

APPLIED AND COMPUTATIONAL MATHEMATICS, MS

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum degree requirements (<https://guide.wisc.edu/graduate/#requirements>) and policies (<https://guide.wisc.edu/graduate/#policies>), in addition to the program requirements listed below.

MAJOR REQUIREMENTS

MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	Yes

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

Evening/Weekend: Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW–Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

Requirements	Detail
Minimum Credit Requirement	30 credits
Minimum Residence Credit Requirement	16 credits
Minimum Graduate Coursework Requirement	24 credits must be graduate-level coursework. Refer to the Graduate School's Minimum Graduate Coursework (50%) Requirement Policy: https://policy.wisc.edu/library/UW-1244 (https://policy.wisc.edu/library/UW-1244/)
Overall Graduate GPA Requirement	3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement Policy: https://policy.wisc.edu/library/UW-1203 (https://policy.wisc.edu/library/UW-1203/)

Other Grade Requirements	None
Assessments and Examinations	None
Language Requirements	None

REQUIRED COURSES

Code	Title	Credits
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Students must complete 18 credits from the following Core categories. At least 6 credits must be completed from each category. At least two courses must be numbered 700 or higher.

Theory and Modeling 6

MATH 322	Applied Mathematical Analysis 2: Partial Differential Equations	
MATH 415	Applied Dynamical Systems, Chaos and Modeling	
MATH/ISYE/OTM/STAT 632	Introduction to Stochastic Processes	
MATH 703	Methods of Applied Mathematics 1	
MATH 704	Methods of Applied Mathematics-2	

Computational Methods 6

MATH/COMP SCI 513	Numerical Linear Algebra	
MATH/COMP SCI 514	Numerical Analysis	
MATH/COMP SCI 714	Methods of Computational Mathematics I	
MATH/COMP SCI 715	Methods of Computational Mathematics II	
MATH 717	Stochastic Computational Methods	

Mathematical Data Science 6

MATH 444	Graphs and Networks in Data Science	
MATH 535	Mathematical Methods in Data Science	
MATH 616	Data-Driven Dynamical Systems, Stochastic Modeling and Prediction	
MATH 717	Stochastic Computational Methods	
MATH 718	Randomized Linear Algebra and Applications	

Electives

Students must complete at least 12 additional credits from the lists above or below. At most 6 credits can be taken from List B. At most one MATH course can be taken in coursework numbered 800-899.

MATH/STAT 431	Introduction to the Theory of Probability	
MATH 519	Ordinary Differential Equations	
MATH 521	Analysis I	
MATH 522	Analysis II	
MATH 531	Probability Theory	

MATH/B M I/ BIOCHEM/ BMOLCHEM 609	Mathematical Methods for Systems Biology
MATH 619	Analysis of Partial Differential Equations
MATH 623	Complex Analysis
MATH 627	Introduction to Fourier Analysis
MATH 629	Introduction to Measure and Integration
MATH 635	An Introduction to Brownian Motion and Stochastic Calculus
MATH 705	Mathematical Fluid Dynamics
MATH 716	Ordinary Differential Equations
MATH 719	Partial Differential Equations
MATH 720	Partial Differential Equations
MATH 721	A First Course in Real Analysis
MATH 722	Complex Analysis
MATH 725	A Second Course in Real Analysis
MATH/STAT 733	Theory of Probability I
MATH/STAT 734	Theory of Probability II
MATH 735	Stochastic Analysis
MATH 801	Topics in Applied Mathematics
MATH/E C E/ STAT 888	Topics in Mathematical Data Science

List B

COMP SCI 300	Programming II
COMP SCI 400	Programming III
COMP SCI/E C E/ I SY E 524	Introduction to Optimization
COMP SCI/I SY E/ MATH/STAT 726	Nonlinear Optimization I
COMP SCI/I SY E/ MATH 730	Nonlinear Optimization II
COMP SCI/ E C E 760	Machine Learning
COMP SCI/ E C E 761	Mathematical Foundations of Machine Learning
MATH/ COMP SCI/I SY E/ STAT 525	Linear Optimization
STAT 615	Statistical Learning
STAT/MATH 709	Mathematical Statistics I
STAT/MATH 710	Mathematical Statistics II
STAT 771	Computational Statistics
STAT/ECON/ GEN BUS 775	Bayesian Statistics
STAT 849	Advanced Statistical Methods
L I S 461	Data and Algorithms: Ethics and Policy
E C E 742	Computational Methods in Electromagnetics

E C E/COMP SCI/ High Performance Computing for
E M A/E P/ Applications in Engineering
M E 759

Total Credits**30****Other Policy**

Students in this program may not take courses outside the prescribed curriculum without faculty advisor and program director approval. Students in this program cannot enroll concurrently in other undergraduate or graduate degree programs.