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|  | **Master’s Student Handbook**2023-2024 |
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### ACADEMIC ADVISEMENT

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

* Email: sath@usc.edu
* In person: KAP 104
* Zoom Phone: 213-740-1735

Please start inquiries with Susan Sath. 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

Refer to the program’s catalogue (linked below) for the full list of degree requirements:

[M.A. in Mathematics](https://catalogue.usc.edu/preview_program.php?catoid=16&poid=21070&returnto=6360)

**24 units total required, including:**

*Required Courses (15 units)*

Math 510a - Algebra
Math 510b - Algebra
Math 520 – Complex Analysis
Math 525a – Real Analysis

*One Option from A, B, C, or D (6 units):*

1. Math 535a and Math 540 – Differential Geometry and Topology
2. Math 555a and Math 565a – Partial Differential Equations and Ordinary Differential Equations
3. Math 507a and Math 541b – Theory of Probability and Introduction to Mathematical Statistics
4. Math 502a and Math 502b – Numerical Analysis

Remaining units to reach 24 units total can be any Math 500-level course. Completion of a master’s thesis OR passing graduate exams is also required.

[M.A. in Applied Mathematics](https://catalogue.usc.edu/preview_program.php?catoid=16&poid=21070&returnto=6360)

**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 or Math 507a – Theory of Probability

Math 505b – Applied Probability or Math 506 – Stochastic Processes or Math 507b – Theory of Probability

Math 541a – Introduction to Mathematical Statistics

Math 54ab – 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 or electives\* chosen from:

CSCI: 567, 570, 670, 672;

ECON: 613, 614, 652, 659, 691;

EE: 512, 518, 556, 561;

FBE: 535, 554, 555, 559, 589;

INF: 552, 553; ISE: 535, 631, 632, 670

\*Other courses with significant applications of Math may be approved by program director.

Completion of a master’s thesis OR passing graduate exams is also required.

[M.S. in Applied Mathematics](https://catalogue.usc.edu/preview_program.php?catoid=16&poid=21067&returnto=6360)

**30 units total required, including:**

*Required Courses (15 units)*

Math 501 – Numerical Analysis and Computation

Math 505a – Applied Probability

Math 505b – Applied Probability

Math 541a – Introduction to Mathematical Statistics

Math 570a – Methods of Applied Mathematics

Remaining units to reach 30 units total can be any Math 500-level course or electives\* chosen from:

CSCI: 567, 570, 670, 672;

ECON: 613, 614, 652, 659, 691;

EE: 512, 518, 556, 561;

FBE: 535, 554, 555, 559, 589;

INF: 552, 553; ISE: 535, 631, 632, 670

\*Other courses with significant applications of Math may be approved by program director.

Completion of a master’s thesis is also required.

[M.S. in Mathematical Finance](https://dornsife.usc.edu/mathematical-finance/degree-requirements/)

**30 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 659 – Economics of Financial Markets

*Electives from the following categories (4 courses, 12 units)*

* Computational and Empirical Finance (must take 2 courses)
* Statistics or Numerical/Optimization/Other Methods (must take 1 course)
* Financial Economics (must take 1 course)

[M.S. in Statistics](https://catalogue.usc.edu/preview_program.php?catoid=16&poid=21068&returnto=6360)

**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):*

1. Math 505a – Applied Probability or Math 507a – Theory of Probability
2. Math 542 – Analysis Variance and Design or Math 545 – Introduction to Time Series
3. Math 501 – Numerical Analysis and Computation, or 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

### Graduate Exams

If students opt to pass graduate exams to fulfill their degree requirements (if applicable), refer

to the policies below:

|  |  |
| --- | --- |
| **Program** | **Exam Requirement** |
| M.A. in Mathematics | Must pass one option chosen from:* Algebra (one exam that covers 510a and 510b)
* Analysis (two exams; one covers Math 525a + one covers Math 520)

Must pass two exams chosen from one of the four combinations below:* Differential Equations (565a & 555a)
* Geometry/Topology (535a & 540)
* Numerical Analysis (502a & 502b)
* Probability/Statistics (507a & 541b)
 |
| M.A. in Applied Mathematics | Must pass the Real Analysis (525a) exam and another exam chosen from:* Numerical Analysis (502a or 502b)
* Statistics (541a or 541b)
* Partial Differential Equations (555a)
* Ordinary Differential Equations (565a)
* Applied Probability (505a)
* Probability (507a)
 |
| M.S. in Statistics | Must pass the following three exams:* Math 541a
* Math 541b
* Math 505a or 507a
 |

Graduate exams will be given at the beginning (or Week 0) of the fall and spring semesters. 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 2023 should take the exam at the beginning of the Spring 2024 semester.

### Master’s Thesis

Students who opt to complete the degree with a thesis (required for the M.S. in Applied Mathematics)

must follow [USC’s Thesis Submission Guidelines](https://graduateschool.usc.edu/current-students/thesis-dissertation-submission/).

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](https://dornsife.usc.edu/mathematics/research/) 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 the

thesis advisor.

* 1. Professors may decline requests, so this step may need to be repeated until a professor approves.
	2. It will be helpful to approach the professor with specific ideas about the thesis topic

and what students intend to explore.

* 1. Students can work with multiple professors, but only one must be designated as the Chair on the [Appointment of Master’s Committee form](https://graduateschool.usc.edu/wp-content/uploads/2020/12/Appointment_Change_of_Masters_Committee.pdf).
1. After confirming who the thesis advisor will be, email Susan Sath (sath@usc.edu). Susan

will then provide clearance to register in **Math 594a** (one semester).

1. Find at least two other professors who will agree to be part of the [Master’s Thesis Committee](https://graduateschool.usc.edu/wp-content/uploads/2020/12/Appointment_Change_of_Masters_Committee.pdf). Professors can be outside of the Math department, but the majority of members in the committee must be from the Math department.
2. 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.
3. When students are ready to submit their thesis, [follow the 7 steps listed on the Thesis Center website](https://graduateschool.usc.edu/current-students/thesis-dissertation-submission/guidelines-to-submission/).
	1. For Step 1, Susan Sath can help obtain signatures from the Program Director and Dean after students obtain signatures from their committee members.
	2. For Step 3, send the manuscript to the committee to read instead of 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](https://classes.usc.edu/term-20233/classes/math/) (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](https://my.usc.edu/)” portal. To learn how to use the Web Registration system, please watch [video tutorials](https://arr.usc.edu/registration-counseling/registration/web-registration/) 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 Susan Sath (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 Susan Sath (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 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](https://catalogue.usc.edu/). 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](https://ois.usc.edu/students/maintainingstudentstatus/leaveofabsence/)

[Services.](https://ois.usc.edu/students/maintainingstudentstatus/leaveofabsence/)

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](https://ois.usc.edu/) on all matters

related to their international status. Important reminders:

New incoming international students must complete [Immigration Status Verification](https://ois.usc.edu/new-students/firstweeks/immigration-status-verification-isv/) 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)](https://ois.usc.edu/students/maintainingstudentstatus/reducedcourseload/) 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](https://ois.usc.edu/students/maintainingstudentstatus/programextension/) 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](https://careers.usc.edu/)

**Student Organizations**

* [Mathematics Graduate Student Association](https://dornsife.usc.edu/mgsa/)
* [USC Women in Math: Charlotte’s Web](https://dornsife.usc.edu/mathematics/usc-women-in-math/)
* [List of all student clubs on campus](https://engage.usc.edu/club_signup)

**Student Wellness**

* [Recreational activities](https://recsports.usc.edu/)
* [Counseling services and crisis intervention](https://safety.usc.edu/resources/counseling/)
* [Trojans Care 4 Trojans](https://campussupport.usc.edu/trojans-care-4-trojans/)
* [Office of Religious Life](https://orsl.usc.edu/)
* [Office of Student Accessibility Services](https://osas.usc.edu/)
* [USC LGBTQ+ Center](https://lgbtqplus.usc.edu/)