

M.S. Mathematics, Emphasis in Applied Math

This degree is recommended for students interested in a career as an applied mathematician or students interested in other occupations, which require a strong background in mathematics. The degree will prepare students for a variety of careers where they will apply mathematics in business, government, or industry. Most jobs as an applied mathematician require a Master's degree. The MS Math, Emphasis in Applied Math, will allow students who have received a BS in Applied and Computational Math to pursue a Master's degree in Applied Math thus enhancing their prospects of employment as an applied mathematician. The MS Math, Emphasis in Applied Math is also designed so that students without a BS in Applied Math can obtain this degree, helping students acquire the mathematical background necessary to apply mathematical methods to analyze problems in their chosen field. There are 3 suggested options for the MS Math, Emphasis in Applied Math: differential equations, numerical analysis, or discrete math.

Requirements for Admission to Classified Standing

Admission requirements to classified standing for this degree are the same as for the MS Mathematics program. The 24 semester units of required upper division math should include an upper division sequence in applied math, either Math 133A and Math 133B (Differential Equations), Math 143C and Math 143M (Numerical Analysis), or Math 142 and Math 179 (Discrete Math).

Requirements for Admission to Conditionally Classified Standing

Admission requirements for conditionally classified standing for this degree are the same as for the MS Mathematics program.

Requirements for Admission to Candidacy for the MS Mathematics

Requirements are the same as for the MS Mathematics except that the Specialist Exam is an individualized written or oral exam on fundamental ideas related to the Emphasis in Applied Math. This exam covers the materials in either Math 133A and Math 133B (Differential Equations), Math 143C and 143M (Numerical Analysis), or Math 142 and Math 179 (Discrete Math).

Financial Support

Students in this program can receive financial support by being a TA or a grader in the Mathematics Department.

Completing Requirements for the MS Mathematics

Both Plan A (with Thesis) and Plan B (with Writing Project) requirements are the same as in the MA Mathematics except that the thesis or writing project must be in the field of applied math.

Required Courses 18 units

Graduate Applied Math Courses 12 units

Students are required to take one of the following three options.

Discrete Math option

Math 279AB Graph Theory 6 units

Two courses chosen from Math 229 Matrix Theory, Math 221A Abstract Algebra, or another upper division or graduate discrete math course approved by the your thesis advisor or the graduate math coordinator Richard Kubelka 6 units

Differential Equations option

Math 233AB Applied Math 6 units

Two courses chosen from Math 234 Advanced Dynamical Systems, Math 235 Wavelets, Math 238 Complex Analysis, or another upper division or graduate applied math course

approved by your thesis advisor or the graduate math coordinator Richard Kubelka 6 units

Numerical Analysis option

Math 243AB Advanced Numerical Analysis 6 units
Two courses chosen from Math 233A Applied Mathematics I, Math 233B Applied Mathematics II or another related upper division or graduate applied math course approved by your thesis advisor or the graduate math coordinator Richard Kubelka 6 units

Other Required Courses 9 Units

Students are also required to take a statistics course, participate in a CAMCOS project (or a pre-approved internship) for one semester. In CAMCOS a professor supervises a team of students working on a problem provided by a sponsoring business or industry. All students will help preparing a written report and giving an oral presentation of their research at the conclusion of each CAMCOS project. Students are also required to write and give an oral defense of a thesis (or writing project) related to applied math. Both of these activities should help students develop their oral and written communication skills.

Statistics 3 units
Math 261A or 261B or 265 or 266 or an upper division statistics course approved by your advisor

CAMCOS (or an approved internship) 3 units
Math 203 Applied Math, Computation, and Statistics Projects 3 units

Thesis or Writing Project (in an area related to applied math) 3 units
Math 298 or Math 299 3 units

Electives 12 units

Any 100- or 200- level math classes except Math 100W, Math 101, Math 105, Math 106, Math 107A, Math 107B, Math 201A, or Math 201B can be used as electives. With prior approval up to 6 units of upper division or graduate courses in computer science, science, engineering, economics, business or other areas related to applied math can be used as electives. In addition to the 6 required units of Math 203, 298, and 299 at most 3 additional units of Math 203 and 3 additional units of Math 298, 299 can be counted as electives.

In choosing elective courses students should keep in mind the importance of 1) developing a specific field of interest where mathematics can be applied, 2) the ability to use computers in analyzing mathematical problems, 3) the ability to use statistics to analyze data, and 4) the ability to communicate effectively. Knowledge of a specific field where mathematics can be applied will help you understand the subject matter and technical background of the problems you work on. Students in this program are encouraged to take 6 units of upper division or graduate electives in an area outside of mathematics, where mathematics can be applied. Because of the widespread use of computers in mathematics and the growing number of widely used software packages, mathematicians in all industries will find it useful to have good computing skills and the ability to use mathematical software. In an increasingly quantitative world the ability to apply statistics in analyzing data is become more and more important. Good verbal and written communication skills will help you communicate the results of your mathematical and statistical analyses effectively.

A total of 18 units of 200-level courses are required for this degree (excluding Math 201A, Math 201B, Math 203, Math 298, and Math 299).

Applied Math Faculty/Advisors in the Math Department
Same as the advisors for the MS Mathematics degree.