# Mathematics MA, Data Science Emphasis

#### **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.

### **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.

#### **Degree Requirements**

Candidates for the M.A. degree must complete 30 hours of course work with at least 15 hours of courses numbered 5000 or above. Up to 6 credit hours can be completed outside the Department of Mathematics and Statistics in a related field, with graduate program director's prior approval. Up to 9 graduate credit hours could be transferred into the the program, pending the approval of the Graduate School. 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.

For the M.A. degree with data science emphasis, the courses taken must include the data-science core courses and five elective courses chosen from the data-science electives listed below. 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**

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 Statistics. 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 5250	Statistical Methods in Learning and Modeling	3
Elective Courses		18
Choose six of the following courses:		
MATH 4220	Bayesian Statistical Methods	
MATH 4260		
MATH 5070		
MATH 5080	Scientific Computation	
MATH 5090	High-dimensional Data Analysis	
MATH 5225	Statistical Computing	
MATH 5320	Topics in Statistics and its Applications	
MATH 5470	Statistical Data Analysis for GIS	
MATH 5480	Remote Sensing Digital Image Analysis	
MATH 5600		
MATH 5750	Mathematics of Artificial Neural Networks	
MATH 5770		
CMP SCI 4200	Python for Scientific Computing and Data Science	
CMP SCI 5300	Artificial Intelligence	
CMP SCI 5340	Machine Learning	
CMP SCI 5342	Data Mining	
CMP SCI 5390	Deep Learning	
SCMA 5300	Business Analytics	

**Total Hours** 

## **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.

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