Mathematics (M.S.)

About The Program:

The Department of Mathematics offers graduate work leading to the Master of Science degree. The aim of the M.S. program is to provide students with a foundation sufficient to pursue careers in mathematics in industry, government, or education. The program offers opportunities to conduct original research under the supervision of a faculty member.

Job Prospects: Graduates either continue advanced educational programs or pursue employment in industry, education, or government laboratories and agencies.

Prerequisites for Admission: Applicants must have completed fundamental undergraduate mathematics courses, and hold a baccalaureate degree from an accredited college or university.

Affiliation(s): The Mathematics program at Temple University is affiliated with the American Mathematical Society and the Mathematical Association of America.

Study Abroad: Department faculty are active internationally and sometimes travel overseas for conferences and extended research visits. In some cases, students may participate in these activities.

Areas of Specialization: The department has approximately 25 faculty members actively involved in research and graduate education. With a graduate student body of less than 40, we are a program of moderate size with a high faculty/student ratio. Thus, we provide students with unique opportunities for flexible program design and ample interaction with faculty. Classes are small and are held in an informal atmosphere enabling students and faculty to work closely together.

The department offers a great variety of choices for areas of specialization. A strong research presence exists in the following areas: algebra, computational mathematics, differential geometry and topology, geometric group theory, global geometry, harmonic analysis, invariant theory, mathematical biology, mathematical physics, mathematics of materials, numerical analysis, partial differential equations, probability, representation theory, and several complex variables. Both prospective and matriculated students are encouraged to browse faculty web pages and contact faculty directly for more detailed information regarding areas of specialization and opportunities for further research.

Requirements of Programs:

- **Total Credit Hours**: 30
- **Culminating Events**: After satisfying the 30-credit course requirement, students may choose between the following three options as the culminating event of the M.S. degree:
    a) Master's Thesis
    b) Master's Comprehensive Examination
    c) Master's Pass on the Ph.D. Comprehensive Examination

    Master's Thesis:
    Students who choose to submit a master's thesis must select a faculty advisor and a thesis advisory committee. These arrangements are subject to the approval of the Mathematics

Graduate Committee. The date, time, and location of a thesis defense are set by the Graduate Chair in consultation with the student's advisory committee.

Master's Comprehensive Examination:
For students selecting this option, a written Master's Comprehensive Examination will be composed by at least two departmental Graduate Faculty. The topics covered should correspond to the student's program of study as approved by the Graduate Committee. The exam is graded by at least two Mathematics faculty members, with grades of either Pass or Fail. Students interested in taking the Master's Comprehensive Examination are required to make a written request to the Graduate Chair at least four weeks in advance. If the examination is failed, it may be taken again once, or the student may attempt a master's pass on the Ph.D. Comprehensive Examination.

Master's Pass on the Ph.D. Comprehensive Examination:
Students choosing this option must take three of the separate 25-point sections of the written Ph.D. Comprehensive Examination. A student who achieves a total score of at least 40 on the three sections of the examination, with no individual section below 8, obtains a master's pass on the exam and has fulfilled the examination requirement for the M.S. degree. If one of the individual exam scores falls below 8 points, that exam may be repeated once, or the exam in a different topic may be attempted once, or the student may take the Master's Comprehensive Examination described above. Such arrangements are subject to approval by the Graduate Committee. The case of a student failing the comprehensive exam by a small margin is discussed by the department's Graduate Committee, which takes the student's whole academic record into account in its decision.

Core Courses

Required Courses:

The Master of Science degree requires 10 graduate courses at the 5000 level or above. The program of study must be designed in coordination with a Mathematics faculty advisor and approved by the departmental Graduate Committee. With the approval of the faculty advisor and Graduate Committee, relevant courses from departments other than Mathematics may be included.

The M.S. degree is offered with an optional concentration in Applied and Computational Mathematics. The concentration is designed for students interested in incorporating advanced study in mathematical and computational methods into the Master of Science program. Students pursuing this concentration complete at least 15 credits of coursework in applied and computational mathematics within their 30-credit degree program.

Courses:

Click HERE for more information on the courses below.

- Special Topics in Math
- Linear Algebra
- Concepts of Analysis
- Concepts of Analysis II
- Introduction to Numerical Analysis
- Introduction to Numerical Analysis II
- Ordinary Differential Equations
- Fundamentals of Computer Programming for Scientists and Engineers
- Introduction to High-Performance Computing Technology for Scientists
- Candidates Seminar
- Number Theory
- Introduction to Methods in Applied Mathematics I
- Introduction to Methods in Applied Mathematics II
- Abstract Algebra I
- Abstract Algebra II
- Numerical Linear Algebra I
- Numerical Linear Algebra II
- Numerical Differential Equations I
- Numerical Differential Equations II
- Probability Theory
- Stochastic Processes
- Real Analysis I
- Real Analysis II
- Functions of a Complex Variable I
- Functions of a Complex Variable II
- Differential Geometry and Topology I
- Differential Geometry and Topology II
- Mathematical Modeling for Science, Engineering, and Industry
- Partial Differential Equations I
- Partial Differential Equations II
- Topology
- Topics in Applied Mathematics
- Topics in Applied Mathematics II
- Topics Computer Program
- Teaching in Higher Education
- Topics in Number Theory I
- Modular Functions
- Combinatorial Mathematics
- Topics in Number Theory II
- Homological Algebra
- Representation Theory I
- Representation Theory II
- Commutative Algebra and Algebraic Geometry I
- Commutative Algebra and Algebraic Geometry II
- Riemannian Geometry
- Knot Theory and Low-Dimensional Topology I
- Knot Theory and Low-Dimensional Topology II
- Advanced Probability Theory
- Functional Analysis I
- Functional Analysis II
- Calculus of Variations
- Harmonic Analysis
- Several Complex Variables I
- Several Complex Variables II
- Harmonic Analysis
- Lie Groups
- Riemann Surfaces
- Differential Topology
- Geometric Group Theory
- Independent Study
- Topics in Algebra
- Seminar in Algebra
- Topics in Numerical Analysis
- Seminar in Probability
- Topics in Analysis
- Topics in Functional Analysis
- Topics in Differential Equations II
- Master's Research Projects
- Preliminary Examination Preparation
- Capstone Project
- Master's Thesis Research