EPI—Epidemiology

Department of Epidemiology and Biostatistics
College of Human Medicine

Epidemiology Minor or approval of department.

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.

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.

380 Advanced Topics/Medods 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 Minor or approval of department.

Conceptual and analytical methods used in public health and epidemiology.

546 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.

547 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.

801 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.

801B Advanced Biostatistics Fall. 3(3-0) P: EPI 810 or concurrently 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.

808 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.

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


817 Epidemiology of Communicable Diseases Fall. 3(3-0) R: 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.

820 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


825 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

Applications 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 gradu-
ate students in the Biostatistics Major or in
the Epidemiology Major or approval of de-
partment. Applications to real data from clinical and epidemi-
ologic studies of categorical outcomes, distributions
for categorical responses and contingency tables,
logistic regression and related logit models for bi-
nary and multycategory 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.

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 disorders with emphases on neurodegenerative dis-
orders (e.g., Alzheimer's disease).

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

847 Analysis of Survival Data
Spring. 3(3-0) Interdepart-
mental with Statistics and Probability. Ad-
ministered by Statistics and Probability. RB:
STT 422 or STT 442 or STT 862
Analysis of lifetime data. Estimation of survival func-

851 SAS Programming I: Essentials
Fall. 1(1-0) R: Open to graduate students in the Department of Epidemiology and Bio-
statistics 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 Epidemi-
ology and Biostatistics or approval of de-
partment. 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 Biostatis-
tics Major or in the Epidemiology Major or approval of department. Statistical computation and algorithms using pro-
gramming languages, SAS/IML, R and/or Sata, New-
ly developed method, Monte Carlo simulation of probability distributions, bootstrap, statistical graph-
ics.

855 Biostatistical Modeling in Genomic Data Analysis
Fall. 3(3-0) P: (EPI 808B and EPI 826B) and
(EPI 826 or concurrently) R: Open to gradu-
ate students in the Department of Epidemiology and Biostatistics or approval of de-
partment. 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 and EPI 826
and (LCS 829 or concurrently) R: Open to gradu-
ate 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 in-
termediate 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 Epidemiol-
ogy. P: STT 861 and (STT 862 or concur-
rently) or approval of department RB: Mas-
ters in statistics or biostatistics R: Open to doctoral students in the Department of Epi-
demiology and Biostatistics or approval of department. Statistical inference problems with biomedical appli-
ations.

880 Select Topics in Biostatistics
Summer. 3(3-0) A student may earn a max-
imum 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 Epi-
demiology and Biostatistics or approval of department. Select topics in biostatistics including global disease distribution and estimation, causal inference, Bayes-
ian methods in health services research.

889 Applied Epidemiologic Methods for Public Health Practitioners
Fall of even years. 3(3-0) Interdepartmental with Human Medicine. Administered by Hu-
man 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 R: Open to students in public health and/or public health related discipline R: Open to students in the Biostatistics Major or in the Epidemiology Major or approval of department.

890 Independent Study in Epidemiology and Biostatistics
Fall, Spring. 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 Depart-
ment of Epidemiology and Biostatistics. Approval of department. Independent study in areas relevant to epidemiology and biostatistics.

899 Master's Thesis Research
Fall, Spring. 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. R: Open to doctoral students in the Department of Epidemiology and Biostatistics. Approval of department. R: Open to Master of Science in Epidemi-
ology R: Open to doctoral students in the Epidemiology major. Discussion and critique of important contemporary themes in epidemiology as reflected in current publi-
lications in the field.

919 COVID-19 Epidemiology and Public Health
Fall, Spring. 3(3-0) A student may earn a maxi-
mum of 9 credits in all enrollments for this course. RB: Master of Science in Epidemi-
ology R: Open to doctoral students in the Epidemiology major. Application of epidemiologic and public health princi-
ples to COVID-19.
920 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 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 RB: 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 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.

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

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.