

Department of Epidemiology and Biostatistics

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Epidemiology is a quantitative, data-driven discipline that uses rigorous methods to collect, analyze, and interpret health-related data in human populations. Epidemiologists study the frequency, distribution, and determinants of disease in human populations and use this information to develop disease prevention strategies and improve population health. The faculty in the Department of Epidemiology and Biostatistics, Program in Public Health, at the University of California, Irvine has expertise in epidemiologic design and methods, biostatistics, and bioinformatics. Research in the Department largely focuses on, but is not limited to the interplay of genetic, other molecular, environmental, and nutritional factors on human health and disease, with an emphasis on diseases such as aging, cardiovascular disease, cancers, dementia, diabetes, liver and blood diseases, and obesity. Our active research programs provide our students with many outstanding opportunities to participate actively in cutting-edge research. See the Department website (<https://www.publichealth.uci.edu>) for specifics on the latest projects.

The Department provides rigorous training in the fundamentals and practice of epidemiology and biostatistics, and offers programs of study leading to the M.S. or Ph.D. in Epidemiology. Departmental faculty also provide guidance on curricular and programmatic activities for the M.P.H. in Epidemiology, the M.P.H. in Biostatistics and the B.S. in Public Health Sciences. The Department does offer undergraduate courses. In addition, undergraduates who would like additional experience in epidemiology and biostatistics may arrange to take directed-studies courses with Departmental faculty (EPIDEM 199). These undergraduate courses are primarily designed for upper-division undergraduates irrespective of their major. Diversity and inclusion are core values of the Department and reflects our mission to improve population health through research, education, community engagement and translation of discoveries to practice.

- Epidemiology, M.S.
- Epidemiology, Ph.D.

Courses

EPIDEM 199. Undergraduate Research in Epidemiology. 2-4 Units.

Provides disciplinary research participation. Original or existing research options provide undergraduates the opportunity for faculty/mentor interactions including access to appropriate facilities. Medical Epidemiology research areas: Cancer, Genetic/Molecular, Environmental, Occupational, Biostatistics, and Infectious Disease.

Repeatability: Unlimited as topics vary.

Restriction: Upper-division students only.

EPIDEM 200A. Principles of Epidemiology. 4 Units.

Fundamental principles of epidemiology, biostatistics, and epidemiological research. Topics include research methods of measuring health problems in populations, disease control and prevention in populations, how epidemiology contributes to knowledge of disease etiology, and biostatistical analysis and interpretation of epidemiologic data.

Same as PUBHLTH 206A.

Restriction: Graduate students only.

EPIDEM 200B. Intermediate Epidemiology. 4 Units.

Learn to design and conduct epidemiologic studies using common designs. Determine why bias and measurement error arise in observational studies, and how they influence effect estimates. Perform and interpret epidemiologic data analyses using statistical software.

Prerequisite: PUBHLTH 206A. PUBHLTH 206A with a grade of B or better

Same as PUBHLTH 206B.

Restriction: College of Health Sciences students only. Program in Public Health students only. Master of Public Health Degree students only. Graduate students only. Epidemiology Majors only.

EPIDEM 200C. Advanced Epidemiologic Methods. 4 Units.

Advanced topics in the design and statistical analysis of epidemiologic studies. Topics include simulation methods, counter-matching and multiphase study designs, missing data, and Bayesian analysis. Published simulation studies are discussed and replicated using the R software package.

Prerequisite: EPIDEM 200A and EPIDEM 200B. EPIDEM 200A with a grade of B or better. EPIDEM 200B with a grade of B or better

Same as PUBHLTH 206C.

EPIDEM 201. Cancer Epidemiology. 4 Units.

Concentrates on understanding how epidemiology plays a role in the search for cancer etiology, prevention, control, and treatment; gives an overview of cancer research with an appreciation of the multidisciplinary nature of the field.

Prerequisite: EPIDEM 203 or PUBHLTH 203 or PUBH 206

Restriction: Graduate students only.

EPIDEM 202. Genetic Epidemiology. 4 Units.

Concentrates on the role of genetic factors in the etiology of disease in human populations with an objective of disease control and prevention and the role of interactions of genetic factors and environmental exposures in the occurrence of disease.

Prerequisite: PUBHLTH 203 or EPIDEM 203 or PUBH 206

Restriction: Graduate students only.

EPIDEM 204A. Biostatistics I: Introduction to Statistical Methods. 4 Units.

Designed to help students develop an appreciation for statistician's view of the research process, emphasizing biomedical research. Instills an understanding of how statistical models are used to yield insights about data that form evidence-based understanding of the world around us.

Same as PUBHLTH 204.

Restriction: Graduate students only.

EPIDEM 204B. Biostatistics II: Intermediate Statistical Methods. 4 Units.

Intended for graduate students in epidemiology, public health, and clinical research fields. Covers common regression-modeling techniques frequently used in biologic and medical applications.

Prerequisite: EPIDEM 204. EPIDEM 204 with a grade of B or better

Repeatability: May be taken for credit 2 times.

Same as PUBHLTH 204B.

Restriction: Graduate students only.

EPIDEM 204C. Biostatistics III: Advanced Statistical Methods. 4 Units.

Intended for graduate students in epidemiology, public health, and related fields. Introduces statistical methods for analyzing survival and longitudinal/clustered data, and techniques to resolve missing data.

Prerequisite: EPIDEM 204B. EPIDEM 204B with a grade of B or better

Repeatability: May be taken for credit 2 times.

Same as PUBHLTH 204C.

Restriction: Graduate students only.

EPIDEM 205. Environmental Epidemiology. 4 Units.

Concentrates on epidemiological approaches to the assessment of community environmental hazards; issues involved in environmental exposure estimation; interdisciplinary approaches to environmental epidemiology, including the use of biomarkers of exposures and susceptibility; epidemiological studies within the context of risk assessment.

Prerequisite: EPIDEM 200 and EPIDEM 204

Restriction: Graduate students only.

EPIDEM 212. Methods for Design and Implementation of Epidemiologic Research. 2 Units.

Intended for students in epidemiology, public health, and related fields, and covers topics in subject recruitment, data collection, quality assessment and control, and sample-size estimation.

Corequisite: PUBHLTH 206B

Prerequisite: EPIDEM 200A and EPIDEM 204A. EPIDEM 200A with a grade of B or better. EPIDEM 204A with a grade of B or better

Repeatability: May be taken for credit 2 times.

Restriction: Graduate students only.

EPIDEM 215. Introduction to Statistical Genetics. 4 Units.

Provides students with knowledge of the basic principles, concepts, and methods used in statistical genetic research. Topics include principles of population genetics, and statistical methods for family- and population-based studies.

Prerequisite: Two quarters of upper-division or graduate training in statistical methods.

Same as STATS 257.

EPIDEM 232. Chronic Disease Epidemiology & Prevention. 4 Units.

Epidemiological aspects of chronic human diseases. Topics include methodologies for quantifying aspects of prevalent chronic diseases including risk factors, identification of susceptible groups, societal burdens, promising future research; and the intervention, prevention, and control of diseases in populations.

Restriction: Graduate students only.

EPIDEM 244. Toxic Chemicals in Environment. 4 Units.

Industrial ecology of toxicants and their impacts on environmental quality and human health. Explores theoretical basis of toxicity thresholds and regulatory issues. Uses classic and contemporary research articles to understand the legacy of traditional toxicants, and to identify emerging threats.

Restriction: Graduate students only.

EPIDEM 264. Introduction to Environmental Health Science. 4 Units.

Convergence of agents (chemical, physical, biological, or psychosocial) in environment can emerge as diseases influenced by social, political, and economic factors, allowing them to become rooted in society. How these agents from various spheres come together and impact human health.

Same as EHS 264, PUBHLTH 264.

Restriction: Graduate students only. Environmental Health Sciences Majors only. Epidemiology Majors only. Public Health Majors only. Environ Health Sci and Policy Majors only.

EPIDEM 265. Advanced Environmental Health Science. 4 Units.

Explores the complex relationships among exposure processes and adverse health effects of environmental toxins focusing on specific chemicals, sources, transport media, exposure pathways, and human behaviors. Techniques of environmental sampling for exposure assessment are discussed.

Same as PUBHLTH 265.

Restriction: Graduate students only.

EPIDEM 269. Air Pollution, Climate, and Health. 4 Units.

Emission of air pollutants into the atmosphere, physical and meteorological processes that affect transport, and influence on global warming. Concepts of how and where people are most exposed, and how exposures and health effects differ in developed and developing regions.

Same as EHS 269, PUBHLTH 269.

EPIDEM 270. Human Exposure to Environmental Contaminants. 4 Units.

Introduces founders of conceptual thought that environmental contaminants can impact health. Theory and principles of exposure assessment, the continuum from emissions of a contaminant into the environment to evidence of health effects in a population.

Same as EHS 270, PUBHLTH 270.

EPIDEM 275. Special Topics in Epidemiology. 1-4 Units.

Presents various topics and latest research in the broad field of epidemiology.

Repeatability: Unlimited as topics vary.

Restriction: Graduate students only.

EPIDEM 280. Epidemiology Research Journal Club. 1 Unit.

Research journal club is a group discussion of recent publications in epidemiology and related fields. Students rotate as lead discussants, guided by faculty. All attendees are expected to be familiar with the papers at the start of class.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

EPIDEM 282. Epidemiology Department Seminar. 1 Unit.

A forum for the presentation of recent research to epidemiology students, faculty, and other interested parties. The atmosphere is informal, yet rigorous. Speakers range from graduate students through distinguished visitors from other institutions.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

EPIDEM 290. Introduction to Biostatistics and Epidemiology for Medical Fellows. 4 Units.

Prepares medical fellows and other physicians for rotations in research programs. Understanding of basic biostatistics and study design, and interdependencies between the two. Application of principles in evaluation of medical literature for guidance on patient care and public health policy.

Prerequisite: Medical degree.

EPIDEM 296. M.S. Thesis Research and Writing. 1-12 Units.

Individual research and study necessary for a graduate student to prepare and complete the thesis required for the Master of Science (M.S.) degree.

Prerequisite: Advancement to candidacy.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

EPIDEM 297. PhD Degree Dissertation Research & Writing. 1-12 Units.

Individual research and study necessary for a graduate student to prepare and complete the dissertation required for the Doctor of Philosophy (Ph.D.) degree.

Prerequisite: Advancement to candidacy.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

EPIDEM 298. Directed Study in Epidemiology. 2-4 Units.

Directed study with Epidemiology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

EPIDEM 299. Independent Study in Epidemiology. 2-8 Units.

Independent research with Epidemiology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

EPIDEM 399. University Supervised Teaching. 2-4 Units.

Limited to students with active Teaching Assistant (T.A.) appointments.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.