



**USC Dornsife**  
*Department of Mathematics*

***Master's Student  
Handbook***  
2024-2025

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## ACADEMIC ADVISEMENT

For any questions about degree requirements or navigating the graduate experience, please contact **Susan Sath Vaswani**, Staff Graduate Advisor (SGA) in USC's Department of Mathematics. Students can reach Susan via:

- Email: [sath@usc.edu](mailto:sath@usc.edu)
- In person: KAP 104
- Zoom Phone: 213-740-1735

Please start inquiries with the SGA. Occasionally, student inquiries will require advisement or approval from the academic program directors:

### **Professor Sami Assaf**

*Director of Graduate Studies  
Program Director, Mathematics M.A.*

### **Professor Sergey Lototsky**

*Program Director, Applied Mathematics M.A. and M.S.*

### **Professor Jin Ma**

*Program Director, Mathematical Finance M.S.*

### **Professor Stanislav Minsker**

*Program Director, Statistics M.S.*

## DEGREE REQUIREMENTS

### **M.A. in Mathematics**

**24 units total required, including:**

*Required Courses (12 units)*

Math 510a - Algebra

Math 525a – Real Analysis

*One Option from A, B, or C:*

(A) Math 535a and Math 540 – Differential Geometry and Topology

(B) Math 555a and Math 565a – Partial Differential Equations and Ordinary Differential Equations

(C) Math 505a and Math 541a – Applied Probability and Introduction to Mathematical Statistics

Remaining units to reach 24 units total can be any Math 500-level course. Students must also pass graduate exams at the Master's level or higher. Exam requirements are outlined on page 6.

## M.A. in Applied Mathematics

### **24 units total required, including:**

Math 525a – Real Analysis (3 units)

*At least three courses from this list (9 units)*

Math 502a – Numerical Analysis

Math 502b – Numerical Analysis

Math 505a – Applied Probability

Math 505b – Applied Probability

Math 541a – Introduction to Mathematical Statistics

Math 541b – Introduction to Mathematical Statistics

Math 555a – Partial Differential Equations

Math 565a – Ordinary Differential Equations

Remaining units to reach 24 units total can be any Math 500-level course. Other courses with significant applications of Math may be approved by the program director. Please email the SGA ([sath@usc.edu](mailto:sath@usc.edu)) to receive a list of non-Math electives that are already approved.

Students must also pass graduate exams at the Master's level or higher. Exam requirements are outlined on page 6.

## M.S. in Applied Mathematics

### **30 units of total required, including:**

*Required Courses (15 units)*

Math 501 – Numerical Analysis and Computation

Math 505a – Applied Probability

Math 505b – Applied Probability

Math 525a – Real Analysis

Math 541a – Introduction to Mathematical Statistics

Remaining units to reach 30 units total can be any Math 500-level course. Other courses with significant applications of Math may be approved by the program director. Please email the SGA ([sath@usc.edu](mailto:sath@usc.edu)) to receive a list of non-Math electives that are already approved.

To complete the degree, students must choose one of the following options:

1. Complete a thesis, which requires registration in Math 594a and Math 594b.
2. Pass exams at the Master's level or higher. Exam requirements are outlined on page 6.

## M.S. in Mathematical Finance

### 31 units total required, including:

#### *Mathematics and Mathematical Finance (10 units)*

Math 530a – Stochastic Calculus and Mathematical Finance

Math 530b – Stochastic Calculus and Mathematical Finance

Math 512 – Financial Informatics and Simulation

Math 590 – Directed Research

#### *Financial Economics and Econometrics (8 units)*

Econ 515 – Time Series Analysis

Econ 577 – Economics of Financial Markets

#### *Electives from the following categories (4 courses, 13-14 units)*

1. Computational and Empirical Finance (must take 1 course)
2. Statistics or Numerical/Optimization/Other Methods (must take 1 course)
3. Financial Economics (must take 1 course)
4. The 4th elective can be chosen from any of the three categories, or can be another course in the FBE, ECON, or MATH department, subject to the approval of the program directors.

Please visit the [Mathematical Finance program's website](#) for a list of elective options.

## M.S. in Statistics

### 30 units total required, including:

#### *Required Courses (9 units)*

Math 541a – Introduction to Mathematical Statistics

Math 541b – Introduction to Mathematical Statistics

Math 550- Statistical Consulting and Data Analysis

#### *One course from each of options A, B, C (9 units):*

(A) Math 505a (Applied Probability) or Math 507a (Theory of Probability)

(B) Math 542 (Analysis Variance and Design) or Math 545 (Introduction to Time Series)

(C) Math 501 (Numerical Analysis and Computation), Math 502a (Numerical Analysis) or PM 511aL (Data Analysis)

#### *Plus at least 12 units of statistical applications from the following categories:*

Computer Science

Data Sciences and Operations

Economics

Electrical and Computer Engineering

Finance and Business Economics

Industrial and Systems Engineering

Data Science

Mathematics

Preventative Medicine

Psychology

Public Planning and Development

Social Work

Sociology

\*The following courses may not be used as electives for the degree: DSO 401, DSO 510, EE 503, FBE 529, FBE 540, FBE 543, MATH 505a and MATH 505b or MATH 507a and MATH 507b (other than the course used to satisfy Requirement A), MATH 525a and MATH 525b, MATH 532, MATH 574, PPD 502x, PPD 525 and PPD 570.

To complete the degree, students must choose one of the following options:

1. Complete a thesis, which requires registration in Math 594a and Math 594b.
2. Pass exams at the Master's level or higher. Exam requirements are outlined on page 6.

## Graduate Exams

The Math Department offers written exams covering core mathematics content. These exams are offered twice a year before the start of the fall and spring semesters (Week 0). Please review specific exams required for programs below:

Program	Exam Requirement
M.A. in Mathematics	<p>Students must pass, at the master's level or higher, two written exams.</p> <p>One option must be chosen from:</p> <ul style="list-style-type: none"> <li>• Algebra (510a + 510b)</li> <li>• Analysis (525a)</li> </ul> <p>The second exam must be chosen from the following:</p> <ul style="list-style-type: none"> <li>• Topology (540)</li> <li>• Partial Differential Equations (555a)</li> <li>• Probability (505a)</li> </ul>
M.A. in Applied Mathematics	<p>Must pass, at the master's level or higher, two exams:</p> <ol style="list-style-type: none"> <li>1. Analysis (525a)</li> <li>2. Probability (505a) or Partial Differential Equations (555a)</li> </ol>
M.S. in Applied Mathematics	<p>Must pass, at the master's level or higher, the Analysis exam (525a) Probability exam (505a).</p>
M.S. in Statistics	<p>Must pass, at the master's level or higher, the Probability exam (505a).</p>

Students will receive emails with information on how to sign up to take the exam. It's strongly recommended to take the exam right after completing the course. For example, those who complete Real Analysis in Fall 2024 should take the exam at the beginning of the Spring 2025 semester.

# Master's Thesis

Students who opt to complete the degree with a thesis must follow [USC's Thesis Submission Guidelines](#).

A master's thesis does not have to contain original or new research topics. It is usually an exposition of a topic, expressed clearly, with some new examples if possible. Below is a general timeline and checklist to help students prepare for the thesis:

1. Review the [research areas in the Math Department](#) and the faculty members listed in those areas. Identify the research topics of interest.
2. Contact the faculty member with expertise in the research topic to ask if they can be your thesis advisor.
  - a. Professors may decline requests, so this step may need to be repeated until a professor approves.
  - b. It will be helpful to approach the professor with specific ideas about the thesis topic and what you intend to explore.
  - c. Students can work with multiple professors, but only one must be designated as the Chair on the [Appointment of Master's Committee form](#).
3. After confirming who the thesis advisor will be, email the SGA ([sath@usc.edu](mailto:sath@usc.edu)), who will then provide D-clearance to register in **Math 594a** (one semester).
4. Find at least two other professors who will agree to be part of the [Master's Thesis Committee](#). Professors can be outside of the Math department, but the majority of members in the committee must be from the Math department.
5. Enroll in **Math 594b** (one semester) after completing Math 594a. Students have two semesters to write and submit the thesis. During this period, students should have consistent communication with their thesis advisor (Committee Chair) and other committee members. They can offer guidance on research papers to read and reference, suggest edits for what the writing should focus on, etc. If the thesis cannot be completed in two semesters, students must register in **Math 594z** for each fall and spring semester until the thesis is submitted.
6. When students are ready to submit their thesis, [follow the 7 steps listed on the Thesis Center website](#).
  - a. For Step 1, email the SGA the list of committee members' names and USC emails. The SGA will then initiate a docusign to obtain all signatures required on the form.
  - b. For Step 3, send the manuscript to the committee to read instead of presenting a defense. Make any edits required by the committee before they approve it for submission.

# COURSE REGISTRATION

Students will receive emails when the registration period opens. It is the student's responsibility to register for courses or drop any courses by university deadlines. A complete list of registration deadlines is included on the [Schedule of Classes](#) (click on the semester, then click "Registration Calendar").

All registration is done via USC's Web Registration system, which can be accessed via the "[myUSC](#)" portal. To learn how to use the Web Registration system, please watch [video tutorials](#) provided by USC.

## D-Clearance

Students cannot register in courses with the letter "D" at the end of the section number until they receive Departmental Clearance (or D-clearance). If it's a Math course, email the SGA ([sath@usc.edu](mailto:sath@usc.edu)) to request D-clearance. If the course is from a different department (Economics, Finance, Engineering, etc.), students will need to request D-clearance from the academic department offering the course. Keep in mind that departments may not give D-clearance due to capacity issues, so please have an alternative course in mind.

## Prerequisite Waivers

If a course lists a prerequisite in the schedule of classes, students will not be able to register in the class until A) the prerequisite course is taken first at USC, or B) students request the department to waive the prerequisite.

For Math courses, please email the SGA ([sath@usc.edu](mailto:sath@usc.edu)) to request a prerequisite waiver. Courses that list a 500-level Math course as the prerequisite will require instructor approval. If the course is from a different department (Economics, Finance, Engineering, etc.), students will need to request a prerequisite waiver from the academic department offering the course.

Courses with prerequisites must be taken in the correct sequence. **Students will receive 0 units of credit for courses taken out of sequence.** For example, if a student got instructor approval to waive Math 541b's prerequisite (541a), they will get 0 credits for Math 541a if they complete 541a after 541b.



# UNIVERSITY POLICIES YOU NEED TO KNOW

A complete record of university policies can be found in [USC's Catalogue](#). This handbook highlights a few policies we recommend reviewing every semester.

## Academic Standards

At no time should the overall GPA drop below 3.0. A minimum grade of C (2.0) is required in a course to receive graduate credit. Work graded C- or below is not acceptable for subject or unit credit toward any master's program. An overall GPA of at least 3.0 on all units attempted at USC is required for graduation.

If a student's overall GPA drops below 3.0, they will be contacted by the Math department to discuss an academic plan moving forward. Failure to meet the expectations outlined in the plan may result in dismissal.

## Continuous Enrollment and Leave of Absences

Students admitted to a graduate degree program are required to be enrolled at USC for fall and spring semesters each year until all degree requirements have been satisfactorily completed within the time limit. Graduate students who fail to register in a fall or spring semester are no longer considered to be enrolled in a graduate degree program. After an unauthorized absence, formal readmission is required.

Students who have been granted a leave of absence do not need to apply for readmission when they return from the approved leave. Students must request a leave of absence by the last day to drop or add courses. The request should include a plan for academic progress upon return. If granted, the period of leave is not counted in the time allowed for the completion of degree requirements. A leave of absence may be allowed for one semester at a time, up to a maximum of four semesters. International students considering a leave of absence should be aware of their visa status implications. For more information, contact [USC's Office of International Services](#).

A master's candidate who is writing a thesis and has completed all course work for the degree must enroll in the appropriate thesis registration (Math 594) until the thesis has been approved. Please note that some courses with no academic credit require payment of tuition. Most classes with course numbers ending in z (e.g., 594z) require payment of 2 units of tuition.

## For International Students

International students should contact [USC's Office of International Services](#) on all matters related to their international status. Important reminders:

New incoming international students must complete [Immigration Status Verification](#) before they can register for classes.

To maintain their visa status, international students must be registered for a full course of study in classes that meet their degree requirements during the fall and spring semesters. A full course of study for Master's students is 8 units or more. In certain situations, students can apply for a [Reduced Course Load \(RCL\)](#) and register in fewer than 8 units if the RCL application is approved.

International students must be aware of the expiration date on their I-20/DS-2019. If students cannot complete their degree by the expiration date on their I-20/DS-2019, students must request a [program extension](#) before the expiration date on the I-20/DS-2019. Students who do not file a program extension on time will be considered out of status. Passports must be valid at all times. If the passport will expire soon, students must renew it through the embassy or consulate of their home country.

## CAMPUS RESOURCES

### Career Services

- [USC Career Center](#)

### Student Organizations

- [Mathematics Graduate Student Association](#)
- [USC Women in Math: Charlotte's Web](#)
- [List of all student clubs on campus](#)

### Student Wellness

- [Recreational activities](#)
- [Counseling services and crisis intervention](#)
- [Trojans Care 4 Trojans](#)
- [Office of Religious Life](#)
- [Office of Student Accessibility Services](#)
- [USC LGBTQ+ Center](#)