

Mathematics MA, Data Science Emphasis

Admission Requirements

Applicants must have at least a bachelor's degree in mathematics or in a field with significant mathematical content. Examples of such fields include computer science, data science, economics, engineering and physics. An applicant's record should demonstrate superior achievement in undergraduate mathematics.

Individuals may apply for direct admission to either the M.A. or Ph.D. program. Candidates for the M.A. degree may choose an emphasis in mathematics or data science. Students in the M.A. program who want to transfer to the Ph.D. program upon successful completion of 15 credit hours must fill out a new application through Graduate Admissions.

Students intending to enter the Ph.D. program must have a working ability in modern programming technologies. A student with a deficiency in this area may be required to take courses at the undergraduate level in computer science.

Applicants for the Ph.D. program must, in addition, submit three letters of recommendation and scores from the Graduate Record Examination (GRE) general aptitude test.

Preliminary Advisement

Incoming students are assigned advisers with whom they should consult before each registration period to determine an appropriate course of study. If necessary, students may be required to complete undergraduate course work without receiving graduate credit.

Students interested in the Ph.D. program in mathematical and computational sciences with the computer science option must follow the requirements for that program and that option.

Candidates for the M.A. degree must complete 30 hours of course work with at least 15 hours of courses numbered 5000 or above. All courses numbered below 5000 must be completed with grades of at least B. The selections of the courses numbered 5000 or above need the prior approval of the graduate advisor. The courses taken must include those listed below in the mathematics core and other seven mathematics courses numbered 4000 or higher with at least five courses numbered 5000 or above. For the data science option, the courses taken must include the data-science core courses listed below and five elective courses chosen from the listed below in the data-science electives. Up to 2 courses in the data-science electives can be substituted with other courses upon student's request and graduate program director's approval.

Students who have already completed courses equivalent to those in the core may substitute other courses numbered above 4000. All substitutions of courses for those listed in the core require the prior approval of the graduate director.

Thesis Option

Either for the mathematics option or for the data science option, the non-core course work may consist of an M.A. thesis written under the direction of a faculty member in the Department of Mathematics and Computer Science. A thesis is not, however, required for this degree. A student who wishes to write a thesis should enroll in 6 hours of MATH 6900, M.A. Thesis. Students writing an M.A. thesis must defend their thesis in an oral

exam administered by a committee of three department members which includes the thesis director.

Core Courses

MATH 4005	Exploratory Data Analysis with R	3
MATH 4200	Mathematical Statistics I	3
MATH 4210	Mathematical Statistics II	3
MATH 5070	Nonlinear Optimization	3
MATH 5250	Statistical Methods in Learning and Modeling	3

Elective Courses 15

Choose five of the following courses:

MATH 4220	Bayesian Statistical Methods
MATH 4260	Introduction to Stochastic Processes
MATH 5080	Scientific Computation
MATH 5090	High-dimensional Data Analysis
MATH 5225	Statistical Computing
MATH 5320	Topics in Statistics and its Applications
MATH 5600	Topics in Computation
MATH 5770	Advanced Topics in Nonlinear Optimization
CMP SCI 5340	Machine Learning
CMP SCI 5342	Data Mining

Total Hours 30

Financial Assistance

Any student who intends to apply for financial assistance, in the form of a teaching assistantship or a research assistantship, is required to have three letters of recommendation submitted with the application to the graduate program in Mathematics or Computer Science. The application must include scores on the GRE general aptitude test. Applicants are also encouraged to submit scores in the GRE subject area test in Mathematics or Computer Science. Applications for financial assistance should be submitted before February 15 prior to the academic year in which the student expects to begin graduate study. Notifications of awards are generally made March 15, and students awarded financial assistance are expected to return letters of acceptance by April 15.