

Mathematics, PhD

Learning Outcomes

Students:

- have a broad foundational knowledge of mathematics, preparing them to teach a wide variety of mathematics courses at any four-year college or university in the United States, work in a wide variety of business, industry, and government positions, and hold leadership positions in these organizations;
- can identify and develop new lines of investigation that push forward frontiers of research;
- can bring together problem-solving tools to make new discoveries, including locating and understanding the most current research literature, working with interdisciplinary collaborators; and
- can communicate mathematics via professional writings and presentations at a level appropriate to the audience, from the general public to technical experts.

Requirements

The Doctor of Philosophy program in mathematics requires a minimum of 72 s.h. of graduate credit. Students must maintain a program grade-point average of at least 3.00. The program places a strong emphasis on preparation for research and teaching. The department maintains no division between pure and applied mathematics. It cooperates in interdisciplinary doctoral programs with the College of Education (see Teaching and Learning in the catalog) and the program in Applied Mathematical and Computational Sciences (Graduate College).

PhD students in mathematics must satisfy the following requirements for coursework (credits and breadth), examinations, world language, and the PhD thesis.

Students must spend at least three years in residence at a graduate college, including at least one year at the University of Iowa. They also should enroll in specific courses designated as preparatory for the PhD examinations; consult the Department of Mathematics graduate studies director.

To further encourage mathematical breadth, students must earn at least 27 s.h. of graduate credit in regular courses equivalent to or more advanced than PhD comprehensive examination preparatory courses. For a list of accepted Department of Mathematics courses and rules to ensure proper distribution, contact the department. Graduate students in mathematics must have departmental approval to earn credit for any of the courses numbered between 3000 and 4999. Analysis and computation graduate students in mathematics may not earn credit for MATH:4010 Basic Analysis and MATH:4020 Basic Abstract Algebra.

The PhD examinations consist of a qualifying exam and a comprehensive exam. Students choose three areas from the department's list of qualifying examination areas: algebra, analysis, differential equations, numerical analysis, and topology. For each qualifying area, there is a two-semester course sequence numbered 5000 or above that is designated as preparatory, although exams may differ from course content. Parts of the qualifying exam are taken over a two-week period. An exam committee gives one grade (pass, fail, conditional pass) on each part of the qualifying examination.

The PhD comprehensive exam tests students on research-related topics. Candidates also take an oral final examination on their dissertation material.

PhD students are required to demonstrate reading proficiency in French, German, or Russian by passing a reading test administered by the Department of Mathematics. Consult the department for details.

The most distinctive aspect of a PhD is the thesis. The department expects the thesis to be an original mathematical work comparable in content and writing quality to that found in standard published research journals. The thesis is written under the supervision of a mathematics department faculty member and must be approved by the PhD defense committee.

Admission

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations on the Graduate College website. Applicants to the PhD program have preference for admission and funding.

Admission to the PhD program is competitive and based on a combination of undergraduate or graduate coursework and grades, letters of recommendation, and test scores. Applicants to the PhD program must have an undergraduate or graduate grade-point average of at least 3.40.

Career Advancement

The Pomerantz Career Center offers multiple resources to help students find internships and jobs.