DOCTOR OF PHILOSOPHY (PHD) DEGREE IN THE FIELD OF MATHEMATICS

Program Learning Outcomes for the MA and PhD Degrees in the field of Mathematics

Upon completing the MA and PhD degrees in the field of Mathematics, students will be able to:

1. Apply abstract structures from algebra, analysis, and topology to analyze and solve both concrete problems and conceptual questions.
2. Learn fundamental mathematics independently, outside the structure of a regular course.
3. Present mathematical results and reasoning in a compelling way to an audience of mathematicians.
4. Use the mathematical literature and databases to find theorems, constructions, or counterexamples.
5. Write clear and convincing proofs of one's own original mathematical results.

Requirements for the MA and PhD Degrees in the field of Mathematics

Students may not be admitted directly to the Master of Arts degree program in mathematics. Instead, graduate students in the Doctor of Philosophy degree program in the field of mathematics may earn the MA as they work towards the PhD in the field of mathematics. Admission to the PhD program in the field of mathematics is granted to a limited number of students who have illustrated an ability for advanced and original work. Normally, students take one or two years after the BA degree to obtain an MA degree, and they take four or five years to obtain a PhD. An MA is not a prerequisite for the PhD. For additional requirements, regulations, and procedures for all graduate programs, please see All Graduate Students (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/).

A number of graduate scholarships and fellowships are available, awarded on the basis of merit. As part of the graduate education in mathematics, students also engage in teaching or other instructional duties, generally for no more than six hours a week.

For courses carrying dual undergraduate and graduate numbers, (e.g., MATH 463/MATH 563), the 500-level version is intended to prepare students for advanced work in mathematics. In particular, written assignments should be prepared to high professional standards. Mathematics graduate students should enroll in the 500-level version.

MA Degree Program

The MA degree can be either a thesis or a non-thesis master's degree depending on the option the student pursues. For general university requirements for thesis master's degrees, please see Thesis Master's Degrees (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-thesis-masters-degrees/). For general university requirements for non-thesis master's degrees, please see Non-Thesis Master's Degrees (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-non-thesis-masters-degrees/). For additional requirements, regulations, and procedures for all graduate programs, please see All Graduate Students (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/).

Doctoral students may petition for these once they have satisfied all university and departmental requirements.

Student pursuing the MA degree in the field of Mathematics must complete:

- Complete with a grade of B (3.00 grade points) or better a course of study approved by the department. (Students may transfer credits from another university only with the approval of both the department and the University Graduate Council.)
- Perform satisfactorily on the general examinations in algebra, analysis, and topology or prepare and present an oral defense of an original thesis acceptable to the department

The requirements listed in the General Announcements (GA) satisfy the minimum requirements for this degree program. In certain instances, courses (or requirements) not officially listed here may be substituted upon approval of the program's academic advisor, or where applicable, the department or program's Director of Graduate Studies. Course substitutions or any exceptions to the stated official curricular requirements must be approved by the Office of Graduate and Postdoctoral Studies (https://graduate.rice.edu/). Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Code	Title	Credit Hours
	Total Credit Hours Required for the MA Degree in the field of Mathematics	30

Requirements for the PhD Degree in the field of Mathematics

PhD Degree Program

For general university requirements, please see Doctoral Degrees (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-doctoral-degrees/). For additional requirements, regulations, and procedures for all graduate programs, please see All Graduate Students (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/). Students pursuing the PhD degree in the field of Mathematics must:

- Complete with a grade of B (3.00 grade points) or better a course of study approved by the department (students may transfer credits from another university only with the approval of both the department and the University Graduate Council)
- Perform satisfactorily on qualifying examinations (see below)
- Write an original thesis acceptable to the department
- Perform satisfactorily on a final oral examination on the thesis

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curricular requirements must be approved by the Office of Graduate and Postdoctoral Studies (https://graduate.rice.edu/). Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Code	Title	Credit Hours
	Total Credit Hours Required for the PhD Degree in the field of Mathematics	90

Qualifying Examinations

The qualifying examinations in mathematics consist of the general examinations and the advanced oral examination.

To complete the **general examinations**, students must take exams, one each in algebra, analysis, and topology. Exams are offered every August, January, and May. Students may take any combination of exams at any time during their first four semesters in the program. Students must perform satisfactorily on all three exams by the May exams at the end of their fourth semester. The judgment of satisfactory performance on the general examinations for either the MA or PhD degree is the responsibility of the department graduate committee. Students may take an exam several times.

To complete the **advanced oral examination**, students must select a special field (e.g., homotopy theory, several complex variables, or group theory) and submit it to the department graduate committee for approval. The committee schedules an advanced examination in the selected field, normally 6 to 12 months after the student completes the general examinations. While students failing the advanced examination may, with the approval of the committee, retake it on the same or possibly on a different topic, they generally are not allowed to take the advanced examination more than twice.

Policies for the PhD Degree in the field of Mathematics

Department of Mathematics Graduate Program Handbook

The General Announcements (GA) is the official Rice curriculum. As an additional resource for students, the department of Mathematics publishes a graduate program handbook, which can be found here: (http://gradhandbooks.rice.edu/2017_18/Mathematics_Graduate_Handbook.pdf)https://gradhandbooks.rice.edu/2023_24/Mathematics_Graduate_Handbook.pdf

Transfer Credit

For Rice University's policy regarding transfer credit, see Transfer Credit (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer). Some departments and programs have additional restrictions on transfer credit. Students are encouraged to meet with their academic program's advisor when considering transfer credit possibilities.

Departmental Transfer Credit Guidelines

Students pursuing the PhD degree in the field of Mathematics should be aware of the following departmental transfer credit guidelines:

- Requests for transfer credit will be considered by the program director on an individual case-by-case basis.

Additional Information

For additional information, please see the Mathematics website: https://math.rice.edu/

Opportunities for the PhD Degree in the field of Mathematics

Additional Information

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