

EPIDEMIOLOGY (EPID)

EPID 548. Applied Data Analysis Lab. 3 Hours.

Semester course; 3 laboratory hours. 3 credits. Prerequisite: BIOS 543 with a minimum grade of B. Corequisite: BIOS 544. Enrollment is restricted to graduate students in the Master of Public Health program; other graduate students may enroll with permission of instructor and program administrator. Lab sessions will focus on hands-on data analysis and presentation techniques using SAS statistical software. Techniques and approaches include basic SAS principles such as data manipulation, descriptive procedures, testing, data visualization, linear and logistic regression, model building, Poisson regression and survival analysis. The labs will also provide exercises to help students more fully understand the statistical principles presented in the corequisite biostatistics lecture course.

EPID 571. Principles of Epidemiology. 3 Hours.

Semester course; 3 lecture hours (delivered online, face-to-face or hybrid). 3 credits. Offers the theoretical foundations, concepts and principles of epidemiological research methods utilized to examine the distribution and determinants of diseases or other health problems. Entails understanding of measures of disease frequency and association, descriptive and analytic studies, community surveys, sampling, bias, confounding surveillance, outbreak investigation, screening and research proposal writing. Also provides basic foundations for data analysis and its translation into health care planning, management and policy formulation.

EPID 606. Epidemiologic Methods. 3 Hours.

Semester course; 3 lecture hours (delivered online, face-to-face or hybrid). 3 credits. Prerequisites: BIOS 543, EPID 548 and EPID 571, all with minimum grade of B. Focuses on examining the design, conduct and analysis of major epidemiologic studies and the methods to deal with the problems of bias, confounding and effect modification; using multivariate modeling techniques to build logistic regression and Cox proportional hazards models to answer relevant research questions; solving meta-analytic problems using fixed and random effects models; understanding specific research areas of disease screening and exposure assessment; writing a research paper based on literature review and data analyses of a large dataset demonstrating application of essential epidemiologic and biostatistical principles.

EPID 620. Cancer Epidemiology. 3 Hours.

Semester course; 3 lecture hours (delivered online, face-to-face or hybrid). 3 credits. Prerequisites: EPID 571 and BIOS 543, both with a minimum grade of B. Enrollment is restricted to students in the Ph.D. in Epidemiology or the Master of Public Health programs. Students review the epidemiology of major cancers by anatomic site and discuss seminal studies and current issues in cancer epidemiological research, including methodology, cancer surveillance, international studies, observational studies and intervention trials. The course will include an overview of basic concepts pertinent to cancer epidemiology research and prevention including biology, descriptive statistics, risk factors and genetics. Selected publications from epidemiological literature provide examples for student-faculty discussion.

EPID 622. Maternal and Child Health. 3 Hours.

Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 548, EPID 571 and BIOS 543, all with minimum grades of B; or permission of instructor. Exposes students to current issues in maternal and child health in the U.S., taking an applied approach that balances discussion of literature, applications to public health practice and practical data experience. The course will explore how policies and social determinants of health influence MCH outcomes. Students will learn about key MCH topics including intergenerational risk factors, low birth weight, infant mortality, developmental disabilities and injury and violence prevention. Students will use epidemiological methods to evaluate MCH data to determine risk and protective factors for women and children and describe how these data guide public health policy and program-planning efforts.

EPID 623. Injury and Violence Epidemiology. 3 Hours.

Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 548 and EPID 571, both with a minimum grade of B. Enrollment is restricted to majors in public health and epidemiology; others by permission of instructor. This course will introduce students to current issues and methods in injury and violence epidemiology using primarily a domestic focus. Students will learn about key injury-related topics, including motor vehicle traffic crashes, drug overdoses, drowning, traumatic brain injuries, suicide and self-harm, homicide/assault, and intimate partner violence, with an emphasis on methods commonly used to conduct surveillance and analyze data, as well as related prevention strategies and theories of causation. Students will be able to describe how epidemiological methods are used to determine incidence and prevalence within populations, identify risk and protective factors, and describe how injury and violence surveillance data guide public health policy and program planning efforts.

EPID 624. Chronic Disease Epidemiology. 3 Hours.

Semester course; 3 lecture hours. 3 credits. Prerequisite: EPID 571 with a minimum grade of B or permission of the instructor. Course will cover the contribution of chronic diseases to population disease and disability as well as identify the incidence, prevalence and financial impact of each of the model diseases addressed. At the conclusion of the course, the student should be able to apply the concepts to all chronic diseases. The student will analyze selected current research in the area and determine points at which translational research is likely to improve the ability of the health care system to manage these problems.

EPID 626. Environmental Epidemiology. 3 Hours.

Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571 and BIOS 543 with a minimum grade of B. Enrollment is restricted to graduate students. Students will gain an understanding of epidemiologic methods specific to Environmental Health. The course provides a conceptual framework for the study of health effects in populations resulting from exposure to physical, chemical, and biological agents. This includes the contribution of health effects of water and air pollution, radiation threats and exposures, social, economic, and cultural factors (e.g., urbanization, transportation, agriculture, manufacturing, energy production) related to those exposures. The goal of this course is for students to develop a current understanding of the relationships between environmental exposures and health outcomes through the use of epidemiologic methods and provides the opportunity for students to focus in-depth on a particular area of interest.

EPID 627. Nutritional Epidemiology. 3 Hours.

Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571 and BIOS 543 with a minimum grade of B. Enrollment is restricted to students in the Ph.D. in Epidemiology and Master of Public Health programs or by permission of the instructor. Designed to introduce epidemiology methods in nutrition research to graduate students. Specifically, the course will cover the complex nature of diet and nutrition and epidemiological methods that address challenges, the epidemiological approaches to understand the relationship between nutrition and diseases, and the interpretation and application of epidemiological data in real-world problems. The course will integrate information from international studies, secular and longitudinal trends, clinical trials and analytical epidemiology.

EPID 628. Public Health Program Planning and Evaluation. 3 Hours.

Semester course; 3 lecture hours. 3 credits. Prerequisites: EPID 571 and EPID 593. Enrollment is restricted to graduate students in any concentration within the Master of Public Health program; other graduate students may enroll with permission of instructor and program administrator. This course provides an overview of the process of public health program planning, including assessment, design, planning, implementation and evaluation. Students examine the methods frequently used to determine whether health-related programs are achieving their objectives. Students will gain practical experiences through a series of in-class and team-based exercises and will leave the course with an understanding of how to implement public health programs and evaluate their effectiveness.

EPID 629. Data Management and Visualization. 3 Hours.

Semester course; 3 lecture hours (delivered online, face-to-face or hybrid). 3 credits. Prerequisites: EPID 571 and BIOS 543 with a minimum grade of B. Enrollment is restricted to graduate students. The goal of the course is to provide students with the knowledge, skills and experiences needed to thrive in an applied public health setting. Students will receive hands-on guided experience with software commonly used in public health settings.

EPID 645. Public Health Genomics. 3 Hours.

Semester course; 3 lecture hours. 3 credits. This course provides an overview on the influence of genetic and environmental factors and their role in population health. Students will learn fundamental concepts in genetics and genomics, including advances in genomic technologies, and examine the challenges of integrating genetic and genomic technologies into clinical practice and public health and the impact of such applications on society. Learning approaches will include didactic lectures, case studies, readings, practical activities and an exploration of genomic test results.

EPID 646. Epidemiology of Psychiatric and Substance Use Disorders. 3 Hours.

Semester course; 2 lecture and 1 laboratory hours. 3 credits. This course is intended to introduce the descriptive and analytic epidemiology for major mental disorders of childhood, adulthood and late adult life. The course will address three main topics: (1) conceptual and methodological considerations in psychiatric epidemiologic research, (2) the descriptive epidemiology of major psychiatric and substance use disorders and (3) the analytic epidemiology of major psychiatric and substance use disorders. The course will also examine issues of classification and the nosology of psychiatric disorders as well as operational case definitions and the measurement techniques for field surveys and risk-factor research. Students will become familiar with epidemiologic surveys appropriate for risk factor research for psychiatric and substance use disorders. Prerequisite for master's students: EPID 571 with a minimum grade of B; prerequisite for doctoral students: EPID 650 with a minimum grade of B; or permission of instructor.

EPID 649. Analysis of Health Datasets. 3 Hours.

Semester course; 3 lecture hours. 3 credits. Corequisites: EPID 650 and STAT 643, or permission of instructor. Epidemiologic research, health services research and social/behavioral science research very often conduct "secondary analysis" of existing population-level datasets, as well as different forms of health care data (claims data, electronic prescribing data, electronic medical records). At the end of the course, students will be familiar with the scope of available large, population-based public datasets for health care and public health research. They will understand the strengths and limitations of using these datasets for secondary research and be able to apply this understanding to decisions regarding research questions, dataset use and analysis plans. In the process, they will also develop skills in manipulating complex administrative data sources (including claims data, electronic prescribing data and electronic medical records). Students will acquire knowledge to deal with potential challenges in implementing case-control or cohort studies based on data collected for reasons other than for research. Competencies in sampling methods, weighting, small area estimation techniques, probabilistic matching, multiple imputation methods, geocoding and other issues will be emphasized. Students will download, link and analyze several data sets to understand the advantages of these data. Familiarity with statistical analysis software is required.

EPID 650. Epidemiologic Methods for Research. 3 Hours.

Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to students in the doctoral program in epidemiology; other doctoral students require permission of the instructor. Students will learn principles of epidemiologic methods and their application for analysis and interpretation of public health data. This course provides advanced introductory training for conducting epidemiologic investigations of disease etiology, surveillance and health care services, as well as for interpretation of published epidemiologic studies. Upon completion, students should be sufficiently familiar with epidemiologic research methods to begin applying these methods in their own work. The course is intended for doctoral students in epidemiology or related disciplines.

EPID 651. Intermediate Epidemiologic Methods for Research. 3 Hours.

Semester course; 3 lecture hours. 3 credits. Prerequisite: EPID 650, minimum grade of B. Course will provide in-depth understanding of epidemiologic methods and their application for analysis and interpretation of public health data. This course emphasizes decision-making in research methods to increase the efficiency of study design by reducing bias. Students will gain expertise in methodologic thinking as applied to their own work. Nonexperimental study designs are the focus of the class. Course provides opportunities for students to develop expertise in reading epidemiologic methods research. Upon completion, students should have attained expertise in epidemiologic research methods to apply in their own work. The course is intended for doctoral students in epidemiology or related disciplines.

EPID 652. Advanced Epidemiologic Methods and Data Analysis. 3 Hours.

Semester course; 3 lecture hours. 3 credits. Prerequisites: BIOS 573 or BIOS 602; and EPID 651, both with a minimum grade of B. Focuses on development of analytical strategies for data analysis guided by epidemiologic principles. Specific statistical modeling will be tailored for analysis of data from cross-sectional, case-control and cohort studies with emphasis on causal inference, prediction, controlling for confounding and assessment of interaction and intermediate effects. Course topics include logistic regression, Poisson regression, Cox proportional hazards model, propensity score method, generalized estimating equations and path analysis technique.

EPID 690. Journal Club. 1 Hour.

Semester course; 1 lecture hour. 1 credit. Talks given by students and faculty describing and critiquing recent published research or review articles. Graded as S/U/F.

EPID 691. Special Topics. 1-6 Hours.

Semester course; variable hours. 1-6 credits. This course provides the opportunity for students to focus in depth on a particular area of interest and allows students to tailor their education to their specific needs and interests. Such flexibility adds strength to the program and promotes the independence of dedicated students. Arrangements are made with the appropriate faculty member.

EPID 692. Independent Study. 1-6 Hours.

Semester course; variable hours. 1-6 credits. Provides the opportunity for students to explore a topic of interest under the direction of a faculty member. A proposal must be submitted for approval and credits are assigned commensurate with the complexity of the project. Arrangements are made directly with the appropriate faculty member and graduate program director.

EPID 696. Special Topics. 1-3 Hours.

Semester course; 1-3 variable hours. 1-3 credits. Provides the opportunity for students to focus in depth on a particular area of interest and allows students to tailor their education to their specific needs and interests. Such flexibility adds strength to the program and promotes the independence of dedicated students. Arrangements are made with the appropriate faculty member. Graded as S/U/F.

EPID 697. Directed Research in Epidemiology. 1-18 Hours.

Semester course; 1-18 research hours. 1-18 credits. May be repeated for a maximum of 18 credits. Students will engage in research leading to a Doctor of Philosophy in Epidemiology. Graded as S/U/F.

EPID 898. Directed Research in Epidemiology. 1-9 Hours.

Semester course; 1-9 research hours. 1-9 credits. May be repeated for a maximum of 18 credits. Enrollment is restricted to students in the Ph.D. in Epidemiology program who have completed all other required coursework and have passed a written comprehensive exam and oral dissertation. Students must be continuously enrolled in the course until successful dissertation defense. Graded as S/U/F.