Department of Public Health Sciences

Chair
• Diane S. Lauderdale
Professors
• Habib Ahsan
• Robert D. Gibbons
• Donald Hedeker
• Benjamin B. Lahey
• Diane S. Lauderdale
• Harold Pollack, School of Social Service Administration
• Ronald A. Thisted

Associate Professors
• Kathleen A. Cagney, Sociology
• Brian Chiu
• James J. Dignam
• Dezheng Huo
• Yuan Ji (part-time)
• R. Tamara Konetzka

Assistant Professors
• Lin Chen
• Rena Conti, Pediatrics
• Michael David, Medicine
• Brandon Pierce
• John Schneider, Medicine
• Fabrice Smieliauskas
• Fan Yang

Emeritus Faculty
• John Christian Bailar

Public Health Sciences (PHS) is the home in the Biological Sciences Division to biostatistics, epidemiology and health services research. These core fields in public health research share a focus on the development and implementation of complex analytic methods to understand the determinants of health, the efficacy of experimental treatments, and the structure of health care at the population level. Bringing together these fields in one department underscores their commonality and enhances opportunities for interdisciplinary research. Faculty members lead local, national, and international studies, and also welcome opportunities to collaborate with faculty across the Biological Sciences Division and the university.
Substantively, our research themes include social and environmental determinants of health, genetics and disease, the economics of health care, and the evaluation and implementation of new technologies in public health and clinical care. In terms of methodological expertise, areas in which our faculty has developed innovative approaches include: risk factor measurement; multilevel, clustered and longitudinal data; clinical trials; administrative health data; social networks; and statistical methods to assess the genetic and molecular basis of disease.

**Program of Study**

Currently, the Department of Public Health Sciences offers a graduate program, the Master of Science in Public Health Sciences for Clinical Professionals, and a Ph.D. program. Current information on graduate programs is available from the department’s website at http://health.bsd.uchicago.edu/.

**The Degree of Doctor of Philosophy**

The Department of Public Health Sciences at the University of Chicago offers a program of study leading to the Ph.D. with emphasis in biostatistics, epidemiology or health services research. This program will prepare individuals for research careers in population-based research in human health and biomedical science. The program is organized around a common quantitative core curriculum designed to prepare students methodologically for more in-depth study in their chosen field and for dissertation research. Beyond the core curriculum, each student will choose a major disciplinary area of concentration, take a sequence of advanced courses in that area, and prepare a dissertation of independent, original, and rigorous research. Opportunities for such concentrated study will be available in the three broad areas of biostatistics, epidemiology and health services research, areas of expertise represented by department faculty.

In addition to the concentration, each student will choose a minor program of study in another area either represented by department faculty or offered elsewhere in the Biological Sciences Division or on campus. Tailored to each individual student, the minor will vary in its degree of specificity from student to student. It may be in one of the broad areas represented by the department, or in a more specialized area. Examples of specialized minors include psychiatric or cancer epidemiology, health economics, economics of aging, clinical trials design, cancer biology, genetic or molecular epidemiology, bioinformatics, or medical decision theory.

**Program Requirements**

Students should expect to complete the program in 5 years by fulfilling the following requirements:

- Complete 18 graduate level courses, including:
  - A core curriculum of up to six courses.
  - A major concentration program approved by the faculty consisting of at least 7 additional courses in a disciplinary domain (such as biostatistics).
• A minor program approved by the faculty consisting of at least 3 additional courses in a second disciplinary area.

Successfully complete a course in scientific integrity and the ethical conduct of research, usually in the first year of study (divisional ethics requirement).

Pass a multi-part preliminary examination demonstrating mastery of the core curriculum and of foundational knowledge in the chosen area of concentration.

Teach two quarters for credit in pre-approved teaching assistant positions in the biological sciences (divisional teaching requirement).

Establish a doctoral dissertation committee, present proposed dissertation research to members of that committee and other interested faculty, and obtain written approval from the committee on the proposed dissertation research.

Prepare and defend a doctoral dissertation of independent, original, and rigorous research in the chosen area of concentration.

Participate in the departmental seminar, in weekly faculty/student workshops, and in research workshops that overlap with the chosen area of concentration.

**REQUIRED COURSES**

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<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>PBHS 30900</td>
<td>Principles of Epidemiology</td>
<td>100</td>
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<tr>
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<tr>
<td>PBHS 35411</td>
<td>The U. S. Health Care System</td>
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**APPLICATION FOR ADMISSION**

Applications should be received by December 1st for entrance into the program in the fall quarter and should consist of a BSD application (including three letters of recommendation), uploaded official transcript(s) from all degree institutions, GRE scores, TOEFL scores (if applicable), CV/detailed relevant work history, and a research statement indicating area of major concentration.

Interested students should visit the department website at http://health.bsd.uchicago.edu.

**MASTER OF SCIENCE IN PUBLIC HEALTH SCIENCES FOR CLINICAL PROFESSIONALS**

The Master of Science Program for Clinical Professionals is a course of study in the theory, methods, and concepts of biostatistics, epidemiology, and health services research needed to design and carry out clinical and epidemiologic research programs. It is designed for the professional enhancement of physicians and other clinical professionals. The program can be completed in one year of full time study, or it can be undertaken in conjunction with a clinical fellowship or training program, in which case the course work may be distributed over two or three years. Students in the program acquire skills with basic statistical methods, followed
by additional training in the fundamental theory and methods of epidemiology, biostatistics, and health services research. Through choice from a broad range of elective courses, students can specialize in one of the three disciplinary areas.

**ENTRANCE REQUIREMENTS**

Applicants should either have a doctoral level clinical degree (such as M.D., D.O., or nursing Ph.D.) from an accredited institution, or must have completed pre-clinical training at an accredited medical school. In the latter case, the candidate must provide a plan for completion of both the M.D. and S.M. degrees, and a letter of support from the candidate’s medical school.

**PROGRAM REQUIREMENTS**

A candidate in this program for the degree of Master of Science in Public Health Sciences must complete the required and elective courses (nine courses in total), and complete a master’s paper.

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<td>OR</td>
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<tr>
<td>PBHS 30900</td>
<td>Principles of Epidemiology</td>
<td>100</td>
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<tr>
<td>PBHS 32100</td>
<td>Introduction to Biostatistics</td>
<td>100</td>
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<td>PBHS 33100</td>
<td>Applied Survival Analysis</td>
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* STAT 22000 or equivalent can be substituted for this course.

**APPLICATION FOR ADMISSION**

Applications for admission should be completed by December 1st for entry into the program in the following summer quarter.

If the degree program will be pursued while the candidate will be participating in a clinical training program, a letter of support from the training program director is required. Candidates must also submit a statement describing how the proposed course of study will enhance their professional objectives. In addition, candidates must provide transcripts from all post secondary institutions, MCAT or GRE scores, and a completed Biological Sciences Division application.

Interested students should visit the department website at http://health.bsd.uchicago.edu .
HEALTH STUDIES COURSES

HSTD 32901. Introduction to Clinical Trials. 100 Units.
Instructor(s): James Dignam
Equivalent Course(s): CCTS 32901

PUBLIC HEALTH SCIENCES COURSES

PBHS 30030. Introduction to Global Health. 100 Units.
This course provides an overview of global health from the historical perspective to the current state of global health. The course features weekly guest lecturers with a broad range of expertise in the field: topics include the social and economic determinants of health, the economics of global health, global burden of disease, and globalization of health risks, as well as the importance of ethics, human rights, and diplomacy in promoting a healthier world. The course is designed for graduate-level students and senior undergraduates with an interest in global health work in resource-limited settings.
Instructor(s): J. Schneider, C. S. Olopade Terms Offered: Winter
Prerequisite(s): This course does not meet requirements for the biological sciences major
Equivalent Course(s): BIOS 29294, CCTS 43000

PBHS 30700. Clinical Epidemiology. 100 Units.
Clinical epidemiology is the "application of epidemiologic principles and methods to problems encountered in clinical medicine." This course introduces the basic principles of epidemiologic study design, analysis and interpretation, with a particular focus on clinical applications. The course includes lectures and discussions based on critical appraisal of significant research articles. The course is primarily intended for, but not restricted to, students with prior clinical training. Public Health Sciences 30700 and 30900 may not both be taken for credit, either will fulfill the basic epidemiology requirement for the MSCP in Public Health Sciences and either will serve as the epidemiology prerequisite for Public Health Sciences 31001.
Instructor(s): B. Chiu, D. Lauderdale Terms Offered: Summer
Prerequisite(s): Introductory statistics recommended, may be taken concurrently.
Equivalent Course(s): CCTS 45100

PBHS 30900. Principles of Epidemiology. 100 Units.
This course does not meet requirements for the biological sciences major. Epidemiology is the study of the distribution and determinants of health and disease in human populations. This course introduces the basic principles of epidemiologic study design, analysis, and interpretation through lectures, assignments, and critical appraisal of both classic and contemporary research articles.
Instructor(s): B. Lahey Terms Offered: Autumn
Prerequisite(s): Introductory statistics recommended or Consent of Instructor
Equivalent Course(s): BIOS 29318, ENST 27400, PPHA 36400, STAT 35000
PBHS 31001. Epidemiologic Methods. 100 Units.
This course expands on the material presented in "Principles of Epidemiology," further exploring issues in the conduct of epidemiologic studies. The student will learn the application of both stratified and multivariate methods to the analysis of epidemiologic data. The final project will be to write the "specific aims" and "methods" sections of a research proposal on a topic of the student's choice.
Instructor(s): B. Chiu Terms Offered: Winter
Prerequisite(s): PBHS 30700 or PBHS 30900 AND PBHS 32400 or applied statistics courses through multivariate regression.
Equivalent Course(s): STAT 35700

PBHS 31200. Cancer Epidemiology. 100 Units.
The purpose of this course is to review the basic concepts and issues relevant to cancer epidemiology. Specifically, this course will focus on interpreting cancer statistics, and describing the current state of knowledge regarding the etiology and risk factors for the major cancer sites. In addition, issues in research design and interpretation within the context of cancer epidemiology, as well as the molecular and cellular basis of carcinogenesis as it pertains to cancer occurrence in populations will be discussed. The course is appropriate for students who have an introductory knowledge of epidemiology. Previous study of cancer biology is helpful but not required.
Instructor(s): B. Chiu Terms Offered: Winter
Prerequisite(s): PBHS 30700 or PBHS 30900
Note(s): Course not offered in 2015-16.

PBHS 31300. Infectious Disease Epidemiology; Networks and Modeling. 100 Units.
No description available.
Instructor(s): M. David, J. Schneider Terms Offered: Spring 2015
Prerequisite(s): PBHS 30700 or PBHS 30900 or introductory epidemiology or consent of instructor.
Equivalent Course(s): BIOS 25419, MEDC 31300, CCTS 31300

PBHS 31400. Social Epidemiology. 100 Units.
This course will examine research that has sought to understand how social factors influence health. We will survey and evaluate different types of measurements used in social epidemiology (such as measurements of socioeconomic status, race, ethnicity, stress, social support and neighborhood characteristics), types of study designs, and debates and theories in the literature. A prior course in epidemiology or closely related filed (such as demography or medical sociology) is highly desirable. Familiarity with the statistical methods used in the literature we will be reading, in particular multivariate regression analysis, is necessary.
Instructor(s): D. Lauderdale Terms Offered: Winter
Prerequisite(s): A course in epidemiology, demography, medical sociology or the equivalent, and familiarity with multivariate statistical methods.
Note(s): Course not offered in 2015-16.
Equivalent Course(s): BIOS 29325
PBHS 31510. Critical Readings in Epidemiology. 100 Units.
Course consists of reading and critiquing important and innovative recent papers in epidemiology. Each week, there will be a different substantive or disease focus for the papers. Research areas covered will be primarily, but not exclusively, in noninfectious diseases. Different faculty will lead the discussion each week and students will prepare and present summary critiques of the articles.
Instructor(s): B. Pierce Terms Offered: Spring
Prerequisite(s): PBHS 30700 or PBHS 30900
Note(s): Course not offered in 2015-16.

PBHS 31831. Genetic & Molecular Epidemiology. 100 Units.
This course is designed for students with strong research interests related to identifying and characterizing the role of genetic and molecular features in human disease. Students will be introduced to the key concepts and methodological issues encountered in epidemiological studies that utilize genetic and molecular data. This course will train students on the theoretical and practical aspects of study design and data generation, and also provide the relevant hands-on training for quality control, management, and analysis of large-scale genomic/molecular data. Students are expected to have taken prior coursework in epidemiology, biostatistics, and genetics.
Instructor(s): B. Pierce Terms Offered: Spring
Prerequisite(s): PBHS 30700 or PBHS 30900 (or introductory epidemiology) AND HGEN 47000 or consent of instructor.

PBHS 32100. Introduction to Biostatistics. 100 Units.
This course will provide an introduction to the basic concepts of statistics as applied to the bio-medical and public health sciences. Emphasis is on the use and interpretation of statistical tools for data analysis. Topics include (i) descriptive statistics; (ii) probability and sampling; (iii) the methods of statistical inference; and (iv) an introduction to linear and logistic regression.
Instructor(s): S. Watson Terms Offered: Summer
Prerequisite(s): 2 quarters of pre-calculus
Note(s): *In addition to the course, there is a statistical computing workshop on Wednesdays from 10-11:30am.
Equivalent Course(s): CCTS 45000
PBHS 32400. Applied Regression Analysis. 100 Units.
This course introduces the methods and applications of fitting and interpreting multiple regression models. The primary emphasis is on the method of least squares and its many varieties. Topics include the examination of residuals, the transformation of data, strategies and criteria for the selection of a regression equation, the use of dummy variables, tests of fit, nonlinear models, biases due to excluded variables and measurement error, and the use and interpretation of computer package regression programs. The techniques discussed are illustrated by many real examples involving data from both the natural and social sciences. Matrix notation is introduced as needed.
Terms Offered: Autumn, Spring
Prerequisite(s): STAT 22000 or 23400 or 24500 or PBHS 32100
Equivalent Course(s): STAT 22400

PBHS 32600. Analysis of Categorical Data. 100 Units.
This course covers statistical methods for the analysis of structured, counted data. Topics may include Poisson, multinomial, and product-multinomial sampling models; chi-square and likelihood ratio tests; log-linear models for cross-classified counted data, including models for data with ordinal categories and log-multiplicative models; logistic regression and logit linear models; and measures of association. Applications in the social and biological sciences are considered, and the interpretation of models and fits, rather than mathematical details of computational procedures, is emphasized.
Terms Offered: Winter
Prerequisite(s): STAT 22000 or 23400 or 24500
Equivalent Course(s): STAT 22600

PBHS 32700. Biostatistical Methods. 100 Units.
This course is designed to provide students with tools for analyzing categorical, count, and time-to-event data frequently encountered in medicine, public health, and related biological and social sciences. This course emphasizes application of the methodology rather than statistical theory (e.g., recognition of the appropriate methods; interpretation and presentation of results). Methods covered include contingency table analysis, Kaplan-Meier survival analysis, Cox proportional-hazards survival analysis, logistic regression, and Poisson regression.
Instructor(s): Fan Yang
Terms Offered: Winter
Prerequisite(s): PBHS 32400, STAT 22400 or STAT 24500 or equivalent or consent of instructor.
Equivalent Course(s): STAT 22700
PBHS 32901. Introduction to Clinical Trials. 100 Units.
This course will review major components of clinical trial conduct, including the formulation of clinical hypotheses and study endpoints, trial design, development of the research protocol, trial progress monitoring, analysis, and the summary and reporting of results. Other aspects of clinical trials to be discussed include ethical and regulatory issues in human subjects research, data quality control, meta-analytic overviews and consensus in treatment strategy resulting from clinical trials, and the broader impact of clinical trials on public health.
Instructor(s): TBD Terms Offered: TBD. Course not offered every year.
Prerequisite(s): PBHS 32100 or STAT 22000; Introductory Statistics or Consent of Instructor
Equivalent Course(s): STAT 35201, CCTS 32901

PBHS 33100. Applied Survival Analysis. 100 Units.
This course will provide an introduction to the principles and methods for the analysis of time-to-event data. This type of data occurs extensively in both observational and experimental biomedical and public health studies, as well as in industrial applications. While some theoretical statistical detail is given (at the level appropriate for a Master’s student in statistics), the primary focus will be on data analysis. Problems will be motivated from an epidemiologic and clinical perspective, concentrating on the analysis of cohort data and time-to-event data from controlled clinical trials.
Instructor(s): TBD Terms Offered: TBD
Prerequisite(s): PBHS 32100 or Stat 22000; introductory statistics or consent of instructor
Note(s): Course not offered every year.
Equivalent Course(s): STAT 35600

PBHS 33200. Statistical Analysis with Missing Data. 100 Units.
This course is intended to introduce basic concepts and provide a guide to conducting missing data analysis using the statistical software R. The course will cover topics including Expectation–Maximization algorithm, weighting methods, imputation and other likelihood-based approaches to the analysis of missing data. Some other relevant topics will also be introduced, such as non-ignorable missing data, machine learning methods and multivariate missing data analysis. Computation and application will be emphasized, rather than statistical theory. In the end of the course, the students are expected to complete a final project related to missing data analysis.
Instructor(s): Lin Chen Terms Offered: Winter
Prerequisite(s): PBHS 32400/STAT 22400; or STAT 24500; or equivalent; and basic programming skill using R or equivalent
Note(s): Course offered every other year.
PBHS 33300. Applied Longitudinal Data Analysis. 100 Units.
Longitudinal data consist of multiple measures over time on a sample of individuals. This type of data occurs extensively in both observational and experimental biomedical and public health studies, as well as in studies in sociology and applied economics. This course will provide an introduction to the principles and methods for the analysis of longitudinal data. Whereas some supporting statistical theory will be given, emphasis will be on data analysis and interpretation of models for longitudinal data. Problems will be motivated by applications in epidemiology, clinical medicine, health services research, and disease natural history studies.
Instructor(s): D. Hedeker Terms Offered: Autumn
Prerequisite(s): PBHS 32400/STAT 22400 or equivalent, and PBHS 32600/STAT 22600 or PBHS 32700/STAT 22700 or equivalent; or consent of instructor.
Equivalent Course(s): STAT 36900

PBHS 33400. Multilevel Modeling. 100 Units.
This course will focus on the analysis of multilevel data in which subjects are nested within clusters (e.g., health care providers, hospitals). The focus will be on clustered data, and several extensions to the basic two-level multilevel model will be considered including three-level, cross-classified, multiple membership, and multivariate models. In addition to models for continuous outcomes, methods for non-normal outcomes will be covered, including multilevel models for dichotomous, ordinal, nominal, time-to-event, and count outcomes. Some statistical theory will be given, but the focus will be on application and interpretation of the statistical analyses.
Instructor(s): Donald Hedeker Terms Offered: Spring
Prerequisite(s): PBHS 32400 and PBHS 32700 or consent of instructor.

PBHS 33500. Statistical Applications. 100 Units.
This course provides a transition between statistical theory and practice. The course will cover statistical applications in medicine, mental health, environmental science, analytical chemistry, and public policy.
Lectures are oriented around specific examples from a variety of content areas. Opportunities for the class to work on interesting applied problems presented by U of C faculty will be provided. Although an overview of relevant statistical theory will be presented, emphasis is on the development of statistical solutions to interesting applied problems.
Instructor(s): R. Gibbons Terms Offered: Spring
Prerequisite(s): PBHS 32700/STAT 22700 or STAT 34700 or consent of instructor.
Equivalent Course(s): STAT 35800
PBHS 35000. Fundamentals of Health Services Research: Theory, Methods, and Applications. 100 Units.
This course is designed to provide an introduction to the fundamentals of health services research. The basic concepts of health services research will be taught with emphasis on both their social scientific foundations and the methods needed for their practical application to empirically relevant research. Theoretical foundations will draw on principles from economics, sociology, psychology, and the other social sciences. Methodological topics to be covered will include techniques for data collection and analysis, including outcomes measurement, survey methods, large data set research, population-based study design, community-based participatory research, research based in clinical settings, qualitative methods, cost-effectiveness analysis, and tools of economic and sociological analysis. The theoretical and empirical techniques taught will emphasize those relevant to the examination of health care costs, quality, and access. Major applications will include: measurement and improvement of health care quality, analysis of health disparities, analysis of health care technology, and analysis of health care systems and markets. This course will meet for 1.5-hour sessions, five times per week for six weeks.
Equivalent Course(s): PPHA 47900

PBHS 35100. Health Services Research Methods. 100 Units.
The purpose of this course is to better acquaint students with the methodological issues of research design and data analysis widely used in empirical health services research. To deal with these methods, the course will use a combination of readings, lectures, problem sets (using STATA), and discussion of applications. The course assumes that students have had a prior course in statistics, including the use of linear regression methods.
Instructor(s): T. Konetzka Terms Offered: Spring
Prerequisite(s): At least one course in linear regression and basic familiarity with STATA; or consent of instructor.
Equivalent Course(s): PPHA 38010, SSAD 46300

PBHS 35411. The U. S. Health Care System. 100 Units.
This course is a comprehensive examination of many of the key components of the U.S. health care system and how they work, intended for students from a wide range of backgrounds. Among others, topics may include public and private health insurance, the uninsured, health reform, hospitals, physicians, health care quality and costs, health information technology, pharmaceuticals, medical devices and diagnostics, long-term care, mental health services, and comparisons with health systems in developed and emerging markets
Instructor(s): F. Snieliauskas Terms Offered: Winter & Spring
Note(s): Open to Non-GPHAP students in Winter quarter; GPHAP student requirement in Spring quarter.
Equivalent Course(s): PPHA 37510, SSAD 47512
PBHS 38100. Economics of Health Care. 100 Units.
Theory and evidence on the economics of US medical care. Particular focus on the causes and consequences of high and rising health expenditures; technological change and the specific role of institutions in current reform efforts. The course is targeted to MA and PhD level students in business, policy and related disciplines. The course format will be a mix of lectures and presentations by guest speakers. Grading will be based on class participation, performance on course assignments and a final project. Attendance in all seminars is required.
Instructor(s): R. Conti Terms Offered: Autumn

PBHS 38400. Advanced Topics in Health Economics. 100 Units.
The purpose of this course is to provide substantial exposure to the state of the evidence and the major theoretical and empirical approaches used to study salient issues in health economics. Selected topics may vary from year to year; examples include health capital, health insurance, health behaviors, health care market structure and competition, not-for-profit ownership, payment incentives, and the effects of information on provider behavior (e.g. public reporting and value-based purchasing) and consumer behavior (e.g., advertising and medical decision making)
Instructor(s): T. Konetzka, R. Conti Terms Offered: Autumn
Prerequisite(s): Graduate courses in microeconomics and econometrics or statistics, including the use of linear and nonlinear regression methods.

PBHS 40500. Advanced Epidemiologic Methods. 100 Units.
This course examines some features of study design, but is primarily focused on analytic issues encountered in epidemiologic research. The objective of this course is to enable students to conduct thoughtful analysis of epidemiologic and other population research data. Concepts and methods that will be covered include: matching, sampling, conditional logistic regression, survival analysis, ordinal and polytomous logistic regressions, multiple imputation, and screening and diagnostic test evaluation. The course follows in sequence the material presented in “Epidemiologic Methods.”
Instructor(s): D. Huo Terms Offered: Spring
Prerequisite(s): PBHS 31001
Note(s): Course not offered every year.

PBHS 43010. Applied Bayesian Modeling and Inference. 100 Units.
Course begins with basic probability and distribution theory, and covers a wide range of topics related to Bayesian modeling, computation, and inference. Significant amount of effort will be directed to teaching students on how to build and apply hierarchical models and perform posterior inference. The first half of the course will be focused on basic theory, modeling, and computation using Markov chain Monte Carlo methods, and the second half of the course will be about advanced models and applications. Computation and application will be emphasized so that students will be able to solve real-world problems with Bayesian techniques.
Instructor(s): Y. Ji Terms Offered: Autumn
Prerequisite(s): STAT 24400 and STAT 24500 or master level training in statistics.
Note(s): Course not offered in 2015-16.
PBHS 43201. Introduction to Causal Inference. 100 Units.
This course is designed for graduate students and advanced undergraduate students from the social sciences, education, public health science, public policy, social service administration, and statistics who are involved in quantitative research and are interested in studying causality. The goal of this course is to equip students with basic knowledge of and analytic skills in causal inference. Topics for the course will include the potential outcomes framework for causal inference; experimental and observational studies; identification assumptions for causal parameters; potential pitfalls of using ANCOVA to estimate a causal effect; propensity score based methods including matching, stratification, inverse-probability-of-treatment-weighting (IPTW), marginal mean weighting through stratification (MMWS), and doubly robust estimation; the instrumental variable (IV) method; regression discontinuity design (RDD) including sharp RDD and fuzzy RDD; difference in difference (DID) and generalized DID methods for cross-section and panel data, and fixed effects model. Intermediate Statistics or equivalent is a prerequisite. This course is a pre-requisite for “Advanced Topics in Causal Inference” and “Mediation, moderation, and spillover effects.”

Instructor(s): G. Hong
Terms Offered: Winter
Prerequisite(s): Intermediate Statistics
Note(s): Graduate course open to advanced undergraduates. CHDV Distribution, M*, M*
Equivalent Course(s): STAT 31900, SOCI 30315, PLSC 30102, CHDV 30102