone Epidemiology. 2 Credits.
The MPH Capstone is an opportunity for students to work on public health practice projects that are of particular interest to them. The goal is for students to apply the skills and competencies they have acquired to a public health problem that simulates a professional practice experience.

PH.340.802. Expert Searching for High Quality Evidence in The Online Environment. 2 Credits.
Introduces students to effective and efficient searching of the medical literature, in particular the skills and knowledge needed to produce an effective search in support of a systematic review of the medical literature. Discusses existing standards and evidence for these standards. Familiarizes students with software that helps with managing the results of literature searches. Addresses the competencies needed to complete comprehensive, systematic, transparent searches of the literature.

PH.340.803. Advanced Topics in Cardiovascular Disease Epidemiology. 2 Credits.

PH.340.810. Field Placement Epidemiology. 1 - 22 Credits.

PH.340.820. Thesis Research Epidemiology. 1 - 22 Credits.

PH.340.828. Teaching in Epidemiology. 1 - 22 Credits.
Teaching Assistant (TA) for PhD students in Epidemiology

PH.340.830. Postdoctoral Research Epidemiology. 1 - 22 Credits.

PH.340.840. Special Studies and Research Epidemiology. 1 - 22 Credits.

PH.340.841. SS/R Translational Epidemiology. 2 Credits.
Introduces the concept and application of translational epidemiology. Presents a range of topics including communication techniques, giving press releases, use of social media, community engagement, and engaging with policymakers. Introduces related topics like implementation science and public health practice.

PH.340.853. First Year Epidemiology Doctoral Seminar. 1 Credit.
Introduces current discussion, controversies, and applications of epidemiology. Reviews landmark papers and current literature and provides guided discussions of the materials. Focuses on exploring key paradigms that have influenced the field of epidemiology. Includes discussion of current trends influencing epidemiologic research and training, controversies in the assessment of populations and outcomes, and individual-level vs. population-health, among others.

PH.340.855. SS/R: Biological Basis of Cardiovascular Disease Epidemiology. 2 Credits.

PH.340.860. Current Topics in Epidemiologic Research. 1 Credit.
Engages with staff, students, fellows, and faculty in the Department of Epidemiology for exposure to epidemiologic methods as applied in research settings. Provides a broader perspective on contemporary issues in epidemiology and its research, through presentations of current research in the field of epidemiology.

PH.340.861. Clinical Trials: Procedures, Design, and Interpretation of Results. 3 Credits.
Augments Introduction to Clinical Trials (340.645). Describes current standards for clinical trial protocols, consent procedures and describes regulatory requirements and expands upon design and analysis concepts presented in 340.645. Reviews key standards for clinical trial protocols, including the SPIRIT guidelines, recruitment and consent of participants, and principles for data acquisition and sharing. Covers regulatory requirements for drug development and adverse event monitoring as well as the statistical aspects of data monitoring for clinical trials. Provides more in-depth discussion of newer designs for clinical trials including non-inferiority design and adaptive designs. Investigates specific analysis issues for handling missing data, interim monitoring and cost-effectiveness. Addresses the synthesis of results from clinical trials in meta-analyses and the role of post-marketing surveillance in assessing drug safety.

PH.340.863. Doctoral Seminars in Epidemiology. 3 Credits.
Provides an opportunity for doctoral students to discuss challenges in epidemiology and apply methods and principles learned in didactic courses to formulate research questions and specific aims. Participates in the preparation of dissertation proposal components, develop skills to effectively communicate research questions, and critically evaluate the scientific merit of research proposals.

PH.340.865. Teaching Epidemiologic Methods and Concepts At the Graduate Level. 1 - 8 Credits.
Review and evaluate critical skills in teaching and communicating science, epidemiology, methods, and theory to a wide range of individuals. Provides a feedback mechanism for learning best practices in education at the graduate level.

PH.340.871. Welch Center Research Seminar. 1 Credit.
Students, postdoctoral fellows and faculty present contemporary epidemiological research articles, focusing on clinical and cardiovascular epidemiology. Emphasizes presentation skills and the ability to critically evaluate scientific papers. Uses a journal-club format in which one or more papers are distributed in advance. Participants are expected to read and discuss the assigned material. Media reporting/coverage in the lay and medical press is explicitly discussed related to the article. Provides a forum for the discussion of the appropriate use of statistical methods for various study designs.

PH.340.872. Genetic Epidemiologic Seminars in Current Research and Methodology. 1 Credit.
Emphasizes the importance of reading, understanding, and discussing literature. Presents scientific papers from the current literature in genetic epidemiology (students, postdoctoral fellows, and faculty). Provides students the opportunity to interact with faculty regularly. Reviews current topics and methodology in genetic epidemiology with current faculty and research leaders and practitioners.

PH.340.873. Contact Tracing During the COVID-19 Pandemic. 1 Credit.
Provides basic elements and methodology of contact tracing and practical experience by executing these newly learned skills. Reviews current issues and concerns encountered by students. Evaluates and promulgates best practices in contact tracing.

PH.340.874. Current Topics in Human Rights. 1 Credit.
Reviews a common framework for the analysis of comparative effectiveness and safety research CER randomized trials and observational studies, and presents several applications for cardiovascular, renal, and infectious diseases.

PH.340.875. GEM Research Seminar. 1 Credit.
Emphasizes critical evaluation of scientific papers, presentation skills, and open discussion among learners. Uses various session formats, such as a) guided journal-club format in which one or more papers are distributed in advance; b) GEM faculty "mini-talks" introducing broad topics relevant to sub-specialty areas within GEM; c) structured debates and discussions; and d) student presentations of research-in-progress. Expects participants to be prepared for each session, which may include: reading journal articles in advance and responding to Guided Journal Article Review questions (and submitting responses through CoursePlus), or preparing a research-in-progress talk. Intends to be a welcoming and rigorous forum for the discussion of the appropriate use of study designs and statistical methods for answering different types of epidemiology research and practice questions, and the strengths and limitations of various approaches.

PH.340.876. Clinical Trials and Evidence Synthesis Research Seminar. 1 Credit.
Helps achieve CTES-specific competencies and prepares for the written comprehensive and oral examinations. Supports progress on theses and dissertations and provides opportunities for students to interact with CTES faculty and other trialists and evidence synthesis experts. Presents methods and appraises manuscripts addressing clinical trial design, conduct, analysis, and reporting as well as topics related to the synthesis of evidence using systematic reviews and other evidence synthesis products during journal club sessions. Present thesis or dissertation projects during research-in-progress sessions.

PH.340.877. Cancer Epidemiology Prevention and Control Seminars in Current Research and Methodology. 1 Credit.
Emphasizes the importance of reading, understanding, and discussing literature. Presents scientific papers from the current literature in cancer epidemiology (students, postdoctoral fellows, and faculty). Provides students the opportunity to interact with faculty regularly. Reviews current topics and methodology in cancer epidemiology with current faculty, research leaders, and practitioners.

PH.340.895. MPH Practicum: Epidemiology. 1 - 5 Credits.

PH.340.901. Principles of Epidemiology Lab.
Lab for Principles of Epi

PH.340.921. EPIDEMIOLOGIC INFERENCE IN PUBLIC HEALTH I Lab.
EPIDEMIOLOGIC INFERENCE IN PUBLIC HEALTH I LAB

PH.340.951. EPI Methods 1 Lab.
Lab for PH.340.751

PH.340.952. EPI Methods 2 Lab.
Lab for PH.340.752

PH.340.953. Lab for Epi PH.340.753.
Lab for EPI 340.753