APPLIED MATHEMATICS & STATISTICS, AND SCIENTIFIC COMPUTATION (AMSC)

Graduate Degree Program
College: Computer, Mathematical, and Natural Sciences

Abstract

The interdisciplinary program in Applied Mathematics & Statistics, and Scientific Computation (AMSC) offers graduate study leading to Master of Science and Doctor of Philosophy degrees with concentrations in applied mathematics, applied statistics, and scientific computation. It also offers a Certificate in Scientific Computation to graduate students enrolled in other university Ph.D. programs. The faculty is drawn from departments throughout the university. Possible areas of application include the physical, chemical, biological, and social sciences, and engineering. The program receives substantial support from the Department of Mathematics (MATH), the Center for Scientific Computation and Mathematical Modeling (CSCAMM), and the Institute for Physical Science and Technology (IPST). AMSC offers a spectrum of courses at the forefront of computation and applications, as well as state-of-the-art computational, visualization and networking facilities.

The Concentration in Applied Mathematics trains individuals who are able to enhance their understanding of a wide spectrum of scientific phenomena through the application of rigorous mathematical analysis. At least half of the required work is expected to be in courses with primarily mathematical content; the remaining courses must apply to a field outside of the usual mathematics curriculum in the student's chosen area of application. Graduate students currently pursue studies in the applications areas such as meteorology, fluid dynamics, algorithm development, pattern recognition, operations research, mathematical finance, computational dynamics, structural mechanics, mathematical biology, and systems and control theory. Other areas of study are available through participating departments. All students must include numerical analysis or scientific computing courses in their program of study.

The Concentration in Applied Statistics emphasizes acquisition of advanced training in the area of statistical application along with statistical topics and development of mathematical and computing skills necessary for the modern applied statistician. Students are required to take a series of core statistical and computational courses with more emphasis on data analytics and presentation skills. In addition, students will take a minimum of six credits in an outside application area.

The Concentration in Scientific Computation emphasizes the application of computation to the physical sciences, life sciences, engineering, business, and social sciences. Students will receive training in the use of computational techniques and technology with correspondingly less emphasis on formal mathematical methods in comparison to the Concentration in Applied Mathematics. Every Scientific Computation student is required to apply the training in computation to a problem in a specific scientific discipline.

A master's degree program in all concentrations with an emphasis on numerical analysis, computational methods, probability and statistics is excellent preparation for industrial or government employment.

Financial Assistance

The program offers teaching assistantships in the Department of Mathematics as a source of support for graduate students. These assistantships carry a stipend with remission of tuition of up to 10 credit hours each semester. Research assistantships are also available through participating departments and other sources, especially for students that have acquired advanced training. Assistantships are usually available only to incoming Ph.D. students; applications including letters of recommendation should be completed by December 15 for full consideration.

Contact

For more specific information, visit the program FAQ or email amsc@umd.edu (amsc@amsc.umd.edu).

Jessica Sadler
Program Manager
Department of Mathematics
Applied Mathematics & Statistics, and Scientific Computation Program
3103 William E. Kirwan Hall
4176 Campus Drive
University of Maryland
College Park, MD 20742
Telephone: 301.405.0924
Email: amsc@umd.edu (amsc@amsc.umd.edu)

Website: https://amsc.umd.edu

Courses: AMSC (https://academiccatalog.umd.edu/graduate/courses/amsc/)

Relationships: Aerospace Engineering (ENAE) (https://academiccatalog.umd.edu/graduate/programs/aerospace-engineering-enae/), Animal Sciences (ANSC) (https://academiccatalog.umd.edu/graduate/programs/animal-sciences-ansc/), Astronomy (ASTR) (https://academiccatalog.umd.edu/graduate/programs/astronomy-astr/), Atmospheric and Oceanic Science (AOSC) (https://academiccatalog.umd.edu/graduate/programs/atmospheric-oceanic-science-aosc/), Biological Sciences (BISI) (https://academiccatalog.umd.edu/graduate/programs/biological-sciences-bisi/), Business and Management (BPHD) (https://academiccatalog.umd.edu/graduate/programs/business-management-bphd/), Chemical Engineering (ENCH) (https://academiccatalog.umd.edu/graduate/programs/chemical-engineering-ench/), Civil and Environmental Engineering (ENCE) (https://academiccatalog.umd.edu/graduate/programs/civil-environmental-engineering-ence/), Computer Science (CMSC) (https://academiccatalog.umd.edu/graduate/programs/computer-science-cmsc/), Economics (ECON) (https://academiccatalog.umd.edu/graduate/programs/economics-econ/), Electrical and Computer Engineering (ENEE) (https://academiccatalog.umd.edu/graduate/programs/electrical-computer-engineering-enee/), Geology (GEOL) (https://academiccatalog.umd.edu/graduate/programs/geology-geol/), Government and Politics (GVPT) (https://academiccatalog.umd.edu/graduate/programs/government-politics-gvpt/), Mechanical Engineering (ENME) (https://academiccatalog.umd.edu/graduate/programs/mechanical-engineering-enme/), Physics (PHYS) (https://academiccatalog.umd.edu/graduate/programs/physics-phys/)

ADMISSIONS

GENERAL REQUIREMENTS

- Statement of Purpose
- Transcript(s)
- TOEFL/IELTS/PTE (international graduate students (https://gradschool.umd.edu/admissions/english-language-proficiency-requirements/))

PROGRAM-SPECIFIC REQUIREMENTS

- Letters of Recommendation (3)
- Graduate Record Examination (GRE) (optional)
- GRE Subject (optional)
- CV/Resume
- Description of Research/Work Experience (optional)

In addition to the Graduate School requirements, applicants should have at least a "B" average (3.0 on a 4.0 scale) and should have completed an undergraduate program of study that includes a strong emphasis on rigorous mathematics, preferably through the level of advanced calculus and linear algebra.

Admission will be based on the applicant's ability to do graduate work in either applied mathematics, applied statistics, or scientific computation as demonstrated by the letters of recommendation, grades in coursework, and program of study. In some circumstances, a provisional admission may be given to applicants whose mathematical training is not sufficiently advanced. Previous education in an application area such as physics, biology, economics or one of the engineering disciplines, and a basic competence in computational techniques will be favorably considered in a student's application, although this is not a prerequisite.

When a student has decided upon an area of specialization, an advisory committee is formed and approved by the AMSC Graduate Committee. The advisory committee is responsible for formulating with the student a course of study that leads toward the degree sought. This course of study must constitute a unified, coherent program in an acceptable field of specialization of applied mathematics, applied statistics, or scientific computation.

APPLICATION DEADLINES

Type of Applicant	Fall Deadline
Domestic Applicants	
US Citizens and Permanent Residents	December 17, 2024
International Applicants	
F (student) or J (exchange visitor) visas; A,E,G,H,I and L visas and immigrants	December 17, 2024

RESOURCES AND LINKS:

Program Website: amsc.umd.edu (https://www.amsc.umd.edu)
Application Process: https://gradschool.umd.edu/admissions (https://gradschool.umd.edu/admissions/)

REQUIREMENTS

- Applied Mathematics & Statistics, and Scientific Computation, Doctor of Philosophy (Ph.D.) (https://academiccatalog.umd.edu/graduate/programs/applied-mathematics-statistics-scientific-computation-amsc/applied-mathematics-statistics-scientific-computation-phd/)
- Applied Mathematics & Statistics, and Scientific Computation, Master of Science (M.S.) (https://academiccatalog.umd.edu/graduate/programs/applied-mathematics-statistics-scientific-computation-amsc/applied-mathematics-statistics-scientific-computation-ms/)

FACILITIES AND SPECIAL RESOURCES

There are over 25 participating departments and institutes on the College Park campus, including units in the College of Computer, Mathematical, and Natural Sciences and the School of Engineering. The university has an engineering technical library as well as a network of high performance workstations for faculty and graduate students. In addition, there are collaborations with various area research institutes such as NASA Goddard Space Flight Center, National Institutes of Health, National Institute of Standards and Technology, Naval Research Laboratory, and National Oceanic and Atmospheric Administration.