EPIDEMIOLOGY

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

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.

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.

456 Health and Healthcare in Sub-Saharan Africa
Summer of odd years. 3(3-0) R: Open to juniors or seniors or graduate students. Survey of health and healthcare in Sub-Saharan Africa. Role and effect of geopolitical influences on public health in the region.

475 Study Abroad in Epidemiology, Biostatistics or Public Health
Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 20 credits in all enrollments for this course. R: Approval of department. Study abroad under MSU faculty supervision in selected countries. Epidemiology, health and behavior, and social topics in relation to cultural sites, social structures, museums, and institutions.

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) R: Not open to freshmen or sophomores or lifelong undergraduate 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 Biostats
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) R: EPI 810 or concurrently R: Open to undergraduate students in the Epidemiology major 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 Epidemiology. RB: College-level algebra. R: Open to masters 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.

80B Advanced Biostatistics
Fall. 3(3-0) P: EPI 810 or concurrently or approval of department RB: Preparation in mathematics and statistics as reflected by previous degree program transcript and a designated score on the quantitative section of the GRE test. R: Open to graduate students in the Department of Epidemiology and Biostatistics. 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 Epidemiology. P: EPI 808 RB: MTH 103 or MTH 110 or MTH 116 R: Open to masters 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 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 Epidemiology major or approval of department. SA: HM 812 Causality in epidemiology. Application of theoretical concepts to the design, analysis, and assessment of epidemiologic research.

813 Investigation of Disease Outbreaks
Spring. 3 credits. P: EPI 810 R: Open to graduate students in the Epidemiology major or approval of department. SA: HM 813 Principles of and practice in investigating disease outbreaks.

814 Nutritional Epidemiology
Spring of even years. 3(3-0) P: EPI 810 and (EPI 808 and EPI 809 or approval of department) RB: LCS 829 SA: HM 814 Methodologies used in epidemiologic studies of diet and health in the context of U.S. and international dietary patterns. Relationship between diet and specific diseases.

815 Epidemiology of Cardiovascular Disease
Spring of even years. 3(3-0) P: EPI 810 R: Open to graduate students in the Department of Epidemiology or approval of department. SA: HM 815 Survey of methodologies used in epidemiologic studies of cardiovascular diseases. Review of evidence of genetic, environmental, and behavioral causes of cardiovascular disease.

816 Perinatal Epidemiology
Fall (3-0) RB: EPI 810 R: Open to graduate students in the Epidemiology major or approval of department. SA: HM 816 Epidemiology of adverse health states in pregnancy and the peripartum. 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 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 435 R: Open to graduate students in the Department of Epidemiology or in the Department of Geography or approval of department. SA: HM 823


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

Concepts, techniques, and utilization of spatio-epidemiologic analyses for human health.

826 Research Methods in Epidemiology
Fall. 3(3-0) P: EPI 809 R: Open to graduate students in the Epidemiology major 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: 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 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 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


830 Epidemiologic Overview of Foodborne Diseases and Food Safety
Fall. 3(3-0) Interdepartmental with Large Animal Clinical Sciences. Administered by Large Animal Clinical Sciences. RB: Advanced undergraduate courses in biology, microbiology, biological sciences, biochemistry, food technology. R: Open to graduate students in the College of Veterinary Medicine or in the Food Safety Specialization or in the Food Safety major. SA: HM 823


831 Global Burden of Disease - Non-Communicable I
Fall. 1(2-0) P: EPI 810 or concurrently R: Open to students in the Epidemiology major or in the Global Public Health and Epidemiology Specialization or in the Health Communication major or approval of department. Cardiovascular disease, diabetes, breast cancer and neurological diseases. Epidemiology and public health aspects of non-communicable diseases. Data sources (State vital records), drug dependence, kidney disease, and psychiatric diseases. Offered first half of semester.

832 Global Burden of Disease - Communicable I
Fall. 1(2-0) P: EPI 810 or concurrently R: Open to students in the Epidemiology major or in the Global Public Health and Epidemiology Specialization or in the Health Communication major or approval of department. Tuberculosis, food-borne illnesses, anti-microbial resistance and avian influenza topics. Epidemiology and public health aspects of these communicable diseases. Outbreak investigations, rabies, SARS, zoonotic diseases and emerging diseases. Offered second half of semester.

833 Global Burden of Disease - Non-Communicable II
Spring. 1(2-0) P: EPI 810 or concurrently R: Open to students in the Epidemiology major or in the Global Public Health and Epidemiology Specialization or in the Health Communication major or approval of department. Asthma, colon cancer, psychiatric diseases and chronic obstructive pulmonary disease-related topics. Data sources (birth defects), drug dependence, psychiatric diseases and kidney disease. Offered first half of semester.

834 Global Burden of Disease - Communicable II
Spring. 1(2-0) P: EPI 810 or concurrently R: Open to students in the Epidemiology major or in the Global Public Health and Epidemiology Specialization or in the Health Communication major. Approval of department. HIV, influenza, West Nile, and vaccine-preventable diseases. Rabies, outbreak investigations, SARS, zoonotic diseases and emerging diseases. Offered second half of semester.

835 Neuroepidemiology
Summer of even years. 3(3-0) Interdepartmental with Neurology and Ophthalmology. Administered by Epidemiology. P: EPI 810 R: Open to graduate students in the Epidemiology major or approval of department. Epidemiology of neurologic conditions and discussion of the inherent difficulty in studying these disorders. Offered first half of semester.

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

851 SAS Programming I: Essentials
Fall. 1(1-0) R: Open to graduate students in the Epidemiology major 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 Epidemiology major 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: 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 R: Approval of department.

Introduction to fundamental principles and modeling of genomic /genetic data and computational techniques.

856 Statistical Consulting in Public Health
Spring. 1(1-0) P: EPI 826B and (LCS 829 or concurrently) R: 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.
Clinical Trials
Spring. 3(3-0) P: EPI 808B or EPI 808 or EPI 809 or LCS 829 R: Approval of department.

Select Topics in Biostatistics
Summer. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. RB: EPI 808 and EPI 809 for graduate students in the Department of Epidemiology and Biostatistics. PHM 830 or STT 464 or equivalent. R: Approval of department. Select topics in biostatistics including global disease distribution and estimation, causal inference, Bayesian methods in health services research.

Applied Epidemiologic Methods for Public Health Practitioners
Fall of even 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.

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 masters students in the Epidemiology major. Approval of department. Independent study in areas relevant to epidemiology such as population genetics.

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 masters students in the Epidemiology major. Approval of department. SA: HM 699 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 of even years. 3(3-0) Interdepartmental with Statistics and Probability. Administered by Epidemiology. P: EPI 826 Pattern recognition and cluster analysis, longitudinal data analysis, path analysis, repeated measures and time-series analysis.