Mathematics, M.S.

Requirements

The Master of Science program in mathematics requires a minimum of 30 s.h. of graduate credit. Students earn the degree through courses and comprehensive examinations. There is no M.S. thesis. Requirements (courses and comprehensive examination areas) may be modified with the department's consent.

Four different programs (I, II, III, and IV) lead to the M.S. in mathematics.

Program I

Program I prepares students for further study of pure and applied mathematics and for employment in government and business. Students in program I take several courses and pass two comprehensive examinations. They must earn a grade of B-minus or higher in six of the courses and maintain a g.p.a. of at least 2.75 in all mathematics courses taken for the degree.

Program I requires the following courses.

- MATH:5000 & MATH:5010 Abstract Algebra I-II (8)
- MATH:5200 & MATH:5210 Introduction to Analysis I-II (8)
- MATH:5400 General Topology (4)
- MATH:5410 Introduction to Smooth Manifolds (4)
- MATH:5600 Nonlinear Dynamics with Numerical Methods (4)
- MATH:5700 Partial Differential Equations with Numerical Methods (4)

The two comprehensive examinations are chosen from algebra, analysis, differential equations with numerical methods, and topology.

Program II

Program II is designed for secondary school teachers. Program II requirements are similar to those for programs I and III, but program II students complete two mathematics education courses and a minimum of 24 s.h. in Department of Mathematics courses. The following courses may be used to satisfy the program II mathematics course requirements.

- MATH:3600 Introduction to Ordinary Differential Equations (2-3)
- MATH:4060 Discrete Mathematical Models (3)
- MATH:4610 Continuous Mathematical Models (3)
- MATH:4820 Optimization Techniques (3)

The two comprehensive examinations are chosen from analysis, differential equations with numerical methods, numerical analysis, and topology.

Program III

Program III focuses on applied mathematics. Students in program III take several courses and pass two comprehensive examinations. They must earn a grade of B-minus or higher in six of the courses and maintain a g.p.a. of at least 2.75 in all mathematics courses taken for the M.S.

Program III requires the following courses.

- All of these:
  - MATH:5200 & MATH:5210 Introduction to Analysis I-II (8)
  - MATH:5600 Nonlinear Dynamics with Numerical Methods (4)
  - MATH:5700 Partial Differential Equations with Numerical Methods (4)
  - MATH:5800 Numerical Analysis: Nonlinear Equations and Approximation Theory (4)
  - MATH:5810 Numerical Analysis: Differential Equations and Linear Algebra (4)

Both courses in group A, or two courses from group B:

Group A
- MATH:5400 General Topology (4)
- MATH:5410 Introduction to Smooth Manifolds (4)

Group B
- MATH:4060 Discrete Mathematical Models (3)
- MATH:4610 Continuous Mathematical Models (3)
- MATH:4820 Optimization Techniques (3)

The two comprehensive examinations are chosen from analysis, differential equations with numerical methods, numerical analysis, and topology.

Program IV

Program IV is designed for nondepartmental students working toward a Ph.D. in areas of study that require mathematical knowledge. The program has no specific required courses.

Students in program IV are considered to have passed the comprehensive examination for the master's degree in mathematics if they have maintained a g.p.a. of at least 3.00 in all mathematics courses taken for the M.S. in mathematics and have successfully completed the Ph.D. comprehensive examination in their area of study.

Students in program IV are assigned a mathematics advisor, who works with them and their major advisor to plan an appropriate curriculum for the M.S. in mathematics. A suitable program of study should be approved by a mathematics advisor before the student takes the Ph.D. comprehensive examination, and a member of the mathematics faculty should serve on the Ph.D. comprehensive examination committee.

Admission

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

Admission to M.S. programs I, II, and III is competitive and based on a combination of undergraduate course work and grades, letters of recommendation, and test scores. Numerical standards change every year or so; exceptions may be made to the following guidelines.

Applicants must have completed work in an undergraduate program equivalent to the major in mathematics offered by the University of Iowa Department of Mathematics with an
undergraduate g.p.a. of at least 3.20. Relevance and difficulty of courses are considered when evaluating grades; grades of C or lower in mathematics courses must be balanced by grades of A. Individuals whose preparation does not meet this requirement may be admitted conditionally and are asked to take specific courses that cover deficiencies.

Applicants must score at least 155 on the quantitative section of the revised Graduate Record Examination (GRE) General Test (700 on the old GRE). Applicants whose first language is not English are required to demonstrate their competence in English, normally by scoring at least 105 (Internet-based) on the Test of English as a Foreign Language (TOEFL).

Applicants must submit three letters of recommendation.

### Career Advancement

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