Doctor of Philosophy

The PhD is a degree of distinction not to be conferred in routine fashion after completion of a specific number of courses or after attendance in Graduate School for a given number of years.

The department offers programs leading to the PhD degree in the areas of algebra, analysis, applied mathematics, combinatorics, geometry, mathematical physics, numerical analysis, probability, statistics, and topology.

Master of Arts: Pre-PhD Requirements

Code	Title	Credits
Two 600-level mathematics sequences [1]		24-45
Other 600-level courses [1, 2]		12-15
Total Credits		**45**

1. Students must complete two 600-level sequences acceptable for the qualifying examinations in the PhD program. In addition, they must complete one other 600-level sequence or a combination of three terms of 600-level courses approved by the master's degree subcommittee of the graduate affairs committee.
2. As many as 15 credits from graduate-level courses outside mathematics may be used toward the degree.

Master of Science: Pre-PhD Requirements

Code	Title	Credits
Two 600-level mathematics sequences [1]		24-45
Other 600-level courses [1, 2]		12-15
Total Credits		**45**

1. Students must complete two 600-level sequences acceptable for the qualifying examinations in the PhD program. In addition, they must complete one other 600-level sequence or a combination of three terms of 600-level courses approved by the master's degree subcommittee of the graduate affairs committee.
2. As many as 15 credits from graduate-level courses outside mathematics may be used toward the degree.

Doctor of Philosophy

The PhD is a degree of distinction not to be conferred in routine fashion after completion of a specific number of courses or after attendance in Graduate School for a given number of years.

The department offers programs leading to the PhD degree in the areas of algebra, analysis, applied mathematics, combinatorics, geometry, mathematical physics, numerical analysis, probability, statistics, and topology. Advanced graduate courses in these areas are typically offered in Seminar: [Topic] (MATH 607). Each student, upon entering the graduate degree program in mathematics, reviews previous studies and objectives with the graduate advising committee. Based on this consultation, conditional admission to the master's degree program or the pre-PhD program is granted. A student in the pre-PhD program may also be a candidate for the master's degree.

Pre-PhD Program

To be admitted to the pre-PhD program, an entering graduate student must have completed a course of study equivalent to the graduate preparatory bachelor's degree program described above. Other students are placed in the master's degree program and may apply for admission to the pre-PhD program following a year of graduate study. Students in the pre-PhD program must take the qualifying examination by the beginning of their third year, during the week before classes begin fall term. It consists of examinations on two basic 600-level graduate course sequences, one each from two of the following three categories:

1. algebra
2. analysis and probability
3. topology and geometry

PhD Program

Admission to the PhD program is based on the following criteria:

- satisfactory performance on the qualifying examination
- completion of three courses at a level commensurate with study toward a PhD
- satisfactory performance in seminars or other courses taken as a part of the pre-PhD or PhD program.

Students who are not admitted to the PhD program because of unsatisfactory performance on the fall-term qualifying examination may retake the examination at the beginning of winter term.

A student in the PhD program is advanced to candidacy after passing a language examination and the comprehensive examination. To complete the requirements for the PhD, candidates must submit a dissertation, have it read and approved by a dissertation committee, and defend it orally in a formal public meeting.

Language Requirement

The department expects PhD candidates to be able to read mathematical material in a second language selected from French, German, and Russian. Other languages are acceptable in certain fields. To fulfill the language requirement, the student must meet with a faculty member—a doctoral advisor or a member of the PhD committee—to obtain advice for a suitable paper or book. The paper or book should be written in French, German, or Russian and have mathematical material beneficial to the student's area of study. After reading, translating, and understanding the material, the student meets with the faculty member again. The faculty member determines whether the student understands the material. If satisfied, the faculty member deems the requirement met and the decision is added in writing to the student's record.

Comprehensive Examination

This oral examination emphasizes the basic material in the student's general area of interest. A student is expected to take this examination by the end of the second academic year in the PhD program. To be eligible to take this examination, a student must have completed the language examination and nearly all the course work needed for the PhD.

Dissertation

PhD candidates in mathematics must submit a dissertation containing substantial original work in mathematics. Requirements for final defense of the dissertation are those of the Graduate School.