

# MATHEMATICS: FOUNDATIONS FOR RESEARCH, MA

## REQUIREMENTS

### MINIMUM GRADUATE SCHOOL REQUIREMENTS

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

### NAMED OPTION REQUIREMENTS

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

**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

Requirement	Detail
Minimum Credit Requirement	30 credits
Minimum Residence Credit Requirement	16 credits
Minimum Graduate Coursework Requirement	30 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: <a href="https://policy.wisc.edu/library/UW-1244">https://policy.wisc.edu/library/UW-1244</a> ( <a href="https://policy.wisc.edu/library/UW-1244/">https://policy.wisc.edu/library/UW-1244/</a> ).

Overall Graduate GPA Requirement	3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: <a href="https://policy.wisc.edu/library/UW-1203">https://policy.wisc.edu/library/UW-1203</a> ( <a href="https://policy.wisc.edu/library/UW-1203/">https://policy.wisc.edu/library/UW-1203/</a> ).
Other Grade Requirements	At least 12 credits from a specified list of 700 courses are required to be passed with grade B or higher.
Assessments and Examinations	None.
Language Requirements	No language requirements.

### REQUIRED COURSES

Code	Title	Credits
<b>(i) Core Courses: 12</b>		
Select four of the following:		
MATH 703	Methods of Applied Mathematics 1	
MATH 704	Methods of Applied Mathematics-2	
MATH/COMP SCI 714	Methods of Computational Mathematics I	
MATH/COMP SCI 715	Methods of Computational Mathematics II	
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 741	Abstract Algebra	
MATH 742	Abstract Algebra	
MATH 751	Introductory Topology I	
MATH 752	Introductory Topology II	
MATH 758	Introduction to Ergodic Theory and Dynamics	
MATH 761	Differentiable Manifolds	
MATH 770	Foundations of Mathematics	
MATH 771	Set Theory	
MATH 773	Computability Theory	
MATH 776	Model Theory	
<b>(ii) Four Mathematics courses numbered 600 or above passed with a grade of B or higher <sup>1</sup></b>		<b>12</b>
<b>(iii) Electives (numbered 500 or above)</b>		<b>6</b>
<i>Advanced Computer Science Course</i>		
Students must complete an advanced computer science course which involves substantial programming. The advanced computer science requirement can be counted as an elective. Below is a list of advanced computer science courses. Other courses require prior approval of the director of graduate studies. This requirement is waived for Math PhD students, provided two qualifying exams have been passed.		
COMP SCI 400	Programming III	
COMP SCI 536	Introduction to Programming Languages and Compilers	
COMP SCI 537	Introduction to Operating Systems	

COMP SCI 564	Database Management Systems: Design and Implementation
COMP SCI 704	Principles of Programming Languages
COMP SCI/ MATH 714	Methods of Computational Mathematics I
COMP SCI/ MATH 715	Methods of Computational Mathematics II
COMP SCI/ I SY E 719	Stochastic Programming
COMP SCI/I SY E/ MATH 730	Nonlinear Optimization II
<b>Total Credits</b>	<b>30</b>

<sup>1</sup> The graduate advisor may also approve to have courses numbered 500-599 count for this requirement (but typically no introductory courses such as MATH 521 Analysis I, MATH 541 Modern Algebra or MATH 551 Elementary Topology).