Overview of the Graduate Program

2025 DOCTORAL AND MASTERS STUDENT ORIENTATION

UCLA College | Physical Sciences Statistics & Data Science

Introductions:

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Structure of the Core Courses

The core is structured into three tracks:

I. the **theoretical** sequence [200A, 200B, 200C]

II. the **applied** sequence [201A, 201B, 201C]

III. the **computational** sequence [202A, 202B, 202C]

The Core Curriculum

	A (Fall)	B (Winter)	C (Spring)
200 Theory	Applied Probability	Theoretical Statistics	High Dimensional Statistics
201 Applied	Research Design, Sampling, and Analysis	Statistical Modeling and Learning	Advanced Modeling and Inference
202 Computational	Statistics Programming	Matrix Algebra and Optimization	Monte Carlo Methods for Optimization

The Core Curriculum (UCLA General Catalog website)

200A. Applied Probability. (4) Lecture, three hours; discussion, one hour. Requisite: course 100A or Mathematics 170A. Limited to graduate statistics students. Simulation, renewal theory, martingale, and selected topics from queuing, reliability, speech recognition, computational biology, mathematical finance, epidemiology. S/U or letter grading.

200B. Theoretical Statistics. (4) Lecture, three hours; discussion, one hour. Sufficiency, exponential families, least squares, maximum likelihood estimation, Bayesian estimation, Fisher information, Cramér/Rao inequality, Stein's estimate, empirical Bayes, shrinkage and penalty, confidence intervals. Likelihood ratio test, p-value, false discovery, nonparametrics, semi-parametrics, model selection, dimension reduction. S/U or letter grading.

200C. Large Sample Theory, Including Resampling. (4) Lecture, three hours; discussion, one hour. Survey of modern techniques in analyzing high-dimensional and nonparametic estimation problems. Emphasis on non-asymptotic bounds via concentration inequalities. S/U or letter grading.

The Core Curriculum (UCLA General Catalog website)

201A. Research Design, Sampling, and Analysis. (4) Lecture, three hours; discussion, one hour. Designed for graduate students. Basic principles, ANOVA block designs, factorial designs, unequal probability sampling, regression estimation, stratified sampling, and cluster sampling. S/U or letter grading.

201B. Statistical Modeling and Learning. (4) Lecture, three hours; discussion, one hour. Requisites: courses 200A, 201A. Methods of model fitting and parameter estimation, with emphasis on regression and classification techniques, including those from machine learning. Interest in either obtaining suitable conditional expectation function or estimating meaningful parameters of underlying probabilistic model to make inferences or predictions from data. Focus on what is to be done when linear models are not appropriate and may produce misleading estimates. Coverage of classical must know model fitting and parameter estimation techniques such as maximum likelihood fitting of generalized linear models. Exploration of broader regression/classification techniques that have been ubiquitous in machine learning literature, with special attention to regularization and kernelized methods. S/U or letter grading.

The Core Curriculum (UCLA General Catalog website)

201C. Advanced Modeling and Inference. (4) Lecture, three hours; discussion, one hour. Strongly recommended requisites: courses 200B, 201B.

Designed for graduate students. Introduction to advanced topics in statistical modeling and inference, including Bayesian hierarchical models, missing data problems, mixture modeling, additive modeling, hidden Markov models, and Bayesian networks. Coverage of computational methods used and developed for these models and problems, such as EM algorithm, data augmentation, dynamic programming, and belief propagation. S/U or letter grading.

The Core Curriculum (UCLA General Catalog website)

202A. Statistics Programming. (4) Lecture, three hours; discussion, one hour. Topics include programming environments/languages such as UNIX, UNIX shell, Python, R, and Processing and data technologies/formats such as relational databases/SQL and XML, with emphasis on complex data types, including large collections of textual data, GPS traces, network logs, and various online sources. S/U or letter grading.

202B. Matrix Algebra and Optimization. (4) Lecture, three hours; discussion, one hour. Recommended requisite: course 202A. Survey of computational methods that are especially useful for statistical analysis, with implementations in statistical package R. Topics include matrix analysis, multivariate regression, principal component analysis, multivariate analysis, and deterministic optimization methods. S/U or letter grading.

The Core Curriculum (UCLA General Catalog website)

202C. Monte Carlo Methods for Optimization. (4) Lecture, three hours; discussion, one hour. Requisite: course 202B.

Monte Carlo methods and numerical integration. Importance and rejection sampling. Sequential importance sampling. Markov chain Monte Carlo (MCMC) sampling techniques, with emphasis on Gibbs samplers and Metropolis/Hastings. Simulated annealing. Exact sampling with coupling from past. Permutation testing and bootstrap confidence intervals. S/U or letter grading.

The Core Curriculum (UCLA General Catalog website)

290. Current Literature in Statistics. (2) Seminar, one hour. Topics in various statistical areas by means of lectures and informal conferences with staff members. S/U grading.

Regular weekly seminar on Thursdays (time TBD)

Students are encouraged to have lunch with the speaker after the talk. Depending on the speaker's schedule, the Faculty Seminar Organizer will also send out invitations for individual meetings.

The Core Curriculum (UCLA General Catalog website)

296. Participating Seminar: Statistics Units: 1 to 2
Seminar and discussion by staff and students. S/U grading.
"includes informal discussion, perhaps in lab groups. Does not count to degree requirement"

596. Directed Individual Study or Research Units: 2 to 8
Tutorial, to be arranged. Supervised individual reading and study on project approved by a faculty member. May be repeated for credit. Letter grading.
"working with a professor on research or preparing for research"
Up to eight units can count towards the degree requirements"

599. PhD Dissertation Research Units: 2 to 12
Tutorial, to be arranged. Preparation: *advancement to PhD candidacy*.
Study and research for PhD dissertation. May be repeated for credit. S/U grading.
"For post-Oral Dissertation Defense research work"

The Core Curriculum (UCLA General Catalog website)

598. MS Thesis Research Units: 2 to 12
Tutorial, to be arranged. *Designed for second-year statistics MS students*. Study and research for MS thesis. May be repeated for credit. S/U grading.

"working with a professor on research, especially for the M.S. Thesis. Up to eight units can count towards the degree requirements"

PhD Program Degree Requirements

Course Requirements:

- 54 units of approved graduate course work with a grade of B- or better and maintain a 3.0 GPA each quarter
- 40 units (10 courses) must be taken within the Department of Statistics & Data Science
- 14 units or 4 classes may be taken from related departments
- Students are strongly encouraged to take Statistics 200ABC, 201ABC, and 202ABC
- Students are required to take Statistics 290 (Current Literature in Statistics) for at least 6 quarters.
- Three classes (or 12 units per term) is considered the normal enrollment for graduate students.

Ph.D. Program Time-to-Degree

- Completion of the doctorate degree generally takes five years or 15 quarters.
- A faculty committee meets in the Fall to discuss the progress of all doctoral students.
- Students who are not making satisfactory progress may lose their financial support as well as termination from the program.
- Students are considered "on-track" if both the written and oral qualifying exams are completed at the end of their first & second year, respectively.

Qualifying Examinations

Written Qualifying examination

- The written qualifying examination consists of a high-quality paper, solely authorized by the student.
- This paper can be a **research paper** containing an original contribution, or a focused critical **survey paper**. The paper should demonstrate that the student understands and can integrate and communicate ideas clearly and concisely.
- The paper should be approximately 20 pages, single-spaced, and the style should be suitable for submission to a first-rate journal or technical conference.
- Students making satisfactory progress are expected to take the written qualifying examination in the summer following their first year of study

Doctoral Committee

After passing the written qualifying examination, students select a doctoral committee

- The doctoral committee consists of a minimum of four members.
- A minimum of three members must hold current UCLA rank of professor (any rank), with two being professors or associate professor.
- The chair must hold an appointment in the Department of Statistics & Data Science
- Only one committee member who is faculty at another accredited university or college (UC or non-UC) may serve.

Ph.D. Oral Qualifying examination

- The doctoral committee administers the Oral Qualifying Examination, required for ***Advancement To Candidacy***.
- The student should prepare a 60-minute presentation focusing on the research the student plans to complete for their PhD, together with all preliminary results and literature review.
  - Specific details can be found here: https://statistics.ucla.edu/index.php/academics/graduate/ph-d-program/
- Students making satisfactory progress are expected to take the Oral Qualifying Examination by the end of their second year of study.

Final Oral Examination/Final Defense

- The doctoral degree program requires the completion of an approved dissertation that demonstrates the student's ability to perform original, independent research and constitutes a distinct contribution to knowledge in the principal field of study.
- The doctoral committee reviews the dissertation at the **Final Oral Examination (Defense of the Dissertation)** . Prior to the Final Oral Examination, the written dissertation must be submitted to the committee at least two weeks in advance.
- Typically, an oral presentation is given in defense of the dissertation and is of length 45 minutes, followed by questions from the doctoral committee.

General Degree Process for PhD

1. Start thinking about who you would like as your faculty advisor during your first year. Faculty contact information can be found on the website.
2. Successfully Complete Written Qualifying Exam
3. Submit your **"Nomination of Doctoral Committee"** form to the Graduate Advisor, 4-8 weeks prior to Oral Qualifying Exam.
4. After committee approval from Graduate Division – schedule the Oral Qualifying Exam.
5. Successfully Complete Oral Qualifying Exam
    1. Upon passing the exam, reach out to Student Advisor (Jose) to start the Advancement to Candidacy (ATC) paperwork.
6. Schedule and pass your Final Oral Defense.
7. **File** dissertation. Committee members will approve your dissertation and final oral defense.

Masters Program Degree Requirements

Course Requirements:

- 44 units of approved graduate course work with a grade of B- or better and maintain a 3.0 GPA each quarter
- 32 units (8 courses) must be graduate courses
- 20 units or 5 classes may be taken from related departments
- Students are strongly encouraged to take Statistics 200ABC, 201ABC, and 202ABC
- Students are required to take Statistics 290 (Current Literature in Statistics) for at least 3 quarters. Stats 596 or 598 courses can be taken as needed. Eight units of Stats 596 can count towards your degree requirements.

Masters Program Time-to-Degree

- Students are expected to complete the M.S. degree in six quarters of full-time study.
- A faculty committee meets in the fall to discuss the progress of all Masters' degree students.
- Students who are not making satisfactory progress may lose their financial support as well as termination from the program.
- Unsatisfactory progress will be given to students who digress too far from the program.

M.S. Thesis Requirement

- A requirement of the M.S. degree is the completion of an approved thesis that demonstrates the student's ability to perform original, independent research.
- Students must find a thesis adviser, who approves the topic and form of the thesis. Students must nominate a thesis committee consisting of the adviser and at least two other faculty members who are eligible to serve on thesis committees, and the committee must be appointed by the Graduate Division.
- The final thesis must be approved by the thesis committee.

M.S. Thesis Committee

- The Master's Thesis committee consists of a minimum of three UCLA faculty members.
- The chair and at least one other faculty member must hold a professorial appointment in the Department of Statistics & Data Science
- Additional faculty members, including those with the title of Lecturer may be appointed to the committee and/or serve as Co-Chairs

General Degree Process for MS Thesis

1. Start thinking about who you would like as your faculty advisor during your first year. Faculty contact information can be found on the website.

2. Submit your **"Nomination of Master's Thesis Committee"** form to the Stats Graduate Advisor, 4-8 weeks prior to submitting the "Master's Advancement to Candidacy Petition" form.

3. Submit the **"Master's Advancement to Candidacy Petition"** form along with a copy of your unofficial transcripts to the Stats Graduate Advisor**, within the first two weeks** of the quarter you want to graduate.

4. **File** thesis. Committee members will approve your thesis online.

Graduate Level Core Courses

FALL
200A Applied Probability | **201A** Research Design, Sampling, & Analysis |
202A Statistics Programming

WINTER
200B Theoretical Statistics | **201B** Statistics Modeling & Learning |
202B Matrix Algebra & Optimization

SPRING
200C High Dimensional Statistics | **201C** Advanced Modeling & Inference |
202C Monte Carlo Methods for Optimization

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Official links

- The **official** graduate division webpages:

https://grad.ucla.edu/programs/physical-sciences/statistics-department/statistics/

- The departmental webpages, contain more information:

https://statistics.ucla.edu/index.php/academics/graduate/ms-program/

https://statistics.ucla.edu/index.php/academics/graduate/ph-d-program/

General Rules

- Every student must be registered for at least 12 units each academic quarter. Also can include 500-level courses.
- You need to be registered for classes or on filing fee if you request a degree or file your thesis/dissertation.
- When in doubt, review the Standards and Procedures and/or email me at jose.salas@stat.ucla.edu

Academic Student Employee(ASE) Positions

- Graduate Student Researcher (GSR)
  - Must be enrolled in 12 units
  - Must have a 3.0 or higher
  - Hired by a PI (Faculty Advisor)
  - NRST (Nonresident Supplemental Tuition) can be waived if over 45%
- Reader Positions (graders)
  - Must be enrolled in 12 units
  - Must have a 3.0 or higher
- Teaching Assistant (TA)
  - Must be enrolled in 12 units
  - Must have a 3.0 or higher
  - Only Fall, Winter, and Spring
  - Hired to perform teaching duties
  - **Must enroll in Stats 495A if you want to TA in the future. Only offered in the Fall.**

Fee Remissions

- What Are Fee Remissions?
  - Fee Remissions are benefits paid for by the hiring department to cover partial graduate tuition and fees.
  - Graduate Student Fee Remissions Rates can be found here.
- Eligibility?
  - Appointments must be at least 25% time, not to exceed 50% time.
  - Student must at work at least 25% time during the term.
  - Student must register and enroll in a minimum of 12 units
  - Cumulative GPA must be 3.0 or better.
  - Please see the Academic Apprentice Personnel Manual for more information.

More Important Websites

https://grad.ucla.edu/academics/

https://grad.ucla.edu/funding/financial-aid/