

MATHEMATICS, MA

Department of Mathematics and Statistical Sciences, College of Arts & Sciences

Vision Statement

The Master of Arts in mathematics is designed to achieve two objectives:

- Provide a strong program of course work in mathematics beyond the undergraduate level and
- Be flexible enough to accommodate a wide variety of student interests and backgrounds. There are no required courses in the program, but students are strongly encouraged to develop an emphasis in the courses which make up their individual plan of study; such an emphasis provides both focus and depth in the graduate experience.

Whatever their objectives in their graduate programs, students should form a close working relationship with a faculty member having similar mathematical interests as soon as possible. This will ensure good advice in planning a coherent plan of study. In addition, an advisor may be able to suggest special topics courses, independent study, or the thesis option which could all be used to pursue one's interests in greater depth.

Finally, students who plan to pursue a doctoral degree in mathematics should include a sequence in analysis and a sequence in algebra in their plans of study.

Program Contact Information

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Program Website (<http://www.unomaha.edu/math/>)

Other Program Related Information

Fast Track Program

The Department of Mathematics and Statistical Sciences has developed a Fast Track program for highly qualified and motivated students providing the opportunity to complete a bachelor's degree and a master's degree in an accelerated time frame. With Fast Track, students may count up to 9 graduate hours toward the completion of their undergraduate program as well as the graduate degree program.

Program Specifics:

- This program is available for undergraduate students pursuing a BA/BS in Mathematics or pursuing a double-major with BA/BS in Mathematics as the primary or secondary major desiring to pursue a MA/MS/MAT in Mathematics.
- Students must have completed no less than 60 undergraduate hours
- Students must have a minimum undergraduate GPA of 3.0.
- Students must complete the Fast Track Approval form, obtain all signatures, and submit to the Office of Graduate Studies prior to first enrollment in a graduate course.
- Students will work with their undergraduate advisor to register for the graduate courses.
- A minimum cumulative GPA of 3.0 is required for graduate coursework to remain in good academic standing.
- Students remain undergraduates until they meet all the requirements for the undergraduate degree and are eligible for all rights and privileges granted undergraduate status including financial aid.
- Near the end of the undergraduate program, formal application to the graduate program is required. The application fee will be waived, the

applicant will need to contact the Office of Graduate Studies for a fee waiver code.

- Admission to Fast Track does NOT guarantee admission to the graduate program.
- The admit term must be after the completion term of the undergraduate degree.

Graduate Assistantships

The Department of Mathematics and Statistical Sciences annually awards graduate assistantships for work within the department. All of these positions pay an annual stipend plus a waiver of tuition. For the details of the nature of the work, please visit the assistantships page of the Department of Mathematics and Statistical Sciences website.

Admissions

General Application Requirements and Admission Criteria (<http://catalog.unomaha.edu/graduate/admission/>)

Program-Specific Requirements

Application Deadlines (Spring 2024, Summer 2024, and Fall 2024)

- Fall: July 31
- Spring: November 30
- Summer: April 15

Other Requirements

For unconditional admission, an applicant should:

- Have completed a bachelor's degree with a grade point average of at least 3.0 in mathematics courses taken.
- Have completed 15 credit hours of mathematics courses beyond calculus, including MATH 3230/MATH 8235 or equivalent.
- Applicants lacking the 15 credit hours beyond calculus may be eligible for admission in a provisional or unclassified status with a deficiency to be made up in addition to the degree requirements listed.
- Applicants who satisfy the admission requirements above except for the GPA requirement may be granted provisional admission to the graduate program. They will be granted unconditional admission upon completion of 12 graduate hours with a grade of "B" or better in each course.
- **English Language Proficiency:** Applicants are required to have a command of oral and written English. Those who do not hold a baccalaureate or other advanced degree from the United States, **OR** a baccalaureate or other advanced degree from a predetermined country on the waiver list, must meet the minimum language proficiency score requirement in order to be considered for admission.
 - Internet-based TOEFL: 80, IELTS: 6.5, PTE: 53, Duolingo: 110

Degree Requirements

Required Courses

There are no required courses. Choose mathematics courses with a MATH or STAT prefix numbered 8000 or above and ending in the digit zero or six, excluding MATH 8880. At least 15 of these hours must be in courses with a number ending in the zero digit. These 15 hours may include the six hours of thesis, MATH 8990, and three hours of independent study, MATH 8970.

Electives

Since all courses are electives with the exception of the six thesis credit hours, all courses taken must satisfy the above requirements for the 30 credit hours. Up to 12 hours of graduate work electives may be taken in areas related to mathematics such as physics, computer science,

and economics, if permission is obtained from the Graduate Program Committee.

Exit Requirements

Students are required to take six hours of MATH 8990. All candidates should carefully review the Graduate College requirements for forming the Supervisory Committee, Thesis/Thesis Equivalent Proposal Approval forms, and final approval and submission of the thesis.

Concentrations

Students may choose (although there is no requirement to do so) to add a concentration to their Mathematics MA degree. There are currently three available concentrations:

Mathematics, MA with Computational Mathematics Concentration
Mathematics, MA with Operations Research Concentration
Mathematics, MA with Statistics Concentration

Total Credit Hours: 30

Concentrations

Computational Mathematics Concentration

Code	Title	Credits
Core Courses		
Select at least 5 of the following:		15
MATH 8336	INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS ¹	
MATH 8250	PARTIAL DIFFERENTIAL EQUATIONS	
MATH/CSCI 8500	NUMERICAL LINEAR ALGEBRA	
MATH/CSCI 8510	NUMERICAL DIFFERENTIAL EQUATIONS	
MATH 8406	THE FINITE ELEMENT METHOD ¹	
MATH 8970	INDEPENDENT GRADUATE STUDIES	
Electives		
Select at least 9 credit hours of courses related to computational mathematics (see below).		9
MATH 8990	THESIS	6
Total Credits		30

¹ Students who were undergraduates at UNO and took MATH 4330, or MATH 4400 may not take MATH 8336 or MATH 8406 at the graduate level. Students will replace these requirements with additional elective courses.

Electives

At least 9 credit hours of courses related to computational mathematics. Students must have at least 15 hours of courses ending on 0, including the core courses and the 6 hours of thesis, MATH 8990.

Some suggested courses are provided below. Other elective courses may be possible with the prior permission of the graduate program chair.

If any of the core course requirements were waived, then additional electives should be taken in their place.

Code	Title	Credits
MATH 8356	ORDINARY DIFFERENTIAL EQUATIONS ¹	3
MATH 8056	LINEAR ALGEBRA ¹	3
MATH 8236	MATHEMATICAL ANALYSIS I ¹	3
MATH 8246	MATHEMATICAL ANALYSIS II ¹	3
MATH 8276	COMPLEX ANALYSIS ¹	3
MATH 8400	DYNAMICAL SYSTEMS AND CHAOS	3

MATH/CSCI 8766	TOPICS IN APPLIED MATHEMATICS	3
MATH 8970	INDEPENDENT GRADUATE STUDIES	1-3

¹ Students who were undergraduates at UNO and took MATH 4350, MATH 4050, MATH 4230, MATH 4240 or MATH 4270 may not take MATH 8356, MATH 8056, MATH 8236, MATH 8246, or MATH 8276 at the graduate level.

Exit Requirement

Students are required to take 6 hours of MATH 8990. All candidates should carefully review the Graduate College requirements for forming the Supervisory Committee, Thesis/Thesis Equivalent Proposal Approval forms, and final approval and submission of the thesis.

Operations Research Concentration

Code	Title	Credits
Core Courses		
Select at least 5 of the following:		15
MATH/CSCI 8306	DETERMINISTIC OPERATIONS RESEARCH MODELS ¹	
MATH/CSCI 8316	PROBABILISTIC OPERATIONS RESEARCH MODELS ¹	
MATH 8326	COMPUTATIONAL OPERATIONS RESEARCH ¹	
MATH 8430	LINEAR PROGRAMMING	
MATH 8440	NETWORK PROGRAMMING	
MATH 8460	INTEGER PROGRAMMING	
Electives		
Select at least 9 credit hours of courses related to operations research (see below).		9
MATH 8990	THESIS	6
Total Credits		30

¹ Students who were undergraduates at UNO and took MATH 4300, MATH 4310, or MATH 4320 may not take MATH 8306, MATH 8316, or MATH 8326 at the graduate level. Students will replace these requirements with additional elective courses.

Electives

At least 9 credit hours of courses related to operations research. Students must have at least 15 hours of courses ending on 0, including the core courses and the 6 hours of thesis, MATH 8990.

Some suggested courses are provided below. Other elective courses may be possible with the prior permission of the graduate program chair.

If any of the core course requirements were waived, then additional electives should be taken in their place.

Code	Title	Credits
MATH/CSCI 8156	GRAPH THEORY & APPLICATIONS ¹	3
MATH/CSCI 8520	ADVANCED TOPICS IN OPERATIONS RESEARCH	3
MATH 8650	INTRODUCTION TO PROBABILITY MODELS	3
MATH 8746	INTRODUCTION TO PROBABILITY AND STATISTICS I ¹	3
MATH 8756	INTRODUCTION TO PROBABILITY AND STATISTICS II ¹	3
MATH 8970	INDEPENDENT GRADUATE STUDIES	1-3
STAT 8416	INTRODUCTION TO DATA SCIENCE ¹	3

STAT 8426	EXPLORATORY DATA VISUALIZATION AND QUANTIFICATION ¹	3	STAT 8730	ADVANCED STATISTICAL MACHINE LEARNING	3
STAT 8436	LINEAR MODELS ¹	3			
STAT 8446	TIME SERIES ANALYSIS ¹	3			

¹ Students who were undergraduates at UNO and took MATH 4740, MATH 4750, MATH 4150, STAT 4410, STAT 4420, STAT 4430, or STAT 4440 may not take MATH 8746, MATH 8756, MATH 8156, STAT 8416, STAT 8426, STAT 8436, or STAT 8446 at the graduate level.

Exit Requirement

Students are required to take 6 hours of MATH 8990. All candidates should carefully review the Graduate College requirements for forming the Supervisory Committee, Thesis/Thesis Equivalent Proposal Approval Forms, and final approval and submission of the thesis.

Statistics Concentration

Code	Title	Credits
Core Courses		
MATH 8746	INTRODUCTION TO PROBABILITY AND STATISTICS I ¹	3
MATH 8756	INTRODUCTION TO PROBABILITY AND STATISTICS II ¹	3
STAT 8436	LINEAR MODELS ¹	3
STAT 8710	DESIGN AND ANALYSIS OF EXPERIMENTS	3
Electives		
Select at least 12 credit hours of courses with a statistical nature (see below)		12
MATH 8990	THESIS	6
Total Credits		30

¹ Students who were undergraduates at UNO and took MATH 4740, MATH 4750, or STAT 4430 may not take MATH 8746, MATH 8756, or STAT 8436 at the graduate level. Students will replace these requirements with additional elective courses.

Electives

At least 12 credit hours of courses with a statistical nature, with at least 6 credit hours of courses ending in 0.

Some suggested courses are provided below. Other elective courses may be possible with the prior permission of the graduate program chair.

If any of the core course requirements were waived, then additional electives should be taken in their place.

Code	Title	Credits
MATH/CSCI 8316	PROBABILISTIC OPERATIONS RESEARCH MODELS ¹	3
MATH 8650	INTRODUCTION TO PROBABILITY MODELS	3
MATH 8670	TOPICS IN PROBABILITY AND STATISTICS	3
MATH/CSCI 8766	TOPICS IN APPLIED MATHEMATICS	3
MATH 8970	INDEPENDENT GRADUATE STUDIES	1-3
STAT 8416	INTRODUCTION TO DATA SCIENCE ¹	3
STAT 8426	EXPLORATORY DATA VISUALIZATION AND QUANTIFICATION ¹	3
STAT 8446	TIME SERIES ANALYSIS ¹	3
STAT 8700	BAYESIAN STATISTICS	3
STAT 8720	RELIABILITY THEORY	3

¹ Students who were undergraduates at UNO and took MATH 4310, STAT 4410, STAT 4420, or STAT 4440 may not take MATH 8316, STAT 8416, STAT 8426 or STAT 8446 at the graduate level.

Exit Requirement

Students are required to take 6 hours of MATH 8990. All candidates should carefully review the Graduate College requirements for forming the Supervisory Committee, Thesis/Thesis Equivalent Proposal Approval Forms, and final approval and submission of the thesis.