Graduate Student Handbook

Department of Mathematics
University of Missouri

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1. PhD Program Requirements

1.1 The milestones of the PhD program

Students pursuing a PhD in Mathematics typically complete the degree requirements within 4 to 6 years, with an average duration of approximately 5 years. Finishing within five years should be the primary goal, as tuition waivers are only available for up to five years (for students admitted with a relevant Master's degree).

The milestones of the program are as follows (see below for further details):

1st Stage [Years 1–2]

1. Complete foundational and pre-qual core courses (Levels 0 and 1 courses).
2. Pass the Algebra and Analysis Qualifying Exams and complete the D1 form.
    - Students with a Master's degree have two years to pass the qualifying exams.
    - Students without a Master's degree have three years to pass the qualifying exams.
3. After passing the qualifying exams, begin exploring research topics and potential advisors.
4. Begin taking post-qualifying courses (Level 2 courses) as part of the program's requirement to complete a minimum of six such courses.

2nd Stage [Year 3]

1. Finalize the qualifying exams (if needed) and submit the D1 form.
2. Finalize the selection of an advisor(s) and research topic.
3. Develop your Plan of Study and submit the D2 form along with the list of courses.
4. Complete at least six post-qualifying courses and fulfill other course requirements.

3rd Stage [Years 4–5]

1. Transition to ``full-time" research.
2. Pass the Comprehensive Exam.
3. Submit the D3 form.

4. Focus on research and writing papers.
5. THE FINAL EXAM: Defend your dissertation.
6. Submit the D4 form and all other required graduation materials, including your dissertation, and graduate. Congratulations!

1.2 Course Requirements

The doctoral plan of study must include a minimum of 72 credit hours from graduate coursework completed at MU, transfer credits, and research hours. Every math Ph.D. student is required to complete **at least six** post-qualifying core courses (**Level 2 courses**). A minimum of 15 credit hours of 8000/9000-level coursework must be completed at MU, excluding problems, readings, and research.

The enrollment requirements for PhD students who have passed their comprehensive exams are described below, in section 1.5.5. In all other cases, the general policy is that graduate students are required to be enrolled for 9 credit hours as full-time students during the Fall and Spring semesters.

Any exemptions to the full-time enrollment requirement must be approved in advance by both the student's advisor and the Director of Graduate Studies.

The most common class of exemptions is for PhD students who have passed the Qualifying Exams and completed at least six post-qualifying courses and are preparing for the Comprehensive Exams. They may request to enroll in 6 credit hours instead of 9.

Failure to obtain prior approval for a reduced course load may result in the loss of the student's tuition waiver by the Graduate School. Additionally, part-time status may impact the terms of certain contracts outside the University, including student loans, insurance policies, and visas.

The Pre-Qual and Post-Qual core courses are listed in the tables below.

Level 0 Courses (Pre-Qual)

Fall	**Spring**
Advanced Calculus of One Real Variable (Math 7700)	Advanced Multivariable Calculus (Math 7900)
Topology (Math 8655)	Complex Variables (Math 7940)
Abstract Algebra (Math 7720)	Advanced Linear Algebra (Math 7920)

Level 1 Courses (Pre-Qual)

Fall	**Spring**
Real Analysis I (Math 8420)	Real Analysis II (Math 8421)
Algebra I (Math 8410)	Algebra II (Math 8411)
Complex Analysis (Math 8425)	Differentiable Manifolds (Math 8430)

In the table below, the parity is determined by the beginning of the academic year. For example, Spring 2026 occurs in the academic year **2025**-2026, therefore would be considered an odd year.

Level 2 Courses (Post-Qual)

Fall - Even Year	**Spring - Even Year**	**Fall - Odd Year**	**Spring - Odd Year**
Harmonic Analysis I (Math 8630)	Harmonic Analysis II (Math 8631)	Harmonic Analysis I (Math 8630)	Harmonic Analysis II (Math 8631)
PDE I (Math 8445)	Theory of Distributions (Math 8302.1)	PDE I (Math 8445)	PDE II (Math 8446)
ODE (Math 8440)	Probability (Math 8480)	ODE (Math 8440)	Probability (Math 8480)
Algebraic Number Theory (Math 8521)	Differential Geometry (Math 8650)	Analytic Number Theory (Math 8520)	Algebraic Topology (Math 8618)

Commutative Algebra I (8510)	Commutative Algebra II (8511)	Algebraic Geometry I (8615)	Algebraic Geometry II (8616)
Functional Analysis (8628)	Mathematical Physics (8402.1)		

1.3 Qualifying Exams

The qualifying exams consist of two written components: an **Algebra Examination** and an **Analysis Examination**. Students must pass both components to successfully complete the qualifying exams.

- **Exam Content**:
  - The Algebra exam is based on the **Year 1 Algebra sequence: Math 8410–8411.**
  - The Analysis exam is based on the **Year 1 Analysis sequence: Math 8420–8421.**
    For sample questions, students should contact the instructors of these courses.
- **Exam Schedule**:
  Both exams are offered twice a year:
  - In **May**, shortly after the Spring Semester concludes.
  - In **August**, just before the start of the Fall Semester (for retakes).
- **Eligibility Requirements**:
  - Students with a **master's degree in mathematics** have two academic years from the date of admission to the graduate program to pass both components.
  - Students without a **master's degree in mathematics** have three academic years to pass both components.
  - Exceptions may be granted with the recommendation of the Director of Graduate Studies and approval from a majority of the Doctoral Faculty. If a student is granted a one-year extension and does not pass the exam during the May session of the extended year, they will still have a final opportunity to pass the exam in the August session of that year. However, students who pass the qualifying exam in August, after failing in May, may not be eligible for a Teaching Assistantship for the following academic year.

1.4 PhD Advisor and Plan of Study

By the time a PhD student has passed their qualifying exams (or shortly thereafter), they should have identified a research advisor. In consultation with the PhD advisor, the student must select three additional graduate faculty members to form their doctoral committee. Three members of the committee must be from the Mathematics Department, while the fourth member may be from either the Mathematics Department or from another academic department at MU. At least two members of the committee, including the student's advisor, must be MU doctoral faculty.

The doctoral committee serves to advise the student on their research and dissertation preparation and to ensure that the doctoral dissertation meets high academic standards. To enable the committee to effectively fulfill its advisory and oversight roles, students are expected to meet with their committee members regularly, at least once per year.

The Plan of Study (D2 form) outlines the courses the student has taken or plans to take. The Plan of Study should encompass coursework that: (1) Fulfills the program's requirements; and (2) Prepares the student for their envisioned future career or academic path.

1.5 Doctoral Comprehensive Examination

The comprehensive examination consists of a **written section** and an **oral section**. It must be completed at least seven months before the defense of the dissertation. The two sections of the examination must be completed within one month. The student must be enrolled to take this examination.

A doctoral student must successfully complete the comprehensive examination within a period of five years beginning with the first semester of enrollment as a PhD student.

1.5.1 Written Exam

The written section of the examination is organized and overseen by the major advisor and proceeds as follows:

Three members of the Math Department's Doctoral Program Committee independently work with the student to identify specific topics for study. These topics might include an influential research paper or theorems from a book at the

level of an Advanced Graduate class, and the student typically spends a few months preparing.

Once the student has completed their preparation, they notify their major advisor that they are ready to receive the written questions. At this point, the major advisor requests the questions from the three committee members, who each submit their questions. The advisor compiles these into a single document containing a total of nine written questions and provides the document to the student.

The student is then given two weeks to complete the written exam and submit their written responses to the committee for evaluation. To advance to the oral examination, the student must receive no more than one vote of “fail” or “abstain” from the committee.

1.5.2 Oral Exam

After successfully completing the written exam, the oral exam must take place within one month of the written exam's submission. ***The oral exam*** serves as a defense of the written exam and ***involves the participation of the entire committee*** (all four members of the committee must be present for the oral exam).

1.5.3 Successful Completion

To successfully complete the comprehensive examination, the doctoral advisory committee must vote to pass the student on the entire examination—both the written and oral sections—with no more than one dissenting or abstaining vote.

A report of this decision, documented on the Doctoral Comprehensive Examination Results form (D3) and signed by all committee members, must be submitted to the Graduate School and provided to the student ***no later than two weeks after the comprehensive examination is completed***.

1.5.4 Failure

Failure of either the written or oral section of the exam constitutes failure of the comprehensive examination. If a failure is reported, the committee must include an outline of the general weaknesses or deficiencies in the student’s work as part of the report. This report must also be submitted to the Graduate School.

A student who fails the comprehensive examination may not retake it for at least 12 weeks. Failure to pass the examination on the second attempt automatically disqualifies the student from candidacy.

1.5.5 Continuous Enrollment After the Exam

Students must maintain continuous-enrollment status during their doctoral candidacy. Continuous enrollment status as a doctoral candidate begins at the onset of the term immediately following successful completion of the comprehensive examination. To maintain continuous enrollment, students must register for at least 2 hours during the Spring and Fall semesters and 1 hour during the Summer semester. Failure to maintain continuous enrollment results in the termination of candidacy.

1.6 Doctoral Dissertation

The dissertation process involves several key steps to ensure that doctoral candidates meet the necessary academic and procedural requirements. A dissertation must be written on a subject approved by the candidate's program committee. The dissertation must include the results of original and significant investigation, and must be the candidate's own work, and it cannot be coauthored. The dissertation can only be defended when MU is officially in session.

Throughout the process, candidates must maintain continuous enrollment to defend their dissertation. This entails enrolling in two credit hours each Fall and Spring semester and one credit hour during summer sessions, typically through Dissertation Research (Math 9090). Failure to maintain continuous enrollment results in the termination of candidacy.

All dissertation defenses are open to the general faculty and graduate students. Dissertation defense dates should be publicly announced in advance. The Graduate School allows flexibility in the defense format, permitting both in-person and virtual defenses, though candidates should confirm any specific restrictions with the Mathematics Department.

Upon successfully defending the dissertation, the candidate must submit a Report of the Dissertation Defense (D4) form and a signed approval page to the Graduate School by the deadline. To pass, the doctoral committee must approve the written dissertation and the defense, with no more than one member dissenting or abstaining. If corrections or adjustments are required, the candidate has one

additional semester to complete them before final approval is granted. Graduation is deferred until all requirements, including submitting the D4 form, the approved dissertation, and the approval page, are met.

The final dissertation must be submitted in PDF format with appropriate margins and formatting. Submissions are typically made through Canvas. Supplemental documents, including a signed approval page and an electronic release form, must accompany the dissertation. For detailed instructions, candidates should refer to the Graduate School's Thesis and Dissertation Guidelines and adhere to all graduation and commencement deadlines.

1.7 Graduate School Forms

After passing the Qualifying Exams, students should begin submitting the necessary degree program forms to help the Mathematics Department and the Graduate School track progress toward degree completion. These forms include:

- D1 Form**: Qualifying Examination Results & Doctoral Committee Approval**
  This form verifies the results of the qualifying process and confirms the student's adviser and doctoral committee.
- D2 Form**: Plan of Study for the Doctoral Degree**
  This form outlines the coursework to be included in the student's program of study.
- D3 Form**: Doctoral Comprehensive Examination Results**
  This form records the official results of the doctoral comprehensive examination.
- D4 Form**: Report of the Dissertation Defense** and the Approval Page
  This form reports the official results of the dissertation defense.
- This form is to be used to change advisors, academic programs, or add a Master's degree to a PhD track.
- Change of Committee form.

For a complete list of required forms, click here.

2. Master's Program Requirements

Students pursuing a Master's degree in Mathematics typically complete the program requirements within 2 to 3 years. The program consists of two main stages:

Stage 1 [Years 1–2]
During the first stage, students focus on fulfilling their course requirements. After successfully completing at least one semester, the student works with their advisor to complete the M1 form, which outlines their planned program of study.

Stage 2 [Year 2]
In the second stage, students finalize their course requirements, defend their Master's Project **(**Math 8190**)** or Master's Thesis **(**Math 8090**),** and submit the M3 form to document the successful completion of this requirement. For students pursuing the Master's Thesis option, the completion of the M2 form is also required.

2.1 MA in Mathematics

The MA Degree Program of Study requires 30 hours of approved coursework, with at least 18 of those hours at the 8000 level. The program includes the following required courses:

- Math 8420: Theory of Functions of Real Variables I
- Math 8410: Algebra I
- Either Math 8190 (Master's Project) or Math 8090 (Master's Thesis)

Students must address any deficiencies in their undergraduate training, particularly in advanced calculus and abstract algebra. Certain courses, specifically Math 7100, 7110, 7140, and 7510, may not be included in the program of study.

The Master's Project or Thesis must be evaluated and approved by a Master's Committee, consisting of three members of the Mathematics regular faculty.

2.2 MS in Applied Mathematics

The MS in Applied Mathematics Degree Program of Study also requires 30 hours of approved coursework, with at least 15 hours at the 8000 level. The program includes the following required courses:

- Math 8420: Theory of Functions of Real Variables I
- Math 8440: Theory of Differential Equations I
- Either Math 8190 (Master's Project) or Math 8090 (Master's Thesis)

Additional suggested courses include:

- Math 8445: Advanced Topics in Differential Equations
- Math 8480: Mathematical Modeling

At least three credit hours must be completed outside the Mathematics Department. Other requirements (some of which may have been met during undergraduate studies) include:

- One year of advanced calculus
- At least one approved course in each of the following areas:
    - Linear Algebra
    - Numerical Analysis
    - Mathematical Statistics or Probability

As with the MA program, students may not include Math 7100, 7110, 7140, and 7510 in their program of study. The successful completion of a Master's Project or Thesis must also be certified by a Master's Committee composed of three regular Mathematics faculty members.

3. Teaching Assistantships

The Mathematics Department offers Teaching Assistantships to qualified graduate students. Teaching Assistants are employed at a 0.50 FTE (full-time equivalent), which corresponds to approximately 20 hours of work per week during a semester. The remaining time is dedicated to the students' studies and research.

Our Teaching Assistants typically teach under the supervision of a faculty member, such as a course coordinator or instructor.

- During their first year, Teaching Assistants will not be responsible for teaching their own course. Instead, they will assist course coordinators with teaching activities, including holding office hours, grading, and proctoring exams and quizzes. Additionally, all first-year Teaching Assistants are

required to participate in a mandatory year-long teaching seminar designed to help them develop their instructional skills.
- For teaching assistants in their second year and beyond, the responsibilities include teaching six contact hours or the equivalent per week during each semester, preparing exams, quizzes, and class materials, grading assignments and exams, maintaining weekly office hours, and attending course organizational meetings.

All Teaching Assistants are required to adhere to the course-specific teaching responsibilities provided to them by the course coordinators or instructors for the courses they teach. Failure to meet these responsibilities constitutes a breach of contract and may result in the termination of the Teaching Assistantship.

The Associate Chair supervises all Teaching Assistants and coordinates their performance evaluations each semester. Graduate assistantships are subject to university and departmental funding. Adequate progress toward completing the degree and evidence of satisfactory performance and conduct is required for renewal, in addition to available funding.

4. **Graduate Student Tuition Support: Eligibility and Time Limits Eligibility.**

To qualify for tuition support, graduate teaching and research assistants must generally hold a qualifying assistantship or combination of assistantships/fellowships equivalent to at least .50 FTE, or 20 hours per week**,** and must meet the applicable job-title and academic-standing requirements.

Time limits. Tuition support is subject to the maximum eligibility periods summarized below. Summer semesters are not included in the semester limits.

Student type	Max years	Max semesters (excluding summers)
Admitted as a master's student	3	6
Admitted into a terminal master's degree requiring at least 60 credit hours	4	8
Has relevant master's degree; admitted as doctoral student	5	10
No relevant master's degree; admitted as doctoral student	7	14
No relevant master's degree; admitted to doctoral program with master's en route	8	16

5. AI Use Policy (Graduate Program)

This policy applies to any work submitted to fulfill program requirements. This includes, but is not limited to, homework assignments, quizzes, midterms, finals, qualifying exams, projects and theses, comprehensive exams, and dissertations.

- **Basic rule**. Our graduate program's goal is to build independent mathematical thinking, clear writing, and strong proof skills. Any work you submit to fulfill program requirements must be your own: you must be able to explain it and reproduce it without AI. AI may be used only when the instructor or student's committee explicitly allows it, and even then, it is a tool—not a substitute for your own reasoning. You are responsible for the correctness and originality of what you submit.
- **Coursework and exams**. You may not use AI to write or solve any part of homework, quizzes, projects, midterms, finals, qualifying exams, projects

and theses, or comprehensive exams unless the instructor (or committee) explicitly allows it in advance. If AI is allowed, you must follow the limits set (for example: "editing only"). You must also disclose the use as required.

- **Dissertation**. A dissertation must be the student's own work. AI-material may not appear in the dissertation unless the committee approves it in advance. If AI is approved for the dissertation, the student must include a disclosure statement describing what tool was used and for what purpose.
- **Practical warning**. Use AI for support and exploration—for example, editing grammar or LaTeX, debugging basic code, finding papers to read, or suggesting examples to test a conjecture—not as a source of mathematical truth. Treat AI like a fast but unreliable assistant: it can confidently make things up, including claims, proofs, and references. Even when AI use is approved, students remain responsible for producing their own work. Any submitted work must reflect the student's own understanding, reasoning, and writing, and students should be prepared to explain and defend it without relying on AI.
- **Checks and consequences**. Students are fully responsible for making sure any AI-assisted work follows university and department rules on plagiarism and authorship. If there are questions about whether submitted work reflects the student's own understanding, the instructor or exam committee may require follow-up questions or an oral check. Using AI without permission, or failing to disclose permitted AI use, may be treated as an academic integrity violation and handled under university procedures.
- **Program Committee Review**. Because AI tools are changing quickly, the Graduate Affairs Committee may update this policy to reflect new best practices and ethical standards. Any changes will be communicated to the students clearly and in writing.

6. Standards for Good Standing, Probation, and Dismissal

6.1 Graduate School Grade Requirements

According to Graduate School policies, a student is in good standing if they maintain a cumulative GPA of 3.0 or higher. To earn their degree, students must also maintain a cumulative GPA of 3.0 or higher.

At the end of each semester, students with a cumulative GPA below 3.0 will be placed on probation. If the cumulative GPA reaches 3.0 or higher by the end of the

following semester, the probationary status will be removed. If a student on probation fails to raise their cumulative GPA to 3.0, they may, at the recommendation of the department or program, be allowed a second probationary semester.

A student may be subject to dismissal if they do not raise their cumulative GPA to 3.0 by the end of the second probationary semester or if their GPA falls below 2.0 at any point (note that summer sessions are not counted as a semester).

As another matter of Graduate School policy, students who do not make satisfactory academic progress are not eligible for assistantships.

6.2 Mathematics Department Policies

According to departmental policy, in addition to Graduate School policies, a student is making satisfactory academics progress if they

- maintain a B average *each semester* while enrolled in the required number of credit hours of approved courses
- pass the Qualifying and Comprehensive Exams within the specified time limits, as outlined in the preceding sections
- as candidates, demonstrate measurable progress in their research and thesis development, shown through regular, substantive meetings with their advisor and consistent advancement toward completing their thesis.

In addition to demonstrating satisfactory performance in academic, research and teaching responsibilities, maintaining high standards of professional and personal conduct is equally essential. For instance, a student may be dismissed for unethical, irresponsible, or unprofessional behavior. All students are expected to meet the professional and ethical standards established by the American Mathematical Society and the Graduate School.

The department reserves the right to place a student on probation for a minimum of 30 days if their academic progress, teaching performance, or conduct is deemed unsatisfactory. The DGS must inform the Graduate School as soon as the student is notified, and the probationary period begins. If the student does not meet the conditions set forth in their probation by the end of the period, a dismissal letter will be issued to the student.

Dismissal can occur at any time during a student's pursuit of a graduate degree.

6.3 Appeals

A student's first appeal of dismissal must be made to the department ***within two weeks of receipt of the dismissal letter.*** If a student does not appeal within that time frame, the Graduate School will send the student an official notice of dismissal from the program. More information about the appeals process is available here.

6.4 The university catalog with all academic policies

To quote directly from the graduate school policies: ``*It is each graduate student's responsibility to know and observe all regulations and procedures relating to the program the student is pursuing. In no case will a regulation be waived or an exception be granted because students plead ignorance of, or contend that they were not informed of, the regulations and procedures. Responsibility for following all policies and meeting all requirements and deadlines for graduate programs rests with the student*."

In addition to the policies described in this document, please refer to the University Catalog.

7. Taking Care of Yourself

Graduate school can be deeply rewarding, but it can also be demanding. Your well-being matters. Taking care of yourself is an important part of your success as a graduate student. Everyone needs support at times, and asking for help is a normal part of navigating graduate school. You do not have to handle difficult moments alone. There are people and resources at Mizzou who can help.

Mental Health Support

The MU Counseling Center provides mental health support, including brief individual therapy, group counseling, clinical skills classes, consultation, crisis support, and referrals to other campus or community resources. Students may call 573-882-6601 during business hours to schedule a brief screening. The Counseling Center is located on the 4th floor of Strickland Hall.

For urgent mental health concerns, students may call the MU Counseling Center crisis line at 573-882-6601. Crisis support is available 24/7; after business hours, press "0" to reach an on-call clinician. In a life-threatening emergency, always call 911.

Students may also call or text 988 to reach the 988 Suicide & Crisis Lifeline, or use the 988 online chat.

Additional Well-Being Resources

Students may also find the following resources helpful:

- Mental Health Resource Hub — a central Mizzou page collecting mental health, counseling, wellness, and support resources.
- TAO: Therapy Assistance Online — free online tools for Mizzou students, faculty, and staff.
- Group Therapy and Skills Classes — group support and skills-based classes offered through the Counseling Center.
- Well-Being Coaching — support through the Wellness Resource Center for goals related to well-being and daily life.
- Student Health Center — medical care and related health services for students.
- Care Team — case management and connections to campus and community resources, including support related to basic needs.

Students who are unsure where to begin can contact the MU Counseling Center or visit the Mental Health Resource Hub. Faculty, staff, and other students who are concerned about a student may also call 573-882-6601 for consultation about how to help.