A Multi-disciplinary Approach to Problems in Global Public Health and Epidemiology
Fall. 3(3-0) P: Open to undergraduate students in the Global Public Health and Epidemiology Minor or approval of department.

Overview of global health and the role of epidemiology in studying health problems from a multi-disciplinary perspective.

Applied Analytic Methods in Health Studies I
Spring. 3(3-0) P: (EPI 200) and (STT 200 or STT 201 or STT 224 or STT 231 or STT 315 or STT 351 or STT 421) R: Open to undergraduate students in the Global Public Health and Epidemiology Minor or approval of department.

Introduction to conceptual and analytical methods used in Public Health and Epidemiology. Programming, statistical techniques, and interpretation of health data.

Independent Study
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.

Faculty supervised, intermediate-level, planned learning for an individual student in areas supplementing regular course offerings.

History of Scientific Reasoning and Critical Thinking in Global Public Health and Epidemiology
Spring. 3(3-0) P: EPI 200 R: Open to undergraduate students in the Global Public Health and Epidemiology Specialization.

Introduction to the historical development of public health and epidemiology and how social and scientific contexts shape scientific theories of disease distribution.

Applied Analytic Methods in Health Studies II
Fall. 3(3-0) P: EPI 280 R: Open to undergraduate students in the Global Public Health and Epidemiology Minor or approval of department.

Topics in conceptual and analytical methods used in Public Health and Epidemiology. Continuation of EPI 280.

Disease in Society: Introduction to Epidemiology and Public Health
Spring. 4(4-0) Interdepartmental with Social Science. Administered by Epidemiology.

Human epidemiology and population health issues facing contemporary society. Developed and less-developed settings. Health-related information in the mass media and scholarly publications.

Bayesian Statistical Methods
Fall. 3(3-0) A student may earn a maximum of 0 credits none Interdepartmental with Statistics and Probability. Administered by Statistics and Probability. P: STT 442


Independent Study
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.

Faculty supervised, intermediate-level, planned learning for an individual student in areas supplementing regular course offerings.

Advanced Topics/Methods in Global Public Health and Epidemiology
Fall. 3(2-2) P: EPI 390 and EPI 200 and EPI 290 R: Open to undergraduate students in the Global Public Health and Epidemiology Specialization.

Conceptual and analytical methods used in public health and epidemiology.

Epidemiology and Behavioral Health in Society
Summer. 3(3-0) A student may earn a maximum of 12 credits in all enrollments for this course. R: Open to juniors or seniors or graduate students.

Introduction to epidemiology as applied to behavioral health issues in contemporary society. Life-span developmental perspective from preterm births to late life Alzheimer's disease and the dementias.

Information Management: Fundamentals of Epidemiology and Biostatistics
Spring. 1(1-0) RB: Undergraduate statistics. R: Open to graduate-professional students in the College of Human Medicine.

Introduction to accessing, analyzing, and applying information to patients and to populations. Offered first ten weeks of the semester.

Information Management: Applications of Epidemiology and Biostats
Fall. 1(1-0) P: EPI 546 RB: Undergraduate statistics. R: Open to students in the College of Human Medicine or approval of department.

Basic competency in accessing, analyzing, and applying information to patients and populations. Offered first half of semester.

Readings in the Historical Roots of Epidemiological Thought
Fall. 3(3-0) Interdepartmental with History. Administered by Epidemiology. P: EPI 810 or approval of department R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department.

Historical evolution of models of disease causation and population perspectives on disease.

Biostatistics I
Fall. 3(3-0) Interdepartmental with Statistics and Probability. Administered by Epidemiology. RB: College-level algebra. R: Open to master's students or doctoral students in the Epidemiology major or approval of department. SA: STT 425

Applications of probability and statistics in the applied health sciences. Probability distributions, estimation and tests for one-, two-, and paired samples, linear regression, correlation, and ANOVA. Use of statistical software. Critical appraisal of statistical methods in the biomedical literature.

Advanced Biostatistics
Fall. 3(3-0) P: EPI 810 or concurrently or approval of department RB: Linear algebra, calculus. R: Open to graduate students in the Biostatistics Major or in the Epidemiology Major or approval of department.

Fundamental theory of probability and statistical inference related to the practice of public health. Discrete and continuous random variables, sampling distributions, parametric point and interval estimation, hypothesis testing, maximum likelihood estimation, methods of constructing test and estimation procedures. Sample size, power, and efficiency.

Biostatistics II
Spring. 3(3-0) Interdepartmental with Statistics and Probability. Administered by Epidemiology. P: EPI 808 RB: MTH 103 or MTH 110 or MTH 116 R: Open to master's students or doctoral students in the Epidemiology major or approval of department. SA: STT 426

Analysis of categorical data in epidemiologic studies. Contingency tables and logistic regression.

Introductory Epidemiology
Fall. 3(3-0) R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. SA: HM 810

Disease from a population perspective as the interaction of host, agent, and environment. Case definition, measuring frequency of disease, mortality and morbidity data, and major study designs. Offered first half of semester.

Causal Inference in Epidemiology
Fall. 3(3-0) P: EPI 810 RB: LCS 829 R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. SA: HM 812

Causality in epidemiology. Application of theoretical concepts to the design, analysis, and assessment of epidemiologic research.

Epidemiology of Cardiovascular Disease
Spring of even years. 3(3-0) RB: EPI 810 R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. SA: HM 815

816 Perinatal Epidemiology
Spring of even years. 3(3-0) RB: EPI 810 R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. SA: HM 816
Epidemiology of adverse health states in pregnancy and the puerperium. Impact of these health states on subsequent child development.

817 Epidemiology of Communicable Diseases
Fall. 3(3-0) P: EPI 810 or concurrently R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. SA: HM 817
Application of principles of epidemiology to research in communicable diseases relevant to public health in the U.S. and other countries.

819 Spatial Epidemiology and Medical Geography
Spring. 3(3-0) Interdepartmental with Geography. Administered by Epidemiology. P: EPI 810 or GEO 865 R: Open to graduate students in the Department of Epidemiology and Biostatistics or in the Department of Geography or approval of department. SA: HM 819
Concepts, techniques, and utilization of spatio-epidemiologic analyses for human health.

823 Cancer Epidemiology
Spring of odd years. 3(3-0) P: (EPI 810) and (EPI 809 or EPI 808B) R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. SA: HM 823

826 Research Methods in Epidemiology
Fall. 3(3-0) P: EPI 809 R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. SA: HM 826
Analyses of epidemiologic and clinical data applying statistical methods, based on logistic and survival models, using standard software.

826B Categorical Data Analysis
Spring. 3(3-0) P: EPI 808B and EPI 810 RB: Knowledge of research design and quantitative background. R: Open to graduate students in the Biostatistics Major or in the Epidemiology Major or approval of department.
Applications to real data from clinical and epidemiologic studies of categorical outcomes, distributions for categorical responses and contingency tables, logistic regression and related logit models for binary and multicategory response variables, repeated and clustered categorical data, generalized linear mixed models.

828 Seminar in Responsible Conduct of Research
Fall. 1(1-0) P: EPI 810 SA: EPI 827
Ethical and regulatory issues in the responsible conduct of epidemiology research. Topics include informed consent; scientific misconduct; human subjects protection; responsible data management including electronic medical records, biological samples and genetic data; HIPAA compliance; and other current issues of scientific integrity.

829 Design and Conduct of Epidemiological Studies and Clinical Trials
Spring. 3(2-2) Interdepartmental with Large Animal Clinical Sciences. Administered by Large Animal Clinical Sciences. P: (VM 533 or EPI 810) and (EPI 808 or EPI 808B)

835 Neuroepidemiology
Fall of odd years. 3(3-0) Interdepartmental with Neurology and Ophthalmology. Administered by Epidemiology. P: EPI 810 or approval of department R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department.
Epidemiology of neurologic and neuropsychiatric disorders with emphasis on neurodegenerative disorders (e.g., Alzheimer's disease).

836 Practicum in Epidemiological Methods
Fall. 3(3-0) P: (EPI 812 or concurrently) and (EPI 826 or concurrently) R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department.
Data management, analysis, interpretation and presentations using public data sets.

840 Clinical Epidemiology for Healthcare Practice
Spring. 3 credits. R: Approval of department.
Introduction to clinical epidemiology and evidence-based medicine for clinical practitioners and other healthcare professionals.

847 Analysis of Survival Data
Spring of odd years. 3(3-0) Interdepartmental with Statistics and Probability. Administered by Statistics and Probability. RB: STT 422 or STT 442 or STT 862

851 SAS Programming I: Essentials
Fall. 1(1-0) R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department.
A programming approach to plan and write simple SAS programs to solve common data management and data analysis problems.

852 SAS Programming II: Data Management and Analysis
Spring. 1(1-0) P: EPI 851 R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department.
A programming approach to plan and write SAS programs to solve common data management and data analysis problems.

853B Statistical Computing
Fall. 3(3-0) P: EPI 808B and EPI 826B R: Open to graduate students in the Biostatistics Major or in the Epidemiology Major or approval of department.
Statistical computation and algorithms using programming languages, SAS/IML, R and/or Stata, Newton-Raphson method, Monte Carlo simulation of probability distributions, bootstrap, statistical graphics.

855 Biostatistical Modeling in Genomic Data Analysis
Fall. 3(3-0) P: (EPI 808B and EPI 826B) or (EPI 826 or concurrently) R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department.
Introduction to fundamental principles and modeling of genomic and genetic data and computational techniques.

856 Clinical Trials
Spring. 1(1-0) P: (EPI 826B or EPI 826) and (LCS 829 or concurrently) R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department.
Critical appraisal of applied epidemiological studies, use of real applications to solve design and data analysis problem, and communication of findings to public health researchers, oral/written reports on intermediate and final results of case studies

860 Advanced Inference for Biostatistics
Fall. 3(3-0) RB: Masters in statistics or biostatistics R: Open to doctoral students in the Department of Epidemiology and Biostatistics or approval of department.
Statistical inference problems with biomedical applications.

880 Select Topics in Biostatistics
Summer. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P: (EPI 808B) or (EPI 808 and EPI 809) or (PHM 830 or STT 464) R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department.
Select topics in biostatistics including global disease distribution and estimation, causal inference, Bayesian methods in health services research.
Identification and conceptualization of public health missing data. Design including the role of chance, bias, and misclassification. Real case studies are used to analyze study rounding the use of humans in epidemiological research. Evaluation of validity and appropriate data sets. Interpretation of appropriate problems. Generation of testable hypotheses and epidemiology applications.

Independent Study in Epidemiology and Biostatistics
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 12 credits in all enrollments for this course. RB: EPI 810 R: Open to master's students in the Department of Epidemiology and Biostatistics. Approval of department. Independent study in areas relevant to epidemiology and biostatistics.

Master's Thesis Research
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open to master's students in the Department of Epidemiology and Biostatistics. Approval of department. SA: HM 899 Master's thesis research.

Themes in Contemporary Epidemiology
Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. RB: Master of Science in Epidemiology R: Open to doctoral students in the Epidemiology major. Discussion and critique of important contemporary themes in epidemiology as reflected in current publications in the field.

Advanced Methods in Epidemiology and Applied Statistics
Spring. 3(3-0) Interdepartmental with Statistics and Probability. Administered by Epidemiology. P: EPI 826B or concurrently) or EPI 826 R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. Pattern recognition and cluster analysis, longitudinal data analysis, path analysis, repeated measures and time-series analysis.

Research Seminar
Summer. 3(3-0) P: EPI 810 and EPI 812 and LCS 829 RB: Master of Science in Epidemiology or equivalent. Conceptualization, development, and writing of research proposals in epidemiology and other forms of clinical field research.

Advanced Biostatistical Methods in Epidemiology
Fall of even years. 3(3-0) P: (EPI 826 or concurrently) or EPI 826B RB: Calculus, linear algebra, regression, experimental designs. R: Open to students in the Department of Epidemiology and Biostatistics or approval of department. Study of specific biostatistical methods and epidemiology applications.

Duration and Severity Analysis
Spring of odd years. 3(3-0) P: (EPI 826 or concurrently) or EPI 826B: Calculus, linear and logistic regressions. R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. Analysis of data that involve time to occurrence of a single event or multiple durations between occurrences of several events; modeling techniques; survival analysis in clinical and public health studies; frailty models; experimental and non-experimental applications using major statistical software.

Analytical Strategies for Observational Studies
Fall of odd years. 3(3-0) P: (EPI 826 or concurrently) or EPI 826B: Calculus, linear and logistic regressions: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. Models and methods such as propensity scores, instrumental variables, regression discontinuity design, discrete choice analysis, and marginal structural models. Examples will be demonstrated with procedures in major statistical software.

Social Epidemiology
Fall of even years. 3(3-0) Interdepartmental with Sociology. Administered by Epidemiology. P: EPI 810 or approval of department RB: (LCS 829 or EPI 812) or equivalent R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. Introduction to the field of social epidemiology and the social determinants of health. Contemporary theoretical and methodological issues in social epidemiology.

Advanced Topics in Infectious Disease Epidemiology
Spring of even years. 3(3-0) RB: EPI 817 R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. Epidemiological and public health perspectives on the etiology, transmission and prevention of infectious diseases. Key conceptual and methodological issues associated with studying infectious diseases from molecular and population based perspectives.

Independent Study
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Open to doctoral students in the Epidemiology major. Approval of department. Special projects, directed reading, and research arranged by an individual graduate student and a faculty member in areas supplementing regular course offerings.