

MA in Mathematics

Master of Arts in Mathematics

~~Candidates for the M.A. degree must complete 30 hours of course work. All courses numbered below 5000 must be completed with grades of at least B. The courses taken must include those listed below in group A together with additional courses discussed in B.~~

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

~~A. Mathematics core:~~

MATH 4100	Real Analysis I	3
MATH 4160	Complex Analysis I	3
MATH 4450	Linear Algebra	3
Total Hours		9

~~B. M.A. candidates must also complete 15 hours of course work numbered 5000 or above, chosen with the prior approval of the graduate director. Courses may be chosen to develop expertise in either pure or applied mathematics.~~

Thesis Option

~~Part of B) 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.~~

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 program has two options:

- **Mathematics option**
- **Data Science option**

For the mathematics option, 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.

Mathematics

Core Courses		
MATH 4100	Real Analysis I	3
MATH 4160	Complex Analysis I	3
MATH 4450	Linear Algebra	3
Electives ¹		21

Total Hours	30
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¹ Electives must be seven mathematics courses numbered 4000 or higher with at least five courses numbered 5000 or above

Data Science Emphasis

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

Sign-offs from other departments affected by this proposal

None

Rationale

The proposed emphasis area takes the advantage of the strength of the department in Statistics, Applied Mathematics and Computer Science to carefully package some existing courses and recently created new courses into a program that will train students the skills highly demanded in today's job market.