BACHELOR OF SCIENCE (BS) DEGREE WITH A MAJOR IN MATHEMATICS

Program Learning Outcomes for the BS Degree with a Major in Mathematics

Upon completing the BS degree with a major in Mathematics, students will be able to:

1. Achieve both practical and theoretical fluency in calculus and linear algebra.
2. Acquire a broad background at the undergraduate level in all the major areas of mathematics, including analysis, algebra, and geometry.
3. Learn to read and write proofs.

Requirements for the BS Degree with a Major in Mathematics

For general university requirements, see Graduation Requirements (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/). Students pursuing the BS degree with a major in Mathematics must complete:

- A minimum of 14-17 courses (42-51 credit hours), depending on course selection, to satisfy the major requirements.
- A minimum of 120 credit hours to satisfy degree requirements.
- A minimum of 11 courses (33 credit hours) taken at the 300-level or above.

Students receive advanced placement (AP) credit by achieving a score of 4 or 5 on the AP AB-level test or by achieving a score of 4 or 5 on the BC-level test. The credit is articulated as MATH 105 or MATH 105 and MATH 106. Entering students should enroll in the most advanced course commensurate with their background; advice is available from the mathematics faculty during Orientation Week and at other times.

The chair of the MATH department's undergraduate committee may modify requirements to meet the needs of specific advanced students. If a MATH course is repeatable for credit, the course may only be repeated once.

The courses listed below satisfy the requirements for this major. In certain instances, courses not on this official list may be substituted upon approval of the major's academic advisor or, where applicable, the department's Director of Undergraduate Studies. (Course substitutions must be formally applied and entered into Degree Works by the major's Official Certifier (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/).) Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Code	Title	Credit Hours
Total Credit Hours Required for the Major in Mathematics		42-51
Total Credit Hours Required for the BS Degree with a Major in Mathematics		120

Degree Requirements

Code	Title	Credit Hours
Core Requirements		
Single Variable Calculus		
MATH 101	SINGLE VARIABLE CALCULUS I [1]	3
or MATH 105	AP/OTH CREDIT IN CALCULUS I	
MATH 102	SINGLE VARIABLE CALCULUS II [1]	3
or MATH 106	AP/OTH CREDIT IN CALCULUS II	
Differential Equations		
Select 1 course from the following:		*3*
MATH 211	ORDINARY DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA	
MATH 220	HONORS ORDINARY DIFFERENTIAL EQUATIONS	
MATH 381	INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS	
MATH 423 / CMOR 405	PARTIAL DIFFERENTIAL EQUATIONS I	
Multivariable Calculus		
Select 1 from the following:		*3-6*
MATH 212	MULTIVARIABLE CALCULUS	
MATH 221 & MATH 222	HONORS CALCULUS III and HONORS CALCULUS IV	
MATH 232	HONORS MULTIVARIABLE CALCULUS	
MATH 322	INTRODUCTION TO ANALYSIS II [2]	
MATH 370	CALCULUS ON MANIFOLDS [3]	
Linear Algebra		
Select 1 course from the following:		*3*
MATH 221	HONORS CALCULUS III	
MATH 354	HONORS LINEAR ALGEBRA	
MATH 355	LINEAR ALGEBRA	
Real Analysis		
Select 2 courses from the following:		*6*
MATH 321	INTRODUCTION TO ANALYSIS I	
MATH 322	INTRODUCTION TO ANALYSIS II [2]	
MATH 331	HONORS ANALYSIS	
MATH 425	INTEGRATION THEORY	
Algebra		
Select 2 courses from the following:		*6*
MATH 356	ABSTRACT ALGEBRA I	
MATH 357	ABSTRACT ALGEBRA II	
MATH 463	ADVANCED ALGEBRA I	
Geometry and Manifolds		
Select 1 course from the following:		*3*
MATH 370	CALCULUS ON MANIFOLDS [3]	
MATH 401	DIFFERENTIAL GEOMETRY OF CURVES AND SURFACES	
MATH 402	DIFFERENTIAL GEOMETRY	
MATH 451	DIFFERENTIABLE MANIFOLDS	
MATH 452	RIEMANNIAN GEOMETRY	
Complex Analysis		
MATH 382	COMPUTATIONAL COMPLEX ANALYSIS	3

or MATH 427	COMPLEX ANALYSIS	
Topology		
Select 1 course from the following:		*3*
MATH 443	GENERAL TOPOLOGY	
MATH 444	GEOMETRIC TOPOLOGY	
MATH 445	ALGEBRAIC TOPOLOGY	
Elective Requirements		
Students must complete a minimum of 33 credit hours from departmental (MATH) course offerings at the 300-level or above. [4]		*33*
Total Credit Hours Required for the Major in Mathematics		**42-51**
Additional Credit Hours to Complete Degree Requirements *		38-47
University Graduation Requirements (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/) *		31
Total Credit Hours		**120**

Footnotes and Additional Information

* **Note:** University Graduation Requirements include 31 credit hours, comprised of Distribution Requirements (Groups I, II, and III), FWIS, and LPAP coursework. In some instances, courses satisfying FWIS or distribution requirements may additionally meet other requirements, such as the Analyzing Diversity (AD) requirement, or some of the student's declared major, minor, or certificate requirements. Additional Credit Hours to Complete Degree Requirements include general electives, coursework completed as upper-level, residency (hours taken at Rice), and/or any other additional academic program requirements.

1 Students may substitute a higher-level MATH course at the 200-level (or above), taken for at least 3 credit hours, for the MATH 101 and/or MATH 102 requirements.

2 MATH 322 cannot fulfill more than one requirement.

3 MATH 370 cannot fulfill more than one requirement.

4 The Elective Requirements may include courses at the upper-level (300-level or above) taken as Core Requirements and/or Elective coursework, for a minimum of 11 courses (33 credit hours) at the 300-level or above. At most, students can take any given course (3 credit hours) only once to fulfill major requirements. Additionally, at most 3 credit hours from research and supervised reading courses (such as MATH 479 or courses numbered MATH 490 through MATH 499) may fulfill Elective Requirements.

Policies for the BS Degree with a Major in Mathematics

Program Restrictions and Exclusions

Students pursuing the BS Degree with a Major in Mathematics should be aware of the following program restrictions:

- As noted in Majors, Minors, and Certificates (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/) under *Declaring Majors, Minors and Certificates*, students may not obtain both a BA and a BS in the same major. Students pursuing the BS Degree with a Major in Mathematics may not additionally pursue the BA Degree with a Major in Mathematics.
- As noted in Majors, Minors, and Certificates (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/), students may not major and minor in the same subject.

Transfer Credit

For Rice University's policy regarding transfer credit, see Transfer Credit (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/). Some departments and programs have additional restrictions on transfer credit. Requests for transfer credit must be approved for Rice equivalency by the designated transfer credit advisor for the appropriate academic department offering the Rice equivalent course (corresponding to the subject code of the course content). The Office of Academic Advising maintains the university's official list of transfer credit advisors (https://oaa.rice.edu/advising-network/transfer-credit-advisors/) on their website: https://oaa.rice.edu. Students are encouraged to meet with the applicable transfer credit advisor as well as their academic program director when considering transfer credit possibilities.

Additional Information

For additional information, please see the Mathematics website: https://math.rice.edu/.

Opportunities for the BS Degree with a Major in Mathematics

Academic Honors

The university recognizes academic excellence achieved over an undergraduate's academic history at Rice. For information on university honors, please see Latin Honors (https://ga.rice.edu/undergraduate-students/honors-distinctions/university/) (*summa cum laude*, *magna cum laude*, and *cum laude*) and Distinction in Research and Creative Work (https://ga.rice.edu/undergraduate-students/honors-distinctions/university/). Some departments have department-specific Honors awards or designations.

Additional Information

For additional information, please see the Mathematics website: https://math.rice.edu/.