MATHEMATICS, MS: STATISTICS

Mathematics MS: Statistics (Option B)

Currently enrolled students have the option of following the old or new requirements. Students entering in **Fall 2014** or later must complete the new requirements.

Overview of Mathematical Sciences Department MS programs

The Department of Mathematical Sciences offers graduate programs of study in mathematics with specializations in the fields of algebra, analysis, topology, applied mathematics, probability and statistics, and actuarial science.

The programs of study at the master's level are designed to suit both the student intending to continue toward a PhD as well as the student who wishes to begin a professional career upon completion of the master's program.

The student may prepare for a career in teaching at the secondary or college level and for a career in research in the academic, industrial, government, or business communities.

Three options for the master's degree are offered: the standard mathematics option (A), the statistics option (B), and the actuarial science option (C). Students who plan to continue for a PhD degree with a focus on mathematics/statistics should elect an option from options A, B, C, or the dual master's degree option.

Dual Master's Degree Option

In addition to multiple options available for MS in mathematics, the Department of Mathematical Sciences at UWM and the Department of Technomathematics of Fachhochschule Aachen (FHA), Germany have recently created a Dual Master's Degree Program in Mathematics. The students enrolled in this program will be able to earn Master's degrees from both institutions upon completion of the common course requirements.

The program is designed in such a way that students typically will be able to complete all the course requirements within a two-year time period (one year at each institution). Within this program students can choose courses that will allow them to concentrate in the areas of Statistics, Numerical Analysis or General Mathematics. Complete information on the admission policy and graduation requirements, including sample schedules, is available at the Department of Mathematical Sciences web page http://uwm.edu/math/graduate/.

Admission Requirements

Application Deadlines

Application deadlines vary by program, please review the application deadline chart (http://uwm.edu/graduateschool/program-deadlines/) for specific programs. Other important dates and deadlines can be found by using the One Stop calendars (https://uwm.edu/onestop/dates-and-deadlines/).

Credits and Courses

An applicant must meet Graduate School requirements (http://uwm.edu/graduateschool/admission/) plus the following departmental requirements to be considered for admission to the program: completion of three semesters of undergraduate calculus and at least 18 credits of acceptable undergraduate preparation beyond calculus; these credits should include courses on probability and statistics equivalent to the sequence MTHSTAT 361/MTHSTAT 362, and courses on advanced calculus equivalent to the sequence MATH 523/MATH 524.

Applicants with deficiencies in probability and statistics may be admitted to the program but will be required to complete the sequence MTHSTAT 361/MTHSTAT 362. Applicants with calculus deficiencies may also be admitted to the program but will be required to complete the sequence MATH 523G/MATH 524G. Students are expected to make up deficiencies within four enrolled semesters; no course credits earned in making up deficiencies may count toward the degree credit requirement.

The minimum requirement is 30 graduate credits. Students must complete the following:

Code	Title	Credits
Select one of the following:		3-6
MATH 535G	Linear Algebra	
MATH 735 & MATH 736	Modern Algebra I and Modern Algebra II	
Select one of the following		6
MATH 723 & MATH 724	Introduction to Analysis I and Introduction to Analysis II	
MATH 823 & MATH 824	Theory of Functions of a Real Variable I and Theory of Functions of a Real Variable II	
MATH 783	Introduction to Probability Models	3
MTHSTAT 763	Regression Analysis	3
MTHSTAT 764	Time Series Analysis	3
MTHSTAT 871 & MTHSTAT 872	Mathematical Statistics I and Mathematical Statistics II	6
Select at least one other 560 or 760-level MthStat course, such as the following:		3
MTHSTAT 562G	Design of Experiments	
MTHSTAT 565G	Nonparametric Statistics	
MTHSTAT 766	Computational Statistics	
MTHSTAT 768	Multivariate Statistical Analysis	
Total Credits		**27-30**

Students who already have taken some of these courses as undergraduates, or equivalent courses at another institution, should choose alternatives from the following list, subject to the advisor's approval:

Code	Title	Credits
MthStat courses numbered 700 or above		
Statistics course offered by the Division of Biostatistics of the Medical College of Wisconsin		
MATH 413G	Introduction to Numerical Analysis	3
MATH 415G	Introduction to Scientific Computing	3
MATH 417G	Computational Linear Algebra	3

MATH 823 & MATH 824	Theory of Functions of a Real Variable I and Theory of Functions of a Real Variable II	6
MATH 827 & MATH 828	Theory of Functions of a Complex Variable I and Theory of Functions of a Complex Variable II	6
MATH 883 & MATH 884	Theory of Probability and Stochastic Calculus and Applications	6
ACTSCI 796 & ACTSCI 797	Actuarial Statistics I and Actuarial Statistics II	6

Thesis Option

Students have the option of writing a thesis, subject to the advisor's approval. Students who write a thesis are exempt from the Master's Proficiency Exam, and they earn 3 credits toward the degree by enrolling in MATH 890. Students who choose the thesis option must pass an oral defense of the thesis.

Additional Requirements

Major Professor as Advisor

The student must have a major professor to advise and supervise the student's studies as specified in Graduate School regulations. Each entering graduate student is assigned a temporary advisor by the Department Graduate Program Coordinator.

Master's Proficiency Exam

Students who do not complete the thesis option are required to pass a written comprehensive examination that tests basic knowledge of statistical theory and either mathematical analysis or algebra.

Time Limit

Students must complete all degree requirements with 5 years of initial enrollment.

Mathematics MS Learning Outcomes

Students graduating from the program will be able to:

1. **apply** advanced knowledge of a range of topics in Mathematics or related fields, in the context of the chosen MS option.
2. **apply** analytical and critical thinking skills required for the efficient use and understanding of the mathematical sciences.