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.

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 (HNF 260 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.

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 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.

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) 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) 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.

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 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 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.

808B  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 and interval estimation, hypothesis testing, maximum likelihood estimation, models 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 epidemicologic 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.

813  Investigation of Disease Outbreaks
Spring. 3 credits. P: EPI 810 R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. SA: HM 813

Principles and of 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 R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. 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) R: EPI 810 R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department. SA: HM 815

Epidemiology—EPI

816 Perinatal Epidemiology Fall. 3(3-0) RB: EPI 810 R: Open to gradu-
ate students in the Department of Epidemi-
ology and Biostatistics or approval of de-
partment. 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 435 R: Open to graduate
students 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-
epidemiologic analyses for human health.

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 Depart-
ment 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
detection 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: Approval of department.
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 bina-
ry 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
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-
ical sciences, food technology. R: Open to graduate students in the College of Veteri-
nary Medicine or in the Food Safety Special-
ization or in the Food Safety major.
Epidemiologic survey of important foodborne dis-
eseases 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.
Introduction to Hazard Analysis Critical Control Points (HACCP).

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 Epidemi-
ology Specialization or in the Health Com-
munication major or approval of department.
Asthma, colon cancer, psychiatric diseases and chronic obstructive pulmonary disease-related top-
ics. 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 Epidemi-
ology Specialization or in the Health Com-
munication major or 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) Interdepart-
mental with Neurology and Ophthalmology. Administered by Epidemiology. P: EPI 810 R: Open to graduate students in the De-
partment of Epidemiology and Biostatistics or approval of department.
Epidemiology of neurologic conditions and discus-
ion of the inherent difficulty in studying these disor-
ders. Offered 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 Spring of odd years. 3(3-0) Interdepart-
mental with Statistics and Probability. Ad-
ministered 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 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 Epidemi-
ology and Biostatistics or approval of de-
partment.
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 pro-
gramming 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 tech-
niques.

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

858 Clinical Trials Spring. 3(3-0) P: EPI 808B or EPI 808 or EPI 809 or LCS 829 R: Approval of depart-
ment.

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. RB: EPI 808 and EPI 809 for gradu-
ate students in the Department of Epidemi-
ology and Biostatistics. PHM 830 or STT 464 or equivalent. R: Approval of depart-
ment.
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 Human Medicine. P: HM 602 and HM 603 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 rounding the use of humans in epidemiological research. Evaluation of validity and appropriate data sets. Interpretation of appropriate problems. Generation of testable hypotheses and identification and conceptualization of public health problems.

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 masters 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 masters students in the Department of Epidemiology and Biostatistics. Approval of department. 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 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.

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 808 or EPI 809 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.