Department of Epidemiology and Biostatistics
College of Human Medicine

200 A Multi-disciplinary Approach to Problems in Global Public Health and Epidemiology
Fall. 3(3-0) R: 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.

240 Epidemiological Investigations in Nutrition and Health
Summer. 3(3-0) Interdepartmental with Human Nutrition and Foods. Administered by Epidemiology. P: HNF 150 or concurrently or approval of department.
Integration of epidemiology with human nutrition concepts to understand the role of dietary intake and nutritional status as determinants of health-related issues in populations.

280 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.

289 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, introductory, planned learning for an individual student in areas supplementing regular course offerings.

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

380 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.

390 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.

465 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

489 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.

490 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.

495 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. Offered first half of semester.

546 Information Management: Fundamentals of Epidemiology and Biostatistics
Spring. 1(1-0) R: 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.

547 Information Management: Applications of Epidemiology and Biostatistics
Fall. 1(1-0) P: EPI 546 R: 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.

805 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 or doctoral students in the Department of Epidemiology and Biostatistics or approval of department.
Historical evolution of models of disease causation and population perspectives on disease.

808 Biostatistics I
Fall. 3(3-0) Interdepartmental with Statistics and Probability. Administered by Biostatistics Major or 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.

808B 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 estimates, methods of constructing test and estimation procedures. Sample size, power, and efficiency.

809 Biostatistics II
Spring. 3(3-0) Interdepartmental with Statistics and Probability. Administered by Biostatistics. 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.

810 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.

812 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.
815 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
Survey of methodologies used in epideimiologic stud-  
ies of cardiovascular diseases. Review of evidence of  
genetic, environmental, and behavioral causes of  
cardiovascular disease.

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 Geog-  
raphy. Administered by Epidemiology. P: EPI 810 or GEO 865 R: Open to graduate stu-  
dents in the Department of Epidemiology and Biostatistics or in the Department of Geogra-  
phy or approval of department. SA: HM 819
Concepts, techniques, and utilization of spatio-epide-  
miologic 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
Basic principles of carcinogenesis. Major etiologic factors, types of malignancies, and biomarkers for susceptibility and exposure. Prevention and early de-  
tection of cancer.

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 quantita-  
tive background. R: Open to graduate stu-  
dents in the Biostatistics Major or in the Epi-  
demiology Major or approval of department. Applications to real data from clinical and epideimiologic studies of categorical outcomes, distributions for  
categorical responses and contingency tables, lo-  
gistic regression and related logit models for binary and multivariate 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 con-  
duct of epidemiology research. Topics include in-  
formed consent, scientific misconduct; human sub-  
jects protection; responsible data management in-  
cluding electronic medical records, biological sam-  
ples 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)
Applied analytical methods in experimental design. Assessment of health and disease status of animal and human populations. Risk assessment and inter-  
pretation of clinical trials.

830 Epidemiologic Overview of Foodborne Diseases and Food Safety  
Fall. 3(3-0) Interdepartmental with Large An-  
imal Clinical Sciences. Administered by Large Animal Clinical Sciences. RB: Ad-  
vanced undergraduate courses in biology, microbiology, biological sciences, biochemi-  
cal sciences, food technology. R: Open to  
graduate students in the College of Veteri-  
ary Medicine or in the Food Safety Special-  
ization or in the Food Safety major. Epidemiologic survey of important foodborne dis-  
eeses addressing recent trends. Sources of surveil-  
ance data. Measurement and management of risk  
factors associated with major foodborne diseases. Tracking foodborne pathogens from farm to table. In-  
troduction to Hazard Analysis Critical Control Points (HACCP).

835 Neuroepidemiology  
Fall of odd years. 3(3-0) Interdepartmental with Neurology and Ophthalmology. Admin-  
istered by Epidemiology. P: EPI 810 or ap-  
proval of department R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. Epidemiology of neurologic and neuropsychiatric dis-  
orders with emphasis on neurodegenerative disor-  
ders (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 gradu-  
ate students in the Department of Epidemiolog-  
y and Biostatistics or approval of depart-  
ment.

840 Clinical Epidemiology for Healthcare Practice  
Fall. 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
Analysis of lifetime data. Estimation of survival func-  
tions for parametric and nonparametric models. Cen-  

851 SAS Programming I: Essentials  
Fall. 1(1-0) P: Open to graduate students in the Department of Epidemiology and Biosta-  
tistics 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 gradu- 
ate students in the Department of Epidemiolog-  
y and Biostatistics or approval of depart- 
ment. A programming approach to plan and write SAS pro- 
grams 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 ap- 
proval of department. Statistical computation and algorithms using program- 
ing 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 gradu- 
ate students in the Department of Epidemiolog- 
y and Biostatistics or approval of depart- 
ment. Introduction to fundamental principles and modeling of genomic /genetic data and computational tech- 
niques.

856 Statistical Consulting in Public Health  
Spring, 1(1-0) P: (EPI 826B or EPI 826) and  
(LCS 829 or concurrently) R: Open to gradu- 
ate students in the Department of Epidemiolog- 
y and Biostatistics or approval of depart- 
ment. Critical appraisal of applied epidemiological studies, use of real applications to solve design and data anal- 
ysis problems, and communication of findings to public health researchers, oral/written reports on intermedi- ate and final results of case studies.

858 Clinical Trials  
Spring of even years. 3(3-0) P: (EPI 808B or EPI 809) or (LCS 829 or concurrently) R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. Statistical methods for design and analysis of clinical trials and epidemiological studies. Phase I, II, and III clinical trials. Principle of Intention-to-Treat, effects of non-compliance, drop-outs, interim monitoring of clinical trials and data safety monitoring boards. Meta-analysis. Crossover designs. Sample size and power in clinical trials. Sequential designs.
860 Advanced Inference for Biostatistics
Fall. 3(3-0) Interdepartmental with Statistics and Probability. Administered by Epidemiology. P: STT 861 and STT 862 or approval of department 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.

889 Applied Epidemiologic Methods for Public Health Practitioners
Fall of odd years. 3(3-0) Interdepartmental with Human Medicine. Administered by Human Medicine. P: HM 802 and HM 803 RB: Academic or professional background in public health and/or public health related discipline R: Open to students in the Public Health major or approval of college.
Identification and conceptualization of public health problems. Generation of testable hypotheses and appropriate data sets. Interpretation of appropriate measures of associations. Evaluation of validity and generalizability of results and ethical issues surrounding the use of humans in epidemiological research. Real case studies are used to analyze study design including the role of chance, bias, misclassification, effect measure modification, interaction, and missing data.

890 Independent Study in Epidemiology
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 such as population genetics.

899 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.

910 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.

920 Advanced Methods in Epidemiology and Applied Statistics
Spring. 3(3-0) Interdepartmental with Statistics and Probability. Administered by Epidemiology. P: (EPI 826 or concurrently) or EPI 826 or approval of department 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.

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

950 Advanced Biostatistical Methods in Epidemiology
Fall of even years. 3(3-0) P: (EPI 826 or concurrently) or EPI 826 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.

952 Duration and Severity Analysis
Spring of odd years. 3(3-0) P: (EPI 826B or concurrently) or EPI 826B RB: 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.

953 Analytical Strategies for Observational Studies
Fall of odd years. 3(3-0) P: (EPI 826 or concurrently) or EPI 826 RB: Calculus, linear and logistic regressions. R: 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.

977 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.

979 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.

990 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.

999 Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 24 credits in all enrollments for this course. R: Open to doctoral students in the Epidemiology major. Doctoral dissertation research.