

UCLA FIELDING SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF BIostatISTICS

**STUDENT HANDBOOK
2018-2019**

<http://www.biostat.ucla.edu/>

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1. INTRODUCTION

Welcome to the UCLA Department of Biostatistics!

Biostatistics is the field encompassing the methodology and theory of statistics as applied to problems in the life and health sciences. Biostatisticians are trained in the application of statistical methods to address problems in public health and medicine. Biostatisticians collaborate with scientists in nearly every area related to health.

The Department of Biostatistics offers M.S., M.P.H. Ph.D. and Dr.P.H. degrees.

A degree in biostatistics prepares students for work in a wide variety of challenging positions in government, industry, and academics. UCLA graduates have found excellent careers in diverse settings including universities, the pharmaceutical industry, the biotechnology industry, health care settings, statistical consulting, and federal and local governments. Students have opportunities to participate with faculty in collaborative research projects in wide ranging areas such as cancer, AIDS, gerontology, genetics, immunology, dentistry, medical imaging, mental health, health policy, and clinical research.

The field of biostatistics has undergone tremendous growth in recent years. Biostatistical input is now considered critical in addressing the world's health problems. UCLA has a superior record in training students both at the masters and doctoral levels. A UCLA biostatistics degree provides students with a balanced education that blends theory and practice.

2. ABOUT THE DEPARTMENT

HISTORY AND MISSION

Welcome to the Biostatistics Department at UCLA. The UCLA Division of Biostatistics was established in 1959 in the then new School of Public Health. Among other degree programs, the division offered the Ph.D. in Biostatistics, with the first degree being awarded in 1963. The Department of Biostatistics was established in 1989 when the School of Public Health reorganized into five departments from a single school-wide departmental structure. The Department of Biostatistics was organized to carry out these goals:

- To develop a first-rate graduate program in biostatistics filling a demonstrated need for well-trained biostatisticians.
- To develop Biostatistical research programs responsive to the scientific problems encountered in public health and biomedicine.
- To actively collaborate with investigators at UCLA and worldwide in the solution of health problems.

The Department today is a leader in the training of biostatisticians for universities, government and industry. The Department's research programs are highly respected nationally and internationally. Faculty members collaborate with investigators in an extremely large number of diverse disciplines.

ADMINISTRATION

Dept. Chair: Sudipto Banerjee, Ph.D.
sudipto@ucla.edu
Office 51-254A CHS

Vice Chair: Thomas R. Belin, Ph.D.
tbeling@ucla.edu
Office 51-269 CHS

Dept. Administrator: Ivonne Nelson
inelson@ph.ucla.edu
Office 51-254A CHS, (310) 825-5370

Student Affairs: Roxy Naranjo
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biostat@ucla.edu
(310) 825-5250
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Department Hours: Monday – Friday: 8:00 - 4:00 PM

BIostatistics Faculty

Abdelmonem A. Afifi, Ph.D., Berkeley.

Dean Emeritus and Professor Emeritus, on recall

Joint appointment with Biomathematics

Email: afifi@ucla.edu

Areas of Interest: Multivariate analysis, clinical trials, multi-level models and public health.

Office #: 51-239C CHS

Phone #: (310) 825-0707

Fax #: (310) 267-2113

Hilary Aralis, Ph.D., UCLA.

Adjunct Assistant Professor

Email: haralis@mednet.ucla.edu

Office #: CHS A8-159A

Phone #: 310-794-0119

Fax #: 310-794-6159

Research Interests: Inference for multi-state models with incompletely observed data, uncertainty in Markov and semi-Markov process estimation, latent variable modeling, measurement error in mental health assessment.

Sudipto Banerjee, Ph.D., University of Connecticut, Storrs.

Department Chair and Professor

Email: sudipto@ucla.edu

Office #: 51-254b CHS

Phone #: (310) 825-5916

Fax #: (310) 267-2113

Areas of Interest: Statistical modeling and analysis of geographically referenced datasets, Bayesian statistics (theory and methods) and hierarchical modelling, statistical computing and related software development.

Thomas R. Belin, Ph.D., Harvard.

Professor

Joint appointment with Psychiatry/Biobehavioral Sci.

Email: tbelin@ucla.edu

Areas of Interest: Missing Data, causal inference, record linkage, mental health research.

Office #: 51-267 CHS

Phone #: (310) 206-7361

Fax #: (310) 206-7361

Ronald Brookmeyer, Ph.D., University of Wisconsin

Professor

Email: rbrookmeyer@ucla.edu

Office #: 51-253B CHS

Phone #: (310) 825-2187

Fax #: (310) 267-2113

Areas of Interest: Survival analysis, epidemic models, epidemiological methods, clinical trials, AIDS/HIV, and Alzheimer's disease.

William G. Cumberland, Ph.D., Johns Hopkins.

Professor Emeritus

Director, Biostatistics Core of CFAR

Email: wgc@ucla.edu

Areas of Interest: Finite population sampling, stochastic modeling, applications to cancer, AIDS, and California Health Interview Survey.

Office #: 51-236B CHS

Phone #: (310) 206-9621

Fax #: (310) 267-2113

Dorota M. Dabrowska, Ph.D., Berkeley.

Professor

Joint appointment with Statistics

Office #: 51-253C CHS

Phone #: (310) 206-9624

Email: dorota@ucla.edu

Fax #: (310) 267-2113

Areas of Interest: Inference in nonparametric and semiparametric models, survival analysis, counting processes, data transformations.

Catherine M. Crespi, Ph.D., UCLA.

Associate Professor

Office #: A2-125 CHS

Affiliation: Jonsson Comprehensive Cancer Center,
Division of Cancer Prevention and Control Research

Phone #: (310) 206-9364

Fax #: (310) 267-2113

Email: ccespi@ucla.edu

Areas of Interest: Analysis of recurrent events data, group randomized trials, hidden Markov Models, and Bayesian Methods.

David A. Elashoff, Ph.D., Stanford.

Professor

Office #: 21-254C CHS

Joint appointment with Medicine

Phone #: (310) 794-7835

Email: dae@ucla.edu

Fax #: (310) 267-2113

Areas of Interest: Analysis of DNA microarray data: statistical methods for computing appropriate metrics for gene expression and gene filtering algorithms to isolate differentially expressed genes, analysis of protein mass-spectrometry data, clinical research in nursing and cancer.

Robert M. Elashoff, Ph.D., Harvard.

Professor

Office #: AV-327 CHS

Joint appointment with Biomathematics

Phone #: (310) 825-9421

Areas of Interest: Survival analysis, Cancer, repeated measures analysis, clinical trials design and analysis.

David W. Gjertson, Ph.D., UCLA.

Professor

Office #: 15-30 Rehab Bldg

Joint appointment with Pathology

1000 Veteran Ave

Email: gjertson@ucla.edu

Phone #: (310) 206-0255

Fax #: (310) 825-7651

Areas of Interest: Statistical consulting, genetics, measurement error models.

Steve Horvath, Ph.D., North Carolina & D.Sc., Harvard.

Professor

Office #: 4357A Gonda

Joint appointment with Human Genetics

Phone #: (310) 825-9299

Email: shorvath@mednet.ucla.edu

Fax #: (310) 794-5446

Areas of Interest: Statistical genetics and bioinformatics.

Grace Kim, Ph.D., UCLA

Assistant Professor

Joint appointment with Radiological Science

Office #: 924 Westwood Blvd.

Email: gracekim@mednet.ucla.edu

Phone #: (310) 794-8679

Fax #: (310) 794-8657

Areas of Interest: Classification, analysis in spatially and temporally correlated data, and pattern recognition of therapeutic response in medical imaging data.

Christina Ramirez, Ph.D., Cal Tech.

Professor

Email: cr@ucla.edu

Office #: 21-257 CHS

Phone #: (310) 825-7332

Fax #: (310) 267-2113

Areas of Interest: Statistical genetics, Bayesian phylogeny, nonparametric and semi-parametric methods.

Martin L. Lee, Ph.D., UCLA.

Professor

Email: martin.l.lee@att.net

Office #: 51-236A CHS

Phone #: (310) 781-3627

Area of Interest: Robust statistical methods in Pharmacokinetics.

Gang Li, Ph.D., Florida State.

Professor

Email: vli@ucla.edu

Office #: 51-253B CHS

Phone #: (310) 206-5865

Fax #: (310) 267-2113

Areas of Interest: Survival analysis, analysis of receiver operating characteristic curves, nonparametric and semiparametric inference, longitudinal data analysis, statistical methods in medical imaging, ophthalmology, clinical trials, pharmaceutical statistics, and cancer.

Honghu Liu, Ph.D., UCLA

Professor

Joint Appointment with Dentistry

Email: hhliu@mednet.ucla.edu

Office #: 63-037A CHS

Phone #: (310) 794-0700

Fax #: (310) 206-2688

Area of Interest: AIDS, compliance, Application to Dental Health.

James W. Sayre, Dr.P.H., UCLA.

Professor

Joint appointment with Radiological Sciences

Email: jsayre@ucla.edu

Office #: 51-253A CHS & B3-116

Phone #: (310) 825-3218

Fax #: (310) 267-2113

Areas of Interest: Computational statistics and database management, clinical trials, statistical methodology in medical diagnostic systems.

Damla Senturk, Ph.D., UC Davis.

Associate Professor

Email: dsenturk@ucla.edu

Office #: 21-254C CHS

Phone #: (310) 206-5977

Fax #: (310) 825-6402

Areas of Interest: Regression model building for repeated measures/ longitudinal data, functional data analysis and semiparametric covariate and error adjustments in regression and correlation models with applications to biomedical data.

Janet Sinsheimer, Ph.D., UCLA.

Professor
CHS

Office #: 5357C Gonda & AV-321

Joint appointment with Human Genetics & Biomathematics

Phone #: (310) 825-8002

Email: janet@mednet.ucla.edu

Fax #: (310) 825-8685

Area of Interest: Mathematical and statistical models for determining evolutionary relationships, gene mapping, and sequence variation.

Marc A. Suchard, Ph.D., UCLA.

Professor

Office #: AV-633 CHS/6-558 Gonda

Joint appointment with Human Genetics & Biomathematics
/ 7442

Phone #: (310)-825-0936

Email: msuchard@ucla.edu

Fax #: (310) 825-8685

Area of Interest: Stochastic Processes, Applied Probability, Phylogeny, Longitudinal Modeling.

Catherine Ann Sugar, Ph.D., Stanford.

Associate Professor

Office #: 51-236C CHS

Joint appointment with Psychiatry/Biobehavioral Sci.

Phone #: (310) 794-1078

Email: csugar@ucla.edu

Fax #: (310) 267-2113

Areas of Interest: Clustering, functional data analysis, classification and patterns of covariation in data, applications to HIV/AIDS, mental health, dentistry, nephrology, and particularly health services research.

Donatello Telesca, Ph.D., University of Washington

Assistant Professor

Office #: 21-254 CHS

Email: dtelesca@ucla.edu

Phone #: (310) 825-6402

Fax #: (310) 267-2113

Areas of Interest: Bayesian Inference, Bayesian Model Determination, Bioinformatics, Convolution Models, Cancer Research Decision Theory, Dependent Data, Functional Data Analysis, Markov Chain Monte Carlo Methods, Non-parametric Models.

Robert E. Weiss, Ph.D., Minnesota.

Professor

Office #: 51-269 CHS

Email: robweiss@ucla.edu

Phone #: (310) 206-9626

Fax #: (310) 267-2113

Areas of Interest: Bayesian methods and computation, longitudinal data, diagnostics, graphics, hierarchical models, model selection and specification, applications to AIDS/HIV, bioinformatics, evolution and phylogeny, criminal justice, pediatric pain, community intervention studies.

Weng Kee Wong, Ph.D., Minnesota.

Professor

Email: wkwong@ucla.edu

Office #: 51-239B CHS

Phone #: (310) 206-9622

Fax #: (310) 267-2113

Areas of Interest: Optimal design of experiments, linear models, pharmacokinetics, clinical trials, research in rheumatology, cancer control and prevention studies.

Hua Zhou, Ph.D., Stanford.

Associate Professor

Email: huazhou@ucla.edu

Office #: 21-254A CHS

Phone #: (310)794-7835

Areas of Interest: Statistical computing, numerical optimization, statistical genetics, medical imaging, applied probability, stochastic modeling of HIV and cancer stem cell dynamics.

EMERITI FACULTY

Abdelmonem A. Afifi, Ph.D., Berkeley.

Dean Emeritus and Professor Emeritus

Nancy Berman, Ph.D., American University.

Professor Emerita

Potter Chang, Ph.D., Minnesota.

Professor Emeritus

Virginia A. Clark, Ph.D., UCLA.

Professor Emerita

Frederick J. Dorey, Ph.D., Massachusetts.

Professor Emeritus

Donald Guthrie, Ph.D., Stanford.

Professor Emeritus

Joint appointment with Psychiatry and Biobehavioral Science

Areas of Interest: Applications in mental retardation and child psychiatry, statistical computing.

Robert I. Jennrich, Ph.D., UCLA.

Professor Emeritus

Area of Interest: Statistical computing.

3. THE MASTER OF SCIENCE IN BIOSTATISTICS (M.S.)

PREPARATION FOR THE DEGREE:

Mathematics preparation for the program should include at least two years of calculus. The prior coursework should cover material similar to that contained in the following UCLA courses:

- Mathematics 31A, B Calculus and Analytic Geometry
- Mathematics 32A, B Calculus of Several Variables
- Mathematics 33A, B Matrices, Differential Equations, Infinite Series
- Mathematics 115A Linear Algebra

REQUIREMENTS FOR THE DEGREE:

1. COURSE REQUIREMENTS:

- Biostatistics 200 A, B,C Methods in Biostatistics
 - Biostatistics 202 A, B Theoretical Principles of Biostatistics
 - Biostatistics 244 Master's Seminar and Research Resources for Graduating MS Biostatistics Students
 - Biostatistics 402A Principles of Biostatistical consulting (2 units)
 - Biostatistics 402B Biostatistical Consulting
 - Biostatistics 596 Directed Individual Study or Research for Masters Report (4 units)
-
- One 4 unit course in the Department of Epidemiology (either Epi100 or 200A)
 - One 4 unit course addressing broad public health themes (PH 150 or HPM M242)
 - A minimum of 24 units of electives in the Department of Biostatistics. The elective courses may be chosen from courses in the 200 series with course numbers of 203 and above and no more than one course from the 400 series (see page 43). Students may also apply for permission to use other courses such as from the UCLA Department of Statistics as electives by requesting permission via a blue petition (see page 40) in advance of taking the course (see page 46 for possible courses in the Department of Statistics).

All required courses (except 402B) must be taken for a letter grade.

2. MASTER'S REPORT:

A written report under the direction of a member of the Biostatistics faculty is required. In the spring of the second year of study, students take both Biostatistics 596 under the direction of a faculty member and Biostatistics 244 to guide the report preparation. Students should begin thinking about topics for their report in the beginning of their second year of study. The report must be handed in and approved before the end of the spring term of the second year of study in order to graduate at the end of the second year. The specific deadline dates can be obtained from the Biostatistics Student Affairs Officer (see

page 36). Examples of Masters Reports from recent graduates are available for inspection in the Biostatistics library

3. THE COMPREHENSIVE EXAMINATION:

This is a written comprehensive exam taken at the beginning of the second year of study in September. The scope of the exam includes material covered in the following biostatistics courses: 200A, 200B, 200C, 202A, and 202B. Students must pass the exam to receive the M.S. degree. Students have a maximum of 2 opportunities to pass the exam.

ADVISING NOTE:

All students are assigned an academic advisor who is a faculty member of the Department of Biostatistics. Students should meet with their advisor prior to the beginning of each quarter to discuss course selections. Some students who have add adequate prior background may in consultation of their academic advisor be waived of some core requirements (e.g.: some quarters of the 200 or 202 series); However, the material from those courses would still be included in the required MS comprehensive exam.

A typical course load is 12 units per term for first year students. It's recommend that you discuss with your academic advisor if you are considering taking a heavier course load.

EXAMPLE OF AN M.S. PROGRAM SEQUENCE OF CLASSES

This sequence of classes is intended to serve only as an example of a two-year MS Program in Biostatistics. Student should meet with their faculty advisors to select electives which best suits their interests and goals.

	Fall	Winter	Spring
Year 1	Biostatistics 200A Biostatistics 202A Biostatistics 203A and/or Public Health 150	Biostatistics 200B Biostatistics 202B Biostatistics 203B and/or Epidemiology 100	Biostat 200C Biostatistics elective Biostatistics 402A
- MS Comprehensive Exam – Given at the beginning of fall term of Year 2 Scope of exam: 200A, B, C, 202A, B (see page 11)			
Year 2	Biostatistics elective Biostatistics elective or Public Health 150 Biostatistics 402B*	Biostatistics elective Biostatistics elective or Epidemiology 100 Biostatistics elective	Biostatistics 244 Biostatistics elective Biostatistics 596
* Biostat 402B is taken once during the second year (the quarter is determined at the beginning of fall term). Courses that count toward the Biostat elective requirement are: courses in the 200 series with course numbers of 203 and above and no more than one course from the 400 series (see page 43).			

A typical course load consists of 12 units. It's recommended that you consult with your academic advisor if you are considering taking a heavier course load.

M.S. PROGRAM IN BIostatISTICS: COMPETENCIES

Upon graduation, a student with an MS degree in Biostatistics should have acquired the following competencies

A: Develop skills to serve as an effective biostatistician on a collaborative team of scientists working on public health problems.

- A1 Collaborate with researchers to formulate the aims of a public health research project.
- A2 Formulate a public health question in statistical terms.
- A3 Identify the strengths and weaknesses of different study designs to address public health and scientific questions; communicate these issues to public health researchers
- A4 Assist in the development of data collection tools; evaluate these tools from a statistical vantage point.
- A5 Identify and implement steps necessary to insure the quality of data collected in a study.
- A6 Conduct appropriate statistical analyses of study data and interpret the results.
- A7 Effectively communicate the assumptions and results of analyses through oral and written communications to the collaborative team.
- A8 Use statistical software to answer research questions and communicate the results to other research professionals.

B: Effectively communicate biostatistical concepts, methods and analyses to scientists, public health professionals, students and other biostatisticians.

- B1 Gauge the statistical skill set of an audience to appropriately customize the level of biostatistical presentations.
- B2 Effectively communicate statistical concepts and reasoning to public health collaborators.
- B3 Learn to write and disseminate substantive field publications and communicate the statistical portion of the methodology to a substantive field audience.
- B4 Learn digital tools useful for communication.
- B5 Be able to articulate interdisciplinary approaches to solving public health problems.

C: Develop skills to enable life-long learning in biostatistics applied to public health.

- C1 Develop ability to critically read literature on contemporary public health problems and to identify the salient statistical issues.
- C2 Develop ability to comprehend and be engaged in seminars and presentations on biostatistical research.
- C3 Develop ability to comprehend seminars and presentations in public health sciences and to distill the critical and salient statistical issues.
- C4 Develop ability to use new and evolving computational and digital technologies into Biostatistical work.

4. THE MASTER OF PUBLIC HEALTH IN BIOSTATISTICS (M.P.H.)

PREPARATION FOR THE DEGREE:

Mathematics preparation for the program should include at least one year of calculus:

- Mathematics 31A, B Calculus and Analytic Geometry
- Mathematics 32A Calculus of Several Variables

REQUIREMENTS FOR THE DEGREE:

1. CORE COURSE REQUIREMENTS IN PUBLIC HEALTH (16 UNITS):

- Com Health Sci 100
- Environmental Health 100 or 101
- Epidemiology 100
- Health Policy & Management 100

Core courses may be waived if the student has taken a similar college-level course elsewhere and can pass the waiver examination. For the most updated information on waivers, refer to the public health orientation packet and contact the respective departments.

2. COURSE REQUIREMENTS IN BIOSTATISTICS:

MPH students are required to take 3 core biostatistics methods courses in year 1. Typically MPH students in biostatistics meet this requirement by completing Biostatistics 100A, 100B, and 406.

On occasion MPH students in biostatistics may take Biostatistics 200 A, B and C to meet the core biostatistics methods requirement. However, students may take Biostatistics 200B in place of Biostatistics 100B only if they have previously taken Biostatistics 200A. Students may take Biostatistics 200C in place of 406 only if they have taken 200B. The difference between the biostatistics methods sequences (100A, 100B, 406 vs. 200A, 200B, 200C) is that the 200 sequence has more technical and mathematical detail while the 100/406 sequence focuses on more practical applications. The 200 sequence is taken by MS students in the Department of Biostatistics while the 100/406 sequence is often taken by MPH students in other departments in the School of Public Health. The decision of whether the Biostatistics 200 sequence is an appropriate fit should be made in consultation with the student's advisor, career goals and prior mathematical background. In order to register for the Biostatistics 200 sequence students will need a PTE ("permission to enroll) number and to obtain the PTE number students should contact Roxy Naranjo and the 200 course instructor.

In addition to the 3 methods courses above, students are required to take:

- Biostatistics 201A Topics in Applied Regression
- Biostatistics 201B Topics in Applied Regression

- Biostatistics 203A Computer Management of Health Data
 - Biostatistics 400 Field Studies (4 units)
 - Biostatistics 402A Principles of Biostatistical consulting (2 units)
 - Biostatistics 595 Effective Integration of Biostatistical Concepts in
Public Health Research
- and 12 units of biostatistics elective courses chosen from courses in the 200 series with course numbers of 203B and above or from the 400 series. [Note: carefully check course prerequisites to insure eligibility for the courses and consult with advisor, see page 43].

Required courses toward the degree must be taken for a letter grade.

3. FIELD TRAINING

The field training in an approved public health program of at least ten weeks to provide students a practical experience or internship applying biostatistics. Students sign up for 4 units of Biostatistics 400 in the fall of their second year. Often the field experience is completed during the summer following the first year of graduate study. Students should begin identifying a suitable field training experience in the middle of their first year. Prof. Kate Crespi can help identify field training opportunities for MPH students and approve internships. In addition Roxy Naranjo will send any internship opportunities that she can to you via email.

Examples of sites where recent graduates have had field experiences include the Los Angeles County of Public Health, Boston Scientific Corporation and Cedars Sinai Medical Center. Student must submit the Report on Field Studies for the M.P.H. in Biostatistics form to Roxy Naranjo during the fall term of the second year, or upon completing of the internship.

4. THE MPH CULMINATING EXPERIENCE

The MPH culminating experience has written and oral components:

MPH Culminating Written Report. The MPH written culminating report should demonstrate the application of the material in the curriculum to a public health problem. The report is typically motivated by the Field Training experience. The report needs to be approved by the faculty supervising the report. Examples of reports from recent graduates are available in the Biostatistics Library.

Oral Presentation of MPH Culminating Report: During the oral examination the student presents his/her work to a faculty committee (minimum of 3 members of the biostatistics faculty including the project advisor) and answers questions .Students should submit the Culminating Experience for the M.P.H. in Biostatistics form to Roxy Naranjo at least 1-2 weeks prior to scheduling the Oral presentation. The student must receive a pass from the faculty committee.

EXAMPLE OF MPH PROGRAM IN BIOSTATISTICS SEQUENCE OF CLASSES

This sequence of classes is intended to serve as an example of a two-year MPH Program in Biostatistics. In general, the faculty recommends that students take required courses in the sequence shown below. Student should meet with their faculty advisors to select electives which best suites their interests and goals.

	Fall	Winter	Spring
Year 1	Biostatistics 100A Biostatistics 203A Health Policy & Management 100 or Environmental Health Science 100	Biostatistics 100B Biostatistics 203B (elective) Epidemiology 100A or Environmental Health Sciences 100 or Community Health Sciences 100 or Health Policy & Management 100	Biostatistics 406 Biostatistics elective Epidemiology 100A or Environmental Health Sciences 100 or Community Health Sciences 100 or Health Policy & Management 100 Biostatistics 402A
Year 2	Biostatistics 201A Biostatistics elective or Health Policy & Management 100 or Environmental Health Sciences 100 Biostatistics 400	Biostatistics 201B Biostatistics elective Epidemiology 100A or Environmental Health Sciences 100 or Community Health Sciences 100 or Health Policy & Management 100	Biostatistics elective Biostatistics elective Biostatistics 595

A typical course load consists of 12 units. It's recommended that you consult with your academic advisor if you are considering taking a heavier course load.

M.P.H. PROGRAM IN BIOSTATISTICS: COMPETENCIES

Upon graduation, a student with an M.P.H degree in Biostatistics should have obtained core competencies in public health (including biostatistics, community health sciences, environmental health, epidemiology, health policy and management and cross cutting competencies). A complete list of these competencies is available at <http://ph.ucla.edu/sites/default/files/attachments/Competencies%20for%20FSPH%20degree%20programs%20oct0516.pdf>. In addition, an MPH graduate with specialization in biostatistics should have acquired the following additional competencies:

Additional Discipline Specific Competencies for MPH in Biostatistics:

Code	Competency
G1	Explain the fundamental concepts of statistical analysis such as scientific hypothesis testing, estimation and statistical modeling for datasets from health studies.
G2	Develop analytical skills and obtain broad insights involving the design and analysis of experiments to understand and model the dependence between different variables (e.g. regression), handle missing or incomplete data, and carry out rigorous statistical modeling for data obtained from a variety of public health study designs.
G3	Develop analytical and computational skills for the management, modeling and analysis of public health datasets with several variables that may be dependent on one another using statistically rigorous methods and models.
G4	Consult with public health professionals and researchers helping them design research studies (using statistically rigorous methods for sample size determination and power) and analyzing data obtained from such designs.
G5	Complete a statistical consulting project with a health professional, communicate the findings using a written report and with oral presentations.
G6	Learn statistical programming and computational skills for conducting statistical simulation experiments, designing studies and analyzing public health datasets with several variables and potentially complex relationships.
G7	Describe preferred methodological alternatives to commonly used statistical methods when assumptions are not met.
G8	Develop written and oral presentations based on statistical analyses for

5. THE DOCTOR OF PHILOSOPHY IN BIOSTATISTICS (PH.D.)

PREPARATION FOR THE DEGREE:

Mathematics preparation for the program should include at least two years of calculus. The prior coursework should cover material similar to that contained in the following UCLA courses:

- Mathematics 31A, B Calculus and Analytic Geometry
- Mathematics 32A, B Calculus of Several Variables
- Mathematics 33A, B Matrices, Differential Equations, Infinite Series
- Mathematics 115A Linear Algebra

UCLA students in the M.S Program in Biostatistics who are considering further study in the Ph.D Program should see pages 21-22 for additional information.

REQUIREMENTS FOR THE DEGREE:

1. COURSE REQUIREMENTS:

- Biostatistics 200 A, B, C Methods in Biostatistics
- Biostatistics 202A, B Theoretical Principles of Biostatistics
- Biostatistics 250A, B Linear Models
- Biostatistics 250C Multivariate Biostatistics
- Biostatistics 255A, B Advanced Theoretical Topics in Biostatistics
- Biostatistics 257 Statistical Computing
- Biostatistics 245 & 246 Doctoral Seminar (see note A below)
- Biostatistics 409 Biostatistics Consulting (for note B below)
- Mathematics 131A* Real Analysis
- One 4 unit course in Epidemiology (either Epi 100 or 200A)
- One 4 unit course in broad public health themes (PH 150 or HPM M242)
- Minimum of 6 4-unit elective biostatistics courses (24 units).

The elective courses may be chosen from courses in the 200 series that are numbered 210 and above. Students may also use certain courses from outside the Department of Biostatistics (such as the UCLA Department of Statistics) provided a blue petition is approved in advance of taking the course. (See page 46 for a list of some possible courses).

*Mathematics 131A must be taken year 1 by students with limited or no prior experience to Real Analysis.

Required courses must be taken for a letter grade (except Biostat 245 & 409).

A typical course load is 12 units for first year students. It's recommended that you consult with your academic advisor if you are considering taking a heavier course load.

NOTE A

Beginning in their second year of graduate study at UCLA, all students in the doctoral program must register for Biostatistics 245 which involves attending the Departmental seminar series. In addition, every spring term, doctoral students (who are beyond their first year in graduate study at UCLA) must take Biostatistics 246. Biostatistics 246 helps prepare students to give statistical and scientific presentations.

NOTE B

All registered doctoral students must also enroll in Biostatistics 409 (doctoral statistical consulting seminar: field training course) for two consecutive quarters before advancement to candidacy.

2. WRITTEN EXAMINATIONS:

Students must pass 2 written examinations, the PH.D. Preliminary Exam and the PH.D. Written Qualifying Exam

THE PH.D. PRELIMINARY EXAM

This exam is offered in September just before the beginning of fall classes. Students would generally take this exam in the beginning of their second year of study. Students are expected to pass the exam at a level that would predict successful completion of the Ph.D. program. The Ph.D. Preliminary Examination covers material in the following courses and is normally taken as soon as possible after having satisfactorily completing the relevant coursework:

- Biostatistics 200 A, B and C
- Biostatistics 202 A, B

Students must pass the exam at a level expected of doctoral students. Students have a maximum of two attempts to pass the exam.

THE PHD WRITTEN QUALIFYING EXAM.

This exam is offered in September just before the beginning of fall classes. The scope of the exam includes material from the following courses: Biostatistics, 250A, B, C and 255 A, B. Students would generally take the exam after completing necessary coursework, which typically occurs either in the beginning of their 3rd or 4th year of graduate study.

3. ORAL QUALIFYING EXAM

The oral qualifying exam evaluates the student's understanding of statistical theory, ability to apply the theory, and reviews the proposed dissertation topic. The student should prepare a written dissertation proposal. The proposal should include background, preliminary work and a research plan for carrying out the work. While there are no absolute page requirements, the proposal is typically between 15 to 50 pages with additional pages for figures and references. The proposal should be distributed to

members of the dissertation committee in advance of the exam. Generally, the proposal is expected to be delivered to committee members at least two weeks before the scheduled oral exam; if the student expects that the proposal will be delivered less than two weeks before the exam, the student should check with each committee member for advance approval. During the oral exam, the student will present and defend the proposed work. The student can expect that most of the questions will pertain to the proposal, however additional questions may be asked to assess general understanding of biostatistical principles. The overall objective of the exam is to evaluate whether the student has the ability and adequate plans for conducting Ph.D dissertation research.

The dissertation committee is formed in consultation with the student's advisor/dissertation chair and should consist of 4 faculty members. Special rules apply as to which faculty may serve on the committee and students should check with the SAO (Roxy Naranjo) to confirm that the committee is appropriately composed. For the form and regulations on how to form the doctoral committee visit: <https://grad.ucla.edu/gasaa/library/docnomin.pdf>.

Passing of this examination is required before a student is officially advanced to candidacy. A failed examination may be repeated once on the recommendation of the committee.

4. PH.D. DISSERTATION AND ORAL DEFENSE

The PH.D. Dissertation is original research that advances the field of biostatistics. The dissertation is completed under the guidance of a Biostatistical faculty member who serves as the adviser. Examples of dissertations from previous graduates are available in the Biostatistics Library. After successfully completing a dissertation, an oral examination defending the dissertation is conducted by the dissertation committee. A failed examination may be repeated once on the recommendation of the committee.

NOTES FOR PH.D. APPLICANTS WHO ARE EITHER CURRENTLY IN THE UCLA M.S. PROGRAM IN BIOSTATISTICS OR ARE RECENT GRADUATES OF THE PROGRAM

The following **applies** to students who are currently in the MS degree or have completed the M.S. degree in Biostatistics at UCLA and wish to be considered for the Ph.D program or have been admitted to the Ph.D. program:

- Students who enter the Ph.D program in Biostatistics having completed the UCLA M.S. Program in Biostatistics typically begin their Ph.D. program with year 2 course work in the chart on page 23
- Students who enter the Ph.D program in Biostatistics having completed the UCLA M.S Program in Biostatistics and have previously taken some

Biostatistics electives for their M.S degree that also qualify as electives for the Ph.D. program may apply up to 3 of such 4-unit courses toward the Ph.D. requirement of 6 courses.

- Students who enter the Ph.D program in Biostatistics having completed the UCLA M. S. Program in Biostatistics and whose performance on the M.S comprehensive exam was superior and at a level that indicated the student is prepared to proceed with more advanced doctoral coursework are not required to take the Ph.D preliminary exam.
- Student who entered the Ph.D program in Biostatistics having completed the UCLA M.S. program in Biostatistics and fulfilled the requirement of one-4 unit course in Epidemiology and one-4 unit course in broad public health themes are exempt from such requirement.
- Current M.S. students who plan to apply for admission to the Ph.D. program should take Mathematics 131A during their M.S. program.

EXAMPLE OF A PHD PROGRAM SEQUENCE OF CLASSES

This sequence of classes is intended to serve as a guide for students in the Ph.D program. Students should meet with their advisor to determine the optimal course sequence and to select electives which best suits their interests and goals. The sequence of classes to be taken during the first year of study depends on the student's background. Entering Doctoral students should consult with their academic advisor to determine a sequence of courses to best prepare the student for the written preliminary and qualifying exams.

	Fall	Winter	Spring
Year 1	Biostatistics 200A Biostatistics 202A Public Health 150 or Biostat 203A or Mathematics 131A	Biostatistics 200B Biostatistics 202B Biostatistics 203B or Epi 100 or Mathematics 131A	Biostatistics 200C Biostatistics elective Epidemiology 100A or Mathematics 131A
- Ph.D. Preliminary Examination- Given at the beginning of fall term – Scope of exam: 200A, B, C, 202A, B (see pg. 20)			
Year 2	Biostatistics 250A Biostatistics 255A Biostatistics 245	Biostatistics 250B Biostatistics 255B Biostatistics 245 Biostatistics elective	Biostatistics 250C Biostatistics 257 Biostatistics 245 Biostatistics 246
- Ph.D Qualifying Examination- Given at the beginning of fall term - Scope of exam: 250A, B, C, 255A, B (see pg. 20)			
Year 3	Biostatistics elective Biostatistics 409 Biostatistics 245 Public Health 150 or Biostatistics elective	Biostatistics elective Biostatistics 409 Biostatistics 245 Epidemiology 100 or Biostatistics elective	Biostatistics elective Biostatistics elective Biostatistics 245 Biostatistics 246

PH.D PROGRAM IN BIOSTATISTICS: COMPETENCIES

Upon graduation, a student with a PH.D degree in Biostatistics should have acquired the following competencies

A: Develop skills to serve as an effective biostatistician on a collaborative team of scientists working on public health problems.

- A1 Collaborate with researchers to formulate the aims of a public health research project.
- A2 Formulate a public health or scientific question in statistical terms.
- A3 Identify the strengths and weaknesses of different study designs to address public health and scientific questions; communicate these issues to public health researchers.
- A4 Identify and implement steps necessary to insure the quality of data collected in a study.
- A5 Conduct appropriate statistical analyses of study data and interpret the results.
- A6 Effectively communicate the assumptions and results of analyses through oral and written communications to the collaborative team.
- A7 Develop skills necessary to promote collegiality in a collaborative team of scientists.
- A8 Research biostatistical methods and computational resources for collaborative research.
- A9 Adhere to and promote high ethical standards in the conduct of studies, including data collection, statistical analysis, and publication.

B: Develop skills to enable life-long learning in biostatistics.

- B1 Develop ability to critically read statistical methodological literature.
- B2 Develop ability to critically read literature on contemporary public health problems and to identify the salient statistical issues.
- B3 Develop ability to comprehend and be engaged in seminars and presentations on biostatistical research.
- B4 Develop ability to comprehend seminars and presentations in public health sciences and to distill the critical and salient statistical issues
- B5 Develop ability to evaluate and incorporate new and evolving computational and digital technologies into biostatistical work.

PH.D PROGRAM COMPETENCIES CONTINUED

C: Perform and publish original research in the theory and methodology of biostatistics.

- C1 Gauge the statistical skill set of an audience to appropriately customize the level of biostatistical presentations.
- C2 Effectively communicate statistical concepts and reasoning to public health collaborators.
- C3 Learn to write and disseminate substantive field publications and communicate the statistical portion of the methodology to a substantive field audience.
- C4 Learn digital tools useful for communication.
- C5 Be able to articulate interdisciplinary approaches to solving public health problems.
- C6 Develop software and digital tools to implement novel biostatistical methodologies.
- C7 Organize and present effective seminars on biostatistical research.

D: Effectively communicate biostatistical concepts, methods and analyses to scientists, public health professionals, students and other biostatisticians

- D1 Gauge the statistical skill set of an audience to appropriately customize the level of biostatistical presentations.
- D2 Become an effective biostatistics teacher of students who are not biostatistics majors but wish to apply biostatistics to their substantive fields.
- D3 Become an effective biostatistics teacher of students whose goals are to become professional biostatisticians.
- D4 Effectively communicate statistical concepts and reasoning to public health collaborators.
- D5 Learn to write and publish biostatistical methodology in biostatistical journal articles and books.
- D6 Learn to write and publish substantive field publications and communicate the statistical portion of the methodology to a substantive field audience.
- D7 Learn current and future digital tools useful for communication.
- D8 Become an effective leader in the statistical or public health communities.

6. THE DOCTOR OF PUBLIC HEALTH IN BIOSTATISTICS (DR.P.H.)

PREPARATION FOR THE DEGREE:

Mathematics and statistics preparation for the program should include at least two years of calculus:

- | | |
|---------------|---|
| • Math 31A, B | Calculus and Analytic Geometry |
| • Math 32A, B | Calculus of Several Variables |
| • Math 33A, B | Matrices, Differential Equations, Infinite Series |
| • Math 115A | Linear Algebra |

Public health preparation for the program must include the following courses (or equivalent). These courses would typically have been taken as part of an M.P.H program:

- Com Health Sciences 100
- Environmental Health 100 or 101
- Epidemiology 100
- Health Policy & Management 100

The above 4 core courses in public health may be waived if the student has taken a similar college-level course elsewhere and can pass the waiver examination. For the most updated information on waivers, refer to the public health orientation packet and contact the respective departments. If you have not taken these courses, include them in your course of study after admission.

REQUIREMENTS FOR THE DEGREE:

1. COURSE REQUIREMENTS (UNLESS PREVIOUSLY TAKEN).

- Biostatistics 200 A, B, C Methods in Biostatistics
- Biostatistics 202A, B, C Theoretical Principles of Biostatistics
- Biostatistics M215 Survival Analysis
- Biostatistics 250A, B Linear Models
- Biostatistics 245&246 Doctoral Seminar (see NOTE A below)
- Biostatistics 409 Biostatistics consulting (for 3 consecutive terms; (See Note B below)

- Three graduate-level courses in Biostatistics selected with consent of advisor; courses used for the MS degree at UCLA cannot be used here
- Three courses in the 400 series selected with consent of advisor; courses used for the MS degree at UCLA cannot be used here

Required courses must be taken for a letter grade (except Biostat 245 & 409).

A typical course load is 12 units for first year students. It's recommended that you consult with your academic advisor if you are considering taking a heavier course load.

NOTE A

Beginning in their second year of graduate study at UCLA, all students in the doctoral program must register for Biostatistics 245 which involves attending the Departmental seminar series. In addition, every spring term, doctoral students (who are beyond their first year in graduate study at UCLA) must take Biostatistics 246. Biostatistics 246 helps prepare students to give statistical and scientific presentations.

NOTE B

All registered Dr.P.H doctoral students must also enroll in Biostatistics 409 (doctoral statistical consulting seminar: field training course) for two consecutive quarters before advancement to candidacy.

2. WRITTEN EXAMINATIONS

Students must pass 2 written examinations, the Dr.P.H Preliminary Exam and the Dr.P.H. Written Qualifying Exam

THE Dr.P.H. PRELIMINARY EXAMINATION

This exam is offered in September just before the beginning of fall classes.

Students would generally take this exam in the beginning of their second year of graduate study. The Dr.P.H. Preliminary Examination covers the equivalent of the following courses and is normally taken as soon as possible after having satisfactorily completing the relevant coursework.

- Biostatistics 200 A, B C
- Biostatistics 202 A, B

Dr.P.H. WRITTEN QUALIFYING EXAMINATION

This exam is offered in September just before the beginning of fall classes.

Students would generally take the exam after completing necessary coursework, which typically occurs by the beginning of either, their 3rd or 4th year of graduate study. The scope of the exam includes material from the following courses:

Biostatistics M215, 250A, 250B, as well as all material covered by the Dr.P.H. Preliminary Exam

3. BREADTH REQUIREMENT

Students must take a minimum of 24 units, selected with the consent of the academic advisor, in the 200 or 400 level courses from at least two Fielding School of Public Health departments other than Biostatistics

4. Dr.P.H. ORAL QUALIFYING EXAM

The Dr.P.H oral qualifying exam evaluates the student's understanding of statistical theory, ability to apply the theory, and reviews the proposed dissertation topic. The student should prepare a written dissertation proposal. The proposal should include background, preliminary work and a research plan for carrying out the work. While there are no absolute page requirements, the proposal is typically between 15 to 50 pages with additional pages for figures and references. The proposal should be distributed to members of the dissertation committee in advance of the exam. Generally, the proposal is expected to be delivered to committee members at least two weeks before the scheduled oral exam; if the student expects that the proposal will be delivered less than two weeks before the exam, the student should check with each committee member for advance approval. During the oral exam, the student will present and defend the proposed work. The student can expect that most of the questions will pertain to the proposal, however additional questions may be asked to assess general understanding of biostatistical principles. The overall objective of the exam is to evaluate whether the student has the ability and adequate plans for conducting and completing the Dr.P.H. dissertation.

The dissertation committee is formed in consultation with the advisor and should consist of 4 faculty members. Special rules apply as to which faculty may serve on the committee and students should check with Roxy Naranjo to confirm that the committee is appropriately composed.

For the form and regulations on how to form the doctoral committee visit: <https://grad.ucla.edu/gasaa/library/docnomin.pdf>.

Passing of this examination is required before a student is officially advanced to candidacy. A failed examination may be repeated once on the recommendation of the committee.

5. Dr.P.H DISSERTATION AND ORAL DEFENSE

The Dr.P.H. dissertation is original work that is focused primarily on the application of the field of biostatistics to advance public health. The dissertation is completed under the guidance of a Biostatistical faculty member who serves as the adviser. Examples of dissertations from previous graduates are available in the Biostatistics Library. After successfully completing a dissertation, an oral examination defending the dissertation is conducted by the dissertation committee. A failed examination may be repeated once on the recommendation of the committee.

EXAMPLE OF A Dr. P.H. SEQUENCE OF CLASSES

This sequence of classes is intended to serve as a guide for students in the DrPH program. In general, the faculty recommends that students take required courses in the sequence shown below. Student should meet with their faculty advisors to select electives which best suits their interests and goals.

	Fall	Winter	Spring
Year 1	Biostatistics 200A Biostatistics 202A Biostatistics 203A	Biostatistics 200B Biostatistics 202B Biostatistics 203B	Biostatistics 200C Biostatistics elective SPH elective
-Dr.P.H. Preliminary Examination- Given at the beginning of fall term of year 2 Scope of Exam: 200A, B, C, 202A, B (see page 25)			
Year 2	Biostatistics 250A Biostatistics M215 Biostatistics 245 SPH elective	Biostatistics 250B Biostatistics 245 Biostatistics elective SPH elective	Biostatistics elective Biostatistics 245 Biostatistics 246 SPH elective
- Dr.P.H. Qualifying Examination- Given at the beginning of fall term of year 3 Scope of Exam: M215, 250A, B, as well as all material covered by the Dr.P.H. Preliminary Exam			
Year 3	Biostatistics 409 Biostatistics 245 SPH elective	Biostatistics 409 Biostatistics 245 SPH elective	Biostatistics 245 Biostatistics 246

Dr.P.H PROGRAM IN BIOSTATISTICS: COMPETENCIES

Upon graduation, a student with a Dr.P.H degree in Biostatistics should have acquired the following competencies

A: Develop skills to become an effective leader in the application of biostatistical principles to health-related problems.

- A1 Become an effective leader in the statistical and or public health communities.
- A2 Develop skills, knowledge and confidence to enable the creation of public health projects including subject matter relevance, design, and public health significance.
- A3 Develop skills necessary to promote collegiality in a collaborative team of scientists.
- A4 Develop management and scientific skills to effectively lead a public health project as principal investigator or chief scientist.

B: Develop skills to serve as an effective biostatistician on a collaborative team of scientists working on public health problems.

- B1 Collaborate with researchers to formulate the aims of a public health research project.
- B2 Formulate a public health question in statistical terms.
- B3 Identify the strengths and weaknesses of different study designs to address public health and scientific questions; communicate these issues to public health researchers.
- B4 Assist in the development of data collection tools; evaluate these tools from a statistical vantage point.
- B5 Identify and implement steps necessary to insure the quality of data collected in a study.
- B6 Conduct appropriate statistical analyses of study data and interpret the results.
- B7 Effectively communicate the assumptions and results of analyses through oral and written communications to the collaborative team.
- B8 Research biostatistical methods and computational resources for collaborative research.
- B9 Adhere to and promote high ethical standards in the conduct of studies, including data collection, statistical analysis, and publication.

C: Effectively communicate biostatistical concepts, methods and analyses to scientists, public health professionals, students and other biostatisticians

- C1 Gauge the statistical skill set of an audience to appropriately customize the level of biostatistical presentations.
- C2 Become an effective biostatistics teacher of students who are not biostatistics majors but wish to apply biostatistics to their substantive fields.
- C3 Become an effective biostatistics teacher of students whose goals are to become professional biostatisticians.
- C4 Effectively communicate statistical concepts and reasoning to public health collaborators.
- C5 Learn to write and disseminate substantive field publications and communicate the statistical portion of the methodology to a substantive field audience.
- C6 Learn digital tools useful for communication.
- C7 Be able to articulate interdisciplinary approaches to solving public health problems.
- C8 Become an effective spokesperson for promoting the application of good statistical practice in public health.

D: Perform and disseminate work applying biostatistical principles to address important problems in public health and related fields.

- D1 Critically review and interpret the biostatistical literature relevant to the application.
- D2 Write and present effective and clear reports or publications about the application of statistical methods to health problems.
- D3 Develop software and digital tools as necessary to apply statistical methodology.
- D4 Develop the skills to become sufficiently knowledgeable about the health related subject-matter to be able to make significant contributions.
- D5 Understand and be able to effectively communicate the public health significance of the problems being addressed.

E: Develop skills to enable life-long learning in biostatistics applied to public health

- E1 Develop ability to critically read statistical methodological literature relevant to public health problems.
- E2 Develop ability to critically read literature on contemporary public health problems and to identify the salient statistical issues.
- E3 Develop ability to comprehend and be engaged in seminars and presentations on biostatistical research.
- E4 Develop ability to comprehend seminars and presentations in public health sciences and to distill the critical and salient statistical issues.
- E5 Develop ability to evaluate and incorporate new and evolving computational and digital technologies into biostatistical work.

7. ACADEMIC YEAR 2018-2019

ACADEMIC CALENDAR

The academic calendar for the current and future years is available at

<http://www.registrar.ucla.edu/Calendars/Annual-Academic-Calendar>

Fall Quarter 2018	
Quarter begins	Monday, September 24
Instruction begins	Thursday, September 27
Study List deadline (becomes official)	Friday, October 12
Veterans Day holiday	Monday, November 12
Thanksgiving holiday	Thursday-Friday, November 22-23
Instruction ends	Friday, December 7
Common final exams	Saturday-Sunday, December 8-9
Final examinations	Monday-Friday, December 10-14
Quarter ends	Friday, December 14
Christmas holiday	Monday-Tuesday, December 24-25
New Year's holiday	Monday-Tuesday, December 31-January 1
Winter campus closure	TBD
Winter Quarter 2019	
Quarter begins	Wednesday, January 2
Instruction begins	Monday, January 7
Study List deadline (becomes official)	Friday, January 18
Martin Luther King, Jr, holiday	Monday, January 21
Presidents' Day holiday	Monday, February 18
Instruction ends	Friday, March 15
Common final exams	Saturday-Sunday, March 16-17
Final examinations	Monday-Friday, March 18-22
Quarter ends	Friday, March 22
Spring Quarter 2019	
Quarter begins	Wednesday, March 27
César Chávez holiday	Friday, March 29
Instruction begins	Monday, April 1
Study List deadline (becomes official)	Friday, April 12
Memorial Day holiday	Monday, May 27
Instruction ends	Friday, June 7
Common final exams	Saturday-Sunday, June 8-9
Final examinations	Monday-Friday, June 10-14
Quarter ends	Friday, June 14
Commencement Ceremonies 2019	<u>https://www.commencement.ucla.edu/</u>

TENTATIVE BIOSTATISTICS COURSE SCHEDULE 2018-2019

For the most updated course schedule information and classroom assignments, visit:

<https://sa.ucla.edu/ro/Public/SOC>

FALL 2018

		<u>Instructor</u>	<u>Time/Day</u>
Biostat 100A	Introduction to Biostatistics	D. Gjertson	MWF 1pm-3pm
Biostat 200A	Methods in Biostatistics A	R. Brookmeyer	T R 10-12pm
Biostat 201A	Topics in Applied Regression	T. Belin	MWF 9am-10am
Biostat 202A	Theoretical Principles of Biostatistics	D. Senturk	MWF 10am-12pm
Biostat 203A	Intro to Data Management and Statistical Computing	H. Aralis	T R 1-2:30pm
Biostat 213	Intro do Computational Methods in Biostat	C. Ramirez	MW 9am-11am
Biostat M215	Survival Analysis	G. Li	TR 10am-12pm
Biostat M235	Casual Inference	T. Belin	MW 5-7pm
Biostat 245	Advanced Seminar in Biostatistics	W. Wong	W 3pm-5pm
Biostat 250A	Linear Statistical Models	W. Wong	MWF 1pm-2pm
Biostat 255A	Advanced Probability in Biostatistics	D. Dabrowska	T R 1-3pm
Biostat 273	Classification and Regression Trees (CART) and Other Algorithms	C. Ramirez	MW 1pm-3pm
Biostat 402B	Biostatistical Consulting	D. Elashoff	R 3pm-5pm MTWRF 1pm-3pm
Biostat 409	Doctoral Consulting Seminar	D. Gjertson	T 9-11am

WINTER 2019 (TENTATIVE)

Biostat 100B	Introduction to Biostatistics	R. Brookmeyer
Biostat 200B	Methods in Biostatistics B.	K. Crespi
Biostat 201B	Topics in Applied Regression	C. Sugar
Biostat 202B	Theoretical Principles of Biostatistics	D. Telesca
Biostat M234	Longitudinal Data	R. Weiss
Biostat 245	Advanced Seminar in Biostatistics	D. Telesca
Biostat 250B	Linear Statistical Models	S. Banerjee
Biostat 255B	Advanced Methods of Mathematical Statistics	D. Dabrowska
Biostat 203B	Intro to Data Science	H. Zhou
Biostat 402B	Biostatistical Consulting	F. Yu
Biostat 409	Doctoral Consulting Seminar	D. Gjertson

SPRING 2019 (TENTATIVE)

Biostat 410	Introduction to Biostatistics	M. Lee
Biostat 200C	Methods in Biostatistics C	W. Wong
Biostat 231	Sample Size Methods	K. Crespi
Biostat 233	Statistical Issues in Global Health	R. Brookmeyer
Biostat M236	Longitudinal Data	R. Weiss
Biostat M238	Clinical Trials	G. Li
Biostat M239	Mathematical & Statistical Phylogenetics	M. Suchard
Biostat 241	Spatial Modeling and Data Analysis	S. Banerjee
Biostat 244	Master's Seminar & Research Resources	C. Ramirez
Biostat 245	Advanced Seminar in Biostatistics	R. Weiss
Biostat 246	Advanced Seminar in Biostatistics	C. Sugar
Biostat 250C	Multivariate Biostatistics	D. Telesca
Biostat 275	Adv. Survival Analysis	D. Dabrowska
Biostat 277	Robustness & Modern Nonparametrics	G. Li
Biostat 402A	Principles of Biostatistical Consulting	D. Gjertson
Biostat 406	Applied Multivariate Biostatistics	D. Telesca
Biostat 410	Statistical Methods in Clinical Trials	M. Lee
Biostat 402B	Biostatistical Consulting	D. Elashoff
Biostat 279	Optimal Design Theory and Application	W. Wong
Biostat 257	Statistical Computing	H. Zhou

8. ACADEMIC STANDARDS & PROCEDURES AT UCLA

GENERAL INFORMATION

General regulations concerning graduate courses, standards of scholarship, disqualifications, appeals, leave of absences, normal progress toward degree, withdrawals and other matters can be found at:

<https://grad.ucla.edu/gasaa/library/spfqs.pdf>

The site also provides detailed information and sets forth general policies regarding completion of degree requirements, master's and doctoral committees and examinations.

The school-wide Fielding School of Public Health Student Affairs Office provides oversight and guidance of school-wide and departmental graduate program affairs, including admissions processing, degree processing, class scheduling, funding, orientation and graduation preparations, and general counseling to prospective, new and continuing students. Hours and Location: Monday-Friday 10:00am-3:00pm. Room A1-269 Center for Health Sciences (A-floor). Phone Number: (310) 825-5524.

ENGLISH AS A SECOND LANGUAGE

All non-native speakers of English new to UCLA are required to fulfill UCLA ESL requirements by taking the English as a Second Language Placement Exam (ESLPE). Based upon performance on this examination, students may be exempt from enrolling in UCLA ESL classes, or may be required to complete one or more courses in the English 33 series. Students may only take the exam twice. Graduate students, who plan to work as teaching assistants (TAs) and are nonnative English-speaking international students, are required to take the Test of Oral Proficiency (TOP), which is administered by the Office of Instructional Development.

Please refer to <http://www.wp.ucla.edu/>

FULL TIME STUDENT STATUS

To be considered a full time UCLA graduate student, students must be enrolled for a minimum of 12 per quarter. Students holding GSR, teaching assistantship or special reader positions must be enrolled for a minimum of 12 units.

ADVANCEMENT TO CANDIDACY

MASTER'S DEGREE

Students who wish to graduate in the spring quarter must petition for advancement to candidacy prior to the deadline. This deadline will be announced at the graduation workshop, which will be held in February. Advancement to candidacy is a requirement for all M.S. and M.P.H. degree candidates. If you miss the workshop, petitions for advancement to candidacy can be picked up in the Student Affairs Office, Room A1-269 CHS. The forms must be completed and returned to the Student Affairs Office. Please be sure to complete all required information and follow special instructions per the direction on the forms or by the Student Affairs Office Staff.

Students who wish to graduate in the fall or winter quarters, must petition for Advancement to Candidacy prior to the end of the second week of the chosen quarter. The Student Affairs Office posts the specific deadlines.

In addition to completing all the required course work, M.S. students are required to complete a written M.S. report as part of their graduation requirement. This report is part of the Biostatistics 596 course requirement and is due in the final term of study, usually spring term. The final version of the M.S. report should be emailed to Roxy Naranjo once it's approved by the M.S. report advisor.

DOCTORAL DEGREE

Advancement to candidacy is also a requirement for students in the Ph.D. and Dr.P.H. programs. To obtain the necessary forms and policy on how to officially form your Doctoral Dissertation Committee visit: <http://www.qdnet.ucla.edu/gasaa/library/degreeinfo.htm#Doctoral>

Before advancing to candidacy, doctoral students must form their doctoral dissertation committee by filing out the Nomination of Doctoral Committee form. Student normally form their dissertation doctoral committee upon completion of the required coursework (or during the term completing the last required courses).

Once the doctoral committee is officially approved by Graduate Division, students may take their Oral Qualifying Examination & Advancement to Candidacy. Students are responsible for informing their committee members of the date and time that best works for everyone for the Oral Qualifying & ATC. They must also inform Roxy Naranjo of the date and time and she help secure a meeting room for the exam.

ACADEMIC DISQUALIFICATION AND APPEAL

A graduate student may be disqualified from continuing in the graduate program for a variety of reasons. One reason is failure to maintain the minimum cumulative grade point average (3.0). The conditions when that could happen and procedures for appeal are described at <https://grad.ucla.edu/gasaa/library/spfqs.pdf>. Students feeling academically challenged should consult with their advisers.

ACADEMIC INTEGRITY

With its status as a world-class research institution, it is critical that the University uphold the highest standards of integrity both inside and outside the classroom. As a student and member of the UCLA community, you are expected to demonstrate integrity in all of your academic endeavors. Accordingly, when accusations of academic dishonesty occur, The Office of the Dean of Students is charged with investigating and adjudicating suspected violations. Academic dishonesty, includes, but is not limited to, cheating, fabrication, plagiarism, multiple submissions or facilitating academic misconduct. For more information, visit:

<https://www.deanofstudents.ucla.edu/Academic-Integrity>.

LEAVE OF ABSENCE

Continuing graduate students in good academic standing (3.0 GPA or above) who have completed at least one quarter of academic residence at UCLA, may petition to take a leave of absence if approved by the Home Department and the Graduate Division. Graduate students are allowed a maximum of three quarters of official leave of absence. Federal policy governing students on F-1 and J-1 visas restricts leaves of absence to certain conditions. To petition for a leave of absence, fill out a "Leave of Absence Request" form, and submit it to the SPH Student Affairs Office.

For more details: <http://www.gdnet.ucla.edu/gasaa/library/loa.htm>

FILING FEE

The filing fee is used for filing of a dissertation or thesis and/or formal final examination for the doctor's or the master's degree when a candidate has completed all degree requirements. Graduate students (who meet the criteria below) can apply for a Filing Fee and pay a nominal fee in lieu of standard tuition and registration fees. Filing Fee is intended for students who are in good academic standing and who have completed all degree requirements except for filing their dissertation or thesis, submitting their capstone project, or taking their comprehensive exam. Effective Fall 2018, graduate students who are approved to use a Filing Fee will have the entire academic term to complete their degree requirements. While on Filing Fee status, a student may no longer: take courses, be employed by UCLA, receive financial support, or access certain campus services. Please refer to the [Status and Filing Fee Eligibility Flow Chart](#) to assist with determining eligibility for Filing Fee usage.

For detailed information on the filing fee requirements and to access the Filing Fee application, visit: <https://grad.ucla.edu/academics/graduate-study/filing-fee-application/>.

Students may only pay the filing fee one time.

9. LIFE IN THE DEPARTMENT OF BIOSTATISTICS

BIOSTATISTICS STUDENT AFFAIRS OFFICE

The Student Affairs Officer for the Biostatistics Department is Roxy Naranjo. Her office room number is 51-236A CHS, phone number is (310) 267-2186 and her email is rlnaranjo@ph.ucla.edu.

If you have any question about degree requirements or academic procedures, an excellent first step to get your questions answered or issues resolved is to contact Roxy Naranjo.

The Biostatistics Department's Student Affairs Officer (SAO) works with students providing advice on how to get the most out of their graduate experience, navigating relationships with faculty, and the university's policies and procedures. The SAO's main responsibilities include helping students understand and comply with university rules and regulations and assisting them in navigating through administrative issues related to their degree. The SAO is a key resource for students to get assistance on all related student matters. In addition, the Student Affairs Officer also focuses on providing additional assistance to at-risk students who are struggling academically, personally, financially or mentally and help them in finding targeted services to support them.

BIOSTATISTICS FACULTY ADVISING

Students are assigned a faculty advisor prior to the beginning of their academic program. Students should initially contact their advisors to discuss their course of study and thereafter should stay in contact on a regular basis. Students are expected to meet with their advisors at least once per quarter to discuss academic progress, problems, and courses. Students may change advisors. A blue student petition should be used for this request. Approval by the both faculty member and the Biostatistics Department Chair must be obtained.

THE FRANK J. MASSEY BIOSTATISTICS LIBRARY

The Department of Biostatistics Library is named in honor of Frank J. Massey, Jr., Ph.D, a long time UCLA School of Public Health Faculty Member .The library is accessed through the main office of the Department of Biostatistics (51-254A CHS), and is located on the right as you enter the main office.

The Library has books, journals, dissertations from prior graduates and a large conference table. Students are very welcome to work in the library if it has not been previously reserved for an event. The library is also used for Biostatistics faculty meetings, student exams, and other events.

Items may be checked out with the following procedures. Masters' Reports, Journals, and doctoral Dissertations are only for *2-hour* check-out. Bring your student ID & item(s) to Student Affairs Officer Roxy Naranjo for *2-hour* check out. All other books should be checked out using the following procedure: find pocket inside book; fill out book card and file it in box located in the library by author's name. For questions please see Roxy Naranjo, Jasen Okunnuga, or Ivonne Nelson; fill out the check-out sheet located in the blue binder with name, date, and email. To return books, please leave items next to the book catalog and sign-out from the check-out sheet. All check-out items are due within *3 weeks* of borrowed date.



BIostatISTICS STUDENT OFFICE SPACE

The Biostatistics Department has two office rooms for biostatistics graduate students, A1-228 CHS and A1-227 CHS. These offices are located in the lower level of the Fielding School of Public Health.

A1-228 CHS is available to all masters and doctoral students in the Department of Biostatistics

A1-227 CHS is only available to students who have passed the written comprehensive doctoral exam.

To obtain a space, please complete the application provided to you during orientation which can also be found on the Dept. website or email Roxy Naranjo.

BIostatISTICS SEMINAR SERIES

The Department has a regular seminar series which is open to all students and faculty. The seminar speakers include biostatisticians from around the world who come to speak about their work and issues in the field of biostatistics. The seminars are typically held on Wednesdays during the academic year at 3:30PM in one of the lecture halls in the Center for Health Sciences. The seminars generally end by 4:30P.M

Refreshments are available prior to the seminar at 3PM in the Massey Biostatistics library. Please join for informal chatting, socializing and an opportunity to meet the seminar speaker.

Notices are sent by email and posted on the bulletin boards about the upcoming seminar for the week.

BIostatISTICS SOCIAL EVENTS

The Department has several social events each year. We very much want you to come to these events - they let all of us get to know each other in a less formal atmosphere.

Early in the Fall Quarter, the Department sponsors a Welcome-to-UCLA party at the Sunset Canyon Recreation Center on campus. This is a good way to come and meet your fellow students, faculty and families.

We have a pot-luck Holiday Party in December which everyone brings food to share and are usually in the Massey Biostatistics Library.

We have a monthly pizza lunch for students and faculty. Pizza day is normally the second Monday of every month and held in the Biostatistics Library.

STUDENT MAIL

Each student has a folder in which they can receive mail. The folders are located in the main office (51-254 CHS). As you walk in the office, the folders are in a file cabinet on your left. Announcements and mail arriving at the Biostatistics office will be placed in your folder. Students should check their mail folders regularly. Please do not have personal mail sent to the Department.

STUDENT EMPLOYMENT

Graduate students in biostatistics are often able to find employment related to biostatistics (e.g. special readers, teaching assistants (TAs), or graduate student researchers (GSRs). The GSR (Graduate Student Researcher) and special reader may provide fee remissions in addition to the standard pay. In some cases, GSR can also qualify for non-resident tuition remission.

If you are seeking employment a good first step is to let Roxy Naranjo know of your interests. If you are interested in being a special reader, you should apply at least six weeks in advance to ensure that you receive full consideration for the following quarter. The applications are on the department web site at http://www.biostat.ucla.edu/student-employment_ Applications must be updated every quarter. Submit your application(s) to Roxy Naranjo via email at rlnaranjo@ph.ucla.

In addition, consider contacting the Career Center (<http://www.career.ucla.edu/>) for work study opportunities, as well as the Financial Aid Office (<http://www.financialaid.ucla.edu/>.)

BLUE PETITION

A blue petition is a form submitted to explain a student's need or desire to be exempted from any rule or regulation of the University. It is the only way to obtain formal approval from the department, the School, the Registrar or whoever has authority over the particular request. For example, a request to waive a required course or to substitute one course for another required course, require blue petitions. The petition will need to be signed by your advisor and Department Chair. The petition is obtained from the Biostatistics Department Student Affairs Officer (Roxy Naranjo). Blue petitions should be filed prior to any variation from stated policy not after. Check with Roxy Naranjo to confirm you are following the correct procedures.

10. LIFE IN AND AROUND UCLA

STUDENT HEALTH SERVICES

ARTHUR ASHE STUDENT HEALTH AND WELLNESS CENTER

All registered graduate students may use the Arthur Ashe Student Health and Wellness Center, an outpatient clinic geared to the special needs of students at UCLA. The Ashe Center offers a full range of clinical and support services, most of which are prepaid by student registration fees. The clinical staff is comprised of highly qualified doctors, nurse practitioners, and nurses.

<http://www.studenthealth.ucla.edu/default.aspx>

MEDICAL INSURANCE REQUIREMENT / WAIVING SHIP

As a condition of registration, the University requires that all graduate and professional students, including international students on non-immigrant visas, have medical insurance coverage that meets the University's minimum requirements. Contact the Insurance Office on the fourth floor of the Arthur Ashe Student Health and Wellness Center for details regarding the campus Student Health Insurance Plan <http://www.studenthealth.ucla.edu/CustPages/Insurance.aspx>

COUNSELING CENTER- COUNSELING & PSYCHOLOGICAL SERVICES (CAPS)

The Center provides confidential individualized therapy and psychiatric care, provided by a diverse and multiculturally competent professional staff. CAPS is a warmly welcoming environment located centrally on the UCLA campus. CAPS also provides a range of programs to promote mental health, emotional resilience and wellness throughout the campus community. The 24-hour telephone access line is (310-825-0768. Crisis counseling available 24-hours a day by phone.

<http://www.counseling.ucla.edu/>

John Wooden Center West
221 Westwood Plaza

CENTER FOR ACCISABLE EDUCATION (CAE)

The [UUCLA Center for Accessible Education](#) (CAE) facilitates academic accommodations for regularly enrolled, matriculating students with disabilities. The CAE provides access to the numerous educational opportunities available to students on our campus and empowers students to realize their academic potential. To obtain disability-related accommodations and services through the CAE, students should complete a Request for Services form and upload appropriate documentation. Students may also download and complete a printable version of the Request for Services form

and [email](#) or fax it to the CAE at (310) 825-9656. For more information visit: www.cae.ucla.edu.

SAFETY

The Evening Van Service provides a safe means of transportation around campus during the evening hours. The vans provide transportation between campus buildings, on-campus housing and nearby residential areas. The service is free of charge and available to all UCLA students, staff, faculty and visitors. For added safety, the vans are driven by Community Service Officers (CSOs) who carry two-way radios, providing a direct link to the UCLA Police Department

PUBLIC TRANSPORTATION

Refer to the website to obtain more information regarding transportation in and around UCLA. <https://main.transportation.ucla.edu/>

PARKING

Information on how to apply for a parking permit, van pool, ride share, GoBruin bus program and other available transportation services, go to: <https://main.transportation.ucla.edu/campus-parking>. Their office is located at 555 Westwood Plaza, corner of Westwood Blvd. & Strathmore Avenue (in front of Parking Structure 8, Level 2).

12. LIST OF ALL BIostatISTICS COURSES

Below is a list of all biostatistics courses that are offered. However, please note that many courses are not offered each year. Course descriptions and further details can be found at <http://www.registrar.ucla.edu>

- 200A. Methods in Biostatistics A, Units: 4,
Preparation: at least one year of calculus
- 200B. Methods in Biostatistics B, Units: 4,
Preparation: Linear Algebra. Pre-requisite Biostat 200A.
- 200C. Methods in Biostatistics C, Units: 4,
Pre-requisites: Previous course in linear algebra; Biostatistics 200A, and 200B
- 201A. Topics in Applied Regression, Units: 4,
Pre-requisites: Biostat 100A and 100B, or Biostat 200A and 200B
- 201B. Topics in Applied Regression, Units: 4,
Pre-requisite: Biostat 201A.
- 202A. Mathematical Statistics A, Units: 4,
- 202B. Mathematical Statistics B, Units: 4,
Pre-requisite: Biostat 202A.
- 202C. Theory of Bayesian Statistics, Units: 4,
Pre-requisite: 200A, 200B, 202A, 202B, or equivalent, or consent of instructor.
- 203A. Introduction to Data Management and Statistical Computing, Units: 4
- M208. Introduction to Demographic Methods, Units: 4,
Preparation: one introductory statistics course.
- M210. Statistical Methods for Categorical Data, Units: 4,
Pre-requisites: Biostat 100B or Biostat 200B or, Statistics 100B.
- 212. Distribution Free Methods, Units: 4,
Pre-requisite: Biostat 200B or Statistics 100B.

213. Introduction to Computational Methods in Biostatistics, Units: 4,
Pre-requisites: Biostat 200A, or Statistics 100B.
214. Finite Population Sampling, Units: 4,
Pre-requisites: Biostat 200A, 200B, 202B.
- M215. Survival Analysis, Units: 4,
Pre-requisite: Biostat 202B or Statistics 100C.
219. Special Topics: Supplemental Topics, Units: 4,
Pre-requisite: course 202B.
230. Statistical Graphics, Units: 4,
Pre-requisite: Biostat 200A (may be taken concurrently).
231. Statistical Power and Sample Size Methods for Health Research, Units: 4,
Pre-requisites: Biostat 200A, 200B.
- M232. Statistical Analysis of Incomplete Data, Units: 4,
Pre-requisites: Biostat 200C, 202B or equivalent.
233. Statistical Issues in Global Health, Units: 4,
Pre-requisites: Biostat 200C; Recommended M215.
- M234. Applied Bayesian Inference, Units: 4,
Pre-requisite: Biostat 200B or another substantial regression course.
- M235. Causal Inference, Units: 4,
Pre-requisite: 200C, 202B or equivalent.
- M236. Longitudinal Data, Units: 4,
Pre-requisite: Biostat 200B or another substantial regression course.
- M237. Applied Genetic Modeling, Units: 4,
Pre-requisite: 200B, 202B (may be taken concurrently) or equivalent course or
consent of instructor.
- M238. Methodology of Clinical Trials, Units: 4,
Pre-requisite: Biostat 200B.
- M239. Mathematical and Statistical Phylogenetics, Units: 4
241. Spatial Modeling and Data Analysis for Health Sciences, Units: 4,
Pre-requisites: Biostat 200A, 200B, 202A, 202B.

244. Master's Seminar and Research Resources for Graduating Biostatistics M.S. Students, Units: 4
245. Advanced Seminar: Biostatistics, Units: 2,
Requisites: Biostat 200C, 202B
- 250A. Linear Statistical Models, Units: 4,
Recommended preparation: statistical theory and linear algebra.
- 250B. Linear Statistical Models, Units: 4,
Pre-requisites: Biostat 200A, 200B, 200C, 250A.
- 250C. Multivariate Biostatistics, Units: 4,
Pre-requisites: Biostat 250A, 250B. Recommended requisites: Biostat 255A, 255B.
- 255A. Advanced Probability and Statistics, Units: 4,
Pre-requisites: Biostat 202A or equivalent.
- 255B. Advanced Probability and Statistics, Units: 4,
Pre-requisites: Biostat 255A or consent of instructor, Mathematics 131A.
270. Stochastic Processes, Units: 4,
Preparation: upper division mathematics (including statistics and probability).
- M272. Theoretical Genetic Modeling, Units: 4,
Pre-requisites: Mathematics 115A, 131A, Statistics 100B.
273. Classification and Regression Trees (CART) and Other Algorithms, Units: 4,
Pre-requisite: Biostat 200C.
275. Advanced Survival Analysis, Units: 4,
Pre-requisites: Biostat 250A, 255A.
276. Inferential Techniques that Use Simulation, Units: 4,
Pre-requisites: Statistics 200A, 200B. Recommended: Biostat 213.
277. Robustness and Modern Nonparametrics, Units: 4,
Pre-requisites: Statistics 200A.
279. Optimal Design Theory and Application, Units: 4,
Preparation: Basic programming skills. Pre-requisites: Statistics 200B.
- M280. Statistical Computing, Units: 4,
Pre-requisites: Mathematics 115A, Statistics 100C.

285. Advanced Topics: Recent Developments, Units: 4
296. Seminar: Research Topics in Biostatistics Units: 1 to 4
375. Teaching Apprentice Practicum, Units: 1 to 4
400. Field Studies in Biostatistics, Units: 4
- 402A. Principles of Biostatistical Consulting, Units: 2,
Pre-requisite: Biostat 100B or Biostat 200B.
- 402B. Biostatistical Consulting, Units: 4,
Pre-requisite: Biostat 402A.
- M403B. Computer Management and Analysis of Health Data Using SAS, Units: 4,
Pre-requisite: courses 100A, 100B (100B may be taken concurrently).
406. Applied Multivariate Biostatistics, Units: 4,
Preparation: At least two upper division research courses. Pre-requisite: Biostat 100B.
409. Doctoral Statistical Consulting Seminar, Units: 2
410. Statistical Methods in Clinical Trials, Units: 4,
Pre-requisite: Biostat 100A, 100B.
411. Analysis of Correlated Data, Units: 4,
Pre-requisite: Biostat 200A.
413. Introduction to Pharmaceutical Statistics, Units: 4,
Pre-requisite: Biostat 100A, 100B.
414. Principles of Sampling, Units: 4,
Pre-requisite: Biostat 100B, Epidemiology 100.
495. Teacher Preparation in Biostatistics, Units: 2
595. Effective Integration of Biostatistical Concepts in Public Health Research, Units: 4,
Pre-requisites: 100A, 100B, 400, 402A.
596. Directed Individual Study or Research, Units: 2 to 8
597. Preparation for Master's Comprehensive or Doctoral Qualifying Examinations,
Units: 2 to 12
599. Doctoral Dissertation Research, Units: 2 to 12

OTHER COURSES OF INTEREST

Some courses from other UCLA departments such as the Department of Statistics may qualify as a Biostatistics elective. You will need approval from your academic advisor and Department Chair. Approval (via blue petition). Approval should be obtained before enrolling in the course not after. Listed below are some possible courses:

Statistics 218	Statistical Analysis of Networks (4)
Statistics M232A	Statistical Modeling and Learning in Vision and Science (4)
Statistics 242	Multivariate Analysis with Latent Variables (4)
Statistics M243	Logic, Causation, and Probability (4)
Statistics C261	Introduction to Pattern Recognition and Machine Learning (4)
Statistics 271	Probabilistic Models of Visual Cortex (4)