

# EPIDEMIOLOGY (EPI)

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## **EPI 805 HUMAN HEALTH AND DISEASE IN PUBLIC HEALTH 3 Credit Hours**

This course is designed to provide graduate students and health professionals with the knowledge of the physiology of the human health and the essential concepts of disease processes. It demonstrates the relevance and application of disease biology knowledge to the epidemiological research and practice. Students will learn how the human physiology works and the changes in pathophysiology. Students will learn specific disorders specifically pathophysiology, etiology, clinical signs, symptoms, and outcomes. Understanding pathophysiology will allow students to comprehend variations in disease burden, distribution and natural history at the individual and population levels. Students will learn about major diseases that have global public health importance.  
Cross List: CPH 605.  
Typically Offered: FALL

## **EPI 808 BIostatISTICS AND EPIDEMIOLOGY IN NURSING PRACTICE 4 Credit Hours**

This course will introduce graduate nursing students to the key concepts of biostatistics and epidemiology. During this course, students will gain the knowledge and skills to conduct and evaluate population health research, identify gaps and inequities in care, and monitor trends in outcomes. Major topics in this course include types of data, descriptive statistics, regression, measures of disease frequency, study designs, measures of effect, surveillance, and screening. By the end of this course, students will be able to inform healthcare decisions to improve community health conduct and evaluate population health using biostatistical and epidemiologic methods taught in this course.  
Prerequisite: Enrolled in a graduate nursing program  
Typically Offered: FALL/SPR

## **EPI 810 EMERGENCY PREPAREDNESS: PREVENTION 3 Credit Hours**

An introduction to emergency preparedness concepts such as the Incident Command System, The National Response Framework, agencies, infrastructures, and assets in place to plan for, and respond to emergencies.  
Cross List: CPH 550.  
Typically Offered: FALL

## **EPI 811 EMERGENCY PREPAREDNESS: PROTECTION 3 Credit Hours**

An introduction to emergency preparedness concepts, in preparation for naturally occurring disasters, intentional acts of terrorism, and new emerging infectious disease threats. Students will explore Critical Infrastructure protection, agriculture, and food safety, surveillance and detection of biological agents among other topics.  
Cross List: CPH 631.  
Typically Offered: FALL

## **EPI 812 CHRONIC DISEASE EPIDEMIOLOGY 3 Credit Hours**

The target audience for this course includes, but is not limited to, student researchers and practitioners in the field of public health. The course will cover risk factors for major chronic diseases such as cancer, diabetes, musculoskeletal disease, and chronic lung disease. Through the course, students will learn advanced concepts and methodology in chronic disease epidemiology research, including disease surveillance and etiologic and outcomes research. Students will also gain experience developing a proposal to conduct an etiological study of a selected chronic disease.  
Prerequisite: EPI 820/CPH 504 BIOS 806/CPH 506.  
Cross List: CPH 620.  
Typically Offered: FALL

## **EPI 813 EMERGENCY PREPAREDNESS: RESPONSE 3 Credit Hours**

An introduction to disaster response-related concepts such as Responder Safety and Health, Citizen Evacuation, Weapons of Mass Destruction, and Medical Surge among other topics.  
Cross List: CPH 553.  
Typically Offered: SPRING

## **EPI 814 EMERGENCY PREPAREDNESS: RESPOND AND RECOVERY 3 Credit Hours**

An introduction to emergency preparedness concepts, focusing on disaster response-related concepts such as Medical Surge, Behavioral Health, and Mass Fatalities, in addition to short and long term disaster recovery topics.  
Cross List: CPH 554.  
Typically Offered: SPRING

## **EPI 820 EPIDEMIOLOGY IN PUBLIC HEALTH 3 Credit Hours**

This course introduces epidemiology as a basic science in public health. Students will gain the fundamental skills to interpret and critically evaluate the literature relevant to public health professionals. The basic principles and methods of epidemiology and their applicability to public health and population health practice and research are established. Measures of disease frequency and association, epidemiologic study designs, bias, confounding, screening, surveillance, and outbreak investigation are covered during the course.  
Cross List: CPH 504  
Typically Offered: FALL/SPR

## **EPI 821 APPLIED EPIDEMIOLOGY 3 Credit Hours**

This course is designed to provide advanced-level graduate students with epidemiologic data analysis, interpretation and presentation skills. The course presents advanced principles and methods of Epidemiology through the use of simulated and actual research data. The course is suitable for both advanced-level master's students and doctoral students in epidemiology and related fields. The primary goal is to provide working knowledge of the fundamentals of epidemiology to graduate students who wish to further their careers in public health research.  
Prerequisite: CPH 628 / EPI 845 Epidemiologic Methods  
Cross List: CPH 621  
Typically Offered: FALL

## **EPI 822 HOST AND PATHOGEN FACTORS IN PUBLIC HEALTH 3 Credit Hours**

Infectious diseases public health threats manifest through interactions between a host (patient or community), a pathogen, the environment, and, in some instances, an additional vector (e.g., mosquito, fomite). In this course, graduate students and public health professionals will learn about host and pathogen factors, and ways in which they are explored and exploited in risk management. This application of microbiology and immunology for the benefit of public health is suitable for all graduate students and health professionals who wish to have experience in the planning of public health risk management of communicable diseases. It also sets the stage for students who plan to undertake a more nuanced study of Infectious Diseases epidemiology methods and applications. Students will read, engage in class and virtual discussions, complete quizzes, write, and present their work.  
Cross List: CPH 622  
Typically Offered: FALL

**EPI 824 INTRODUCTION TO PUBLIC HEALTH INFORMATICS 3 Credit Hours**

This course will introduce graduate students to the key concepts of public health informatics. During this course, the current and future impact of informatics on essential public health services and practices will be explored. Students will learn about informatics concepts and approaches including their role when implementing and operating public health informatics software and information systems. Major topics covered include common public health information systems, data quality, standards, interoperability, electronic health records, syndromic surveillance, health information exchanges, and data governance. Prerequisite: EPI 820/CPH 504 or equivalent  
Cross List: CPH 624  
Typically Offered: FALL

**EPI 825 THEORY AND METHODS OF INFECTIOUS DISEASES EPIDEMIOLOGY 3 Credit Hours**

Infectious diseases are as varied as they are numerous. Yet, core features of any evolving infectious threat determine both spread and the patient and community experience from disease. In this course, graduate students and public health professionals will focus predominantly on the theory, language, and core methods involved in characterizing epidemiologic facets of infectious diseases relevant to further advanced study, health emergency risk management, and myriad roles in the prevention and mitigation of these threats. Students will read, engage in class and virtual discussions, complete quizzes, write, and present their work. Prerequisite: CPH 504/EPI 820, an equivalent epidemiology methods course or permission of instructor.  
Cross List: CPH 623.  
Typically Offered: SPRING

**EPI 826 EPIDEMIOLOGICAL METHODS IN OUTBREAK INVESTIGATIONS 3 Credit Hours**

Disease outbreaks are emergency events that trigger rapid responses by public health officials to save lives and prevent suffering. This course teaches students how to detect, investigate, and control infectious and non-infectious outbreaks through lectures, case studies, and outbreak simulations. Prerequisite: EPI 820.  
Cross List: CPH 630  
Instructor: Patrick Maloney, Ph.D., MPH  
Typically Offered: SPRING

**EPI 835 HEALTH INFORMATION AND SURVEILLANCE FOR PUBLIC HEALTH PRACTICE 3 Credit Hours**

This course focuses on the role of health information and health information systems for the practice of national, state- and community-level public health. Prerequisite: BIOS 806/CPH 506 and EPI 820/CPH 504.  
Cross List: CPH 626.  
Typically Offered: FALL/SPR

**EPI 837 SOCIAL EPIDEMIOLOGY 3 Credit Hours**

The purpose of this course is to introduce students to the major social variables relevant to public health and health outcomes typical of the field of Social Epidemiology. Anticipated topics include: social class, poverty, education and occupation, gender, race, social networks/support, and work neighborhood environments. Pre-req: CPH 504/EPI 820 Epidemiology in Public Health, Cross-listed: CPH 637  
Typically Offered: SPRING

**EPI 845 EPIDEMIOLOGIC METHODS 1 3 Credit Hours**

Topics covered in this course include epidemiologic study designs, quantitative measures of disease frequency and association, threats to validity, and causal inference. The general approach of this course is both theoretical and quantitative, focusing on the investigation of disease etiology and other causal relations in public health. The course is offered in a format built around lectures, group discussions, and analyses of epidemiologic data. Prerequisite: CPH 506/BIOS 806 Biostats I; CPH 504/EPI 820 - Epidemiology; CPH 651/BIOS 810 - Intro to SAS Strongly recommended.  
Cross List: CPH 628.  
Typically Offered: FALL

**EPI 896 RESEARCH OTHER THAN THESIS IN EPIDEMIOLOGY 1-4 Credit Hours**

This course is for more advanced students who wish to pursue their research interests. Cross List: CPH 647.  
Typically Offered: FALL/SP/SU

**EPI 898 SPECIAL TOPICS IN EPIDEMIOLOGY 1-4 Credit Hours**

A course designed for Masters students that focuses on selected topics or problems in Epidemiology. Cross List: CPH 649  
Typically Offered: FALL/SPR

**EPI 899 MASTERS THESIS 1-9 Credit Hours**

Independent student research related to the masters thesis. Typically Offered: FALL/SP/SU

**EPI 910 RESEARCH GRANT PROPOSAL DEVELOPMENT 3 Credit Hours**

This course offers graduate students and health professionals a practical experience writing a research grant proposal for submission to the National Institutes of Health (NIH). Students will learn how to formulate research questions, develop study aims, and build research designs closely tied to analysis plans and research outcomes. Students will learn how to find and respond to various federal and non-federal funding mechanism opportunities. Students will participate in a mock NIH study section, during which they will learn the NIH peer review process and they will critique research grant proposals. Throughout the course, students will work interactively with faculty members who have successfully served as principal investigators and co-investigators of multiple federally-funded research proposals or contracts in different disciplines. Prerequisite: EPI 820 or equivalent introductory epidemiology course, BIOS 806 or equivalent introductory biostatistics course. Crosslisted: CPH 710.  
Typically Offered: SPRING

**EPI 924 INFECTIOUS DISEASE MODELING 3 Credit Hours**

This course is designed for graduate students and health professionals interested in utilizing mathematical models to predict communicable disease transmission and epidemic dynamics. The knowledge and skills acquired in this course will help students in designing strategies to mitigate infectious disease epidemics. Pre-reqs: CPH 623/ EPI 825 or equivalent infectious disease methods courses. Cross-listed: CPH 724  
Typically Offered: FALL

**EPI 925 THE PRACTICE OF INFECTIOUS DISEASE EPIDEMIOLOGY 3****Credit Hours**

This course is designed to provide practical experience to students obtaining a PhD degree in Epidemiology with a concentration in Infectious Diseases (It may, however, be taken as an elective by doctoral-level students in other areas of concentration within the College of Public Health) As such, it covers practical problems which might arise in the practice of infectious disease epidemiology and is designed to prepare students about to embark on "real-world" careers with local and state health departments, clinical institutions, NGOs, and industry. These problems include (but are not limited to): bioterrorism preparation and response; planning for and managing patients with highly hazardous communicable diseases; implementing immunization programs; instituting and managing infection control and antibiotic stewardship programs; implementing isolation and quarantine orders; crafting patient safety initiatives; and overseeing quality assurance and laboratory management programs.

Prerequisite: CPH 504/EPI 820 Crosslisted: CPH 725.

Typically Offered: FALL

**EPI 928 DISASTER EPIDEMIOLOGY 3 Credit Hours**

This course is designed to prepare the graduate student, professional student, or fellow to apply principles and methods of disaster epidemiology to their own practice. Major topics to be covered include opportunities and barriers to conducting epidemiologic studies during disasters, ethical considerations and assuring justice, equity, diversity and inclusion for vulnerable populations, epidemiologic methods that can be used for disaster epidemiologic studies. By the end of the course, the participant will be facile in initiating studies and understanding the results from epidemiologic studies during disasters.

Prerequisite: Epi 820/CPH 504 Epidemiology in Public Health

Cross List: CPH 728

Instructor: Julie Casani

Typically Offered: FALL

**EPI 941 EPIDEMIOLOGIC METHODS IN APPLIED CLINICAL GENETICS 3****Credit Hours**

This course is designed to prepare the graduate student on the theory and methods of genetic epidemiology of complex diseases using association studies. Major topics including: Mendelian inheritance, design strategies for genetic association studies, bias in genetic studies and population stratification, SNP selection, genotype diplotype and haplotype analyses, linkage disequilibrium, Hardy-Weinberg equilibrium (HWE), gene by environment interactions, power analysis, clinical review of genetic association manuscripts, and hands-on analysis using statistical and specialized genetics software..

Prerequisite: EPI 820, BIOS 806 and knowledge of a statistical package (SAS or SPSS) or instructor permission.

Typically Offered: SUMMER

**EPI 945 ANALYTICAL EPIDEMIOLOGIC METHODS 3 Credit Hours**

This course is designed primarily for graduate and professional students interested in performing analyses of epidemiologic data. Topics include analyses of multinomial and longitudinal data, multiple imputation, Poisson regression, and meta analysis. Students will practice their skills by performing SAS analyses of simulated and actual research data. Prerequisite: Epidemiology in Public Health (CPH504/EPI 820); Applied Epidemiology (CPH 621/EPI 821); Epidemiologic Methods (CPH628/EPI845); Biostatistics I (CPH 506/BIOS 806); Biostatistical Methods II (CPH 652/BIOS 818); Categorical Data Analysis (CPH 653/BIOS 823) and Introduction to SAS Programming (CPH 651/BIOS 810). Students should consult their academic advisor if other coursework or experience qualifies as a prerequisite.

Corequisite: Correlated Data Analysis (CPH 655/BIOS 825)

Instructor: Abraham Mengist

Typically Offered: FALL

**EPI 946 EPIDEMIOLOGY IN PUBLIC HEALTH PRACTICE 3 Credit Hours**

This course provides students the opportunity to explore public health problems and issues - such as infectious diseases, chronic diseases and preparedness - through the lens of epidemiology. By applying the concepts learned throughout their program coursework to current public health problems and issues, students will understand the practice of epidemiology as it relates to real life and informs public health programs and policies. This course is intended primarily for doctoral students in epidemiology and public health to apply their training to public health practice and research.

Prerequisite: EPI 845 (Epidemiologic Methods) or equivalent epidemiologic methods courses

Typically Offered: SPRING

**EPI 952 MENTAL HEALTH EPIDEMIOLOGY 3 Credit Hours**

In this on-campus course, students will learn about epidemiology of major mental and substance use disorders, critically review the published epidemiology studies on mental and substance use disorders, and develop a proposal to evaluate a population-based intervention program to prevent and control a mental or substance use disorder. The course will promote active learning and prepare students for real-world experience. This is an advanced-level epidemiology class for students, researchers, and practitioners in public health, medicine, nursing and other health science disciplines who completed EPI 820 (or equivalent) and EPI 845 (or equivalent).

Prerequisite: EPI 820 and EPI 845.

Cross List: CPH 752

Typically Offered: SPRING

**EPI 953 CANCER EPIDEMIOLOGY 3 Credit Hours**

The course covers the main concepts in cancer epidemiology, such as cancer incidence and mortality trends, cancer etiological factors, cancer prevention and control. Students will apply epidemiology research methods to the field of cancer and will learn how to identify research gaps and address them using epidemiology methods. In addition, the students will understand how cancer epidemiology contributes to policies that ultimately contribute to cancer prevention.

Cross List: CPH 753

Typically Offered: SPRING

**EPI 955 ENVIRONMENTAL EPIDEMIOLOGY 3 Credit Hours**

The course is designed to provide an advanced discussion of the epidemiology of environmentally-related disease and the application of epidemiologic concepts and methods to protecting public health from environmental hazards. Substantive topics include important environmental exposures; these are used to illustrate exposure assessment methodology, the dynamic nature of environments, the strengths and limitations of epidemiologic designs and the impact of regulation of environmental hazards in public health.

Prerequisite: EPI 821, BIOS 806 and ENV 816, or instructor permission.

Cross-listed: CPH 755.

Typically Offered: SUMMER

**EPI 957 SURVEY RESEARCH METHODS 3 Credit Hours**

This course is designed to prepare the graduate students and working professionals with a strong foundation in survey research methodology. This is a comprehensive course covering the design, implementation, analysis, interpretation, and reporting of epidemiologic survey results. The course includes hands-on experience with data analysis using SAS. In this course, students will also learn to search, access and analyze data from national surveys to conduct epidemiologic studies. Upon completion of the course, students are expected to be able to design and analyze surveys to address particular research questions or evaluate public health policy.

Prerequisite: Epidemiologic Methods (EPI 845), Biostatistics (CPH 506/ BIOS 806) and Introduction to SAS Programming (CPH 651/ BIOS 810).

Students should consult with their advisor if other coursework or experience qualifies as prerequisite. Crosslisted: CPH 757

Typically Offered: FALL

**EPI 958 EPIDEMIOLOGIC ANALYSIS OF HEALTHCARE DATA 3 Credit Hours**

This course is designed for graduate and health professions students interested in analyzing healthcare data for epidemiologic and clinical research. Students will learn the unique challenges and opportunities of working with insurance claims data, electronic health records, national surveys and national registries. Students will also learn to use Geographic Information System (GIS) approaches to link social determinants of health and clinical outcomes. Students will practice their skills by performing hands-on analyses of simulated and actual research data. Upon completion of this course, students should be equipped with the tools necessary to analyze healthcare data and apply the results to address health care and public health challenges.

Prerequisite: CPH 621, CPH 506, CPH 651.

Typically Offered: FALL

**EPI 960 EDUCATION THEORY AND APPLICATION 3 Credit Hours**

This course introduces the Ph.D. student to basic pedagogy, teaching skills, and strategies necessary to meet the professional demands of teaching at the university level. Major topics covered are learning theory, pedagogy, andragogy, educational philosophies, instructional design, inclusiveness, content delivery, assessment creation, teaching methods and instructor engagement.

Prerequisite: EPI 820 or instructor permission. Crosslisted: CPH 760

Typically Offered: FALL

**EPI 970 SEMINAR 1 Credit Hour**

A series of scientific sessions on current topics exploring advanced concepts and methods in epidemiology. The course will promote the development of knowledge of epidemiologic methods, analytic approaches, disease etiology, natural history, and current issues related to the application of these concepts for conducting epidemiologic research and practice.

Prerequisite: Standing as a doctoral student in epidemiology.

Typically Offered: FALL/SPR

**EPI 996 DIRECTED READINGS AND RESEARCH 1-9 Credit Hours**

This course is specific to doctoral level work in the College of Public Health. Content of this independent study may include research other than dissertation, directed readings, and other study of a doctoral level all under the supervision of a graduate faculty member.

Prerequisite: Doctoral student status and program permission.

Typically Offered: FALL/SP/SU

**EPI 998 DOCTORAL SPECIAL TOPICS 1-4 Credit Hours**

A course designed for Epidemiology PhD students and other graduate students that focuses on selected topics or problems in Epidemiology.

Prerequisite: Permission of instructor.

Typically Offered: FALL/SP/SU

**EPI 999 DOCTORAL DISSERTATION 1-15 Credit Hours**

The dissertation represents original and significant research on a defined epidemiological problem. This research is the culmination of a training process designed to ready the student to do independent research including development of a research question, data collection, analysis and interpretation.

Prerequisite: Permission of instructor.

Typically Offered: FALL/SP/SU