

# 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 complete the degree in residence 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.

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. Qualifying exams are taken over a one-week period. An exam committee gives one grade (PhD pass, master pass, fail) 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.

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.

## Graduate Education

Graduate education prepares students with advanced knowledge and skills in specialized fields. At the University of Iowa, the Graduate College advocates for student-centered graduate education and supports equitable application of rules and policies across graduate programs.

## Academics

University of Iowa graduate credentials are regulated by policies and requirements found in the Graduate College Manual of Rules and Regulations. This includes minimum grade-point average (GPA) requirements for academic standing and degree conferral. The Graduate College sets the minimum requirement. Individual graduate programs may establish higher GPA requirements.

## Admissions

Graduate student applicants must meet admission requirements for both the Graduate College and the program to which they have applied. University of Iowa graduate admission requirements are published by the Graduate College and on the Graduate Admissions website.

## Financial Support

Graduate students might be eligible for financial support. Several contingencies apply, including degree program and award type, satisfactory progress toward degree, satisfactory completion of all duties related to an appointment, and availability of funding. Graduate students should inquire directly with their program for more information about funding availability. The Graduate Student Employment Standards govern the employment relationship between the University of Iowa and all graduate teaching and research assistants in all matters except wages, which are covered by an existing collective bargaining agreement or the conditions of an applicable federal grant.

## 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.