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 (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 60 credit hours outside of major requirements.
- A minimum of 11 courses (33 credit hours) taken at the 300-level or above.

Students receive advanced placement credit for MATH 101 by achieving a score of 4 or 5 on the AP AB-level test and for MATH 101 and MATH 102 by achieving a score of 4 or 5 on the BC-level test. Students who have had calculus but have not taken the AP test may petition the department for a waiver of the calculus requirements. 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 official certifier). Students and their academic advisors should identify and clearly document the courses to be taken.

### Summary

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Credit Hours Required for the Major in Mathematics</td>
<td>42-51</td>
</tr>
<tr>
<td></td>
<td>Total Credit Hours Required for the BS Degree with a Major in Mathematics</td>
<td>120</td>
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</table>

### Degree Requirements

#### Core Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 101</td>
<td>SINGLE VARIABLE CALCULUS I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 102</td>
<td>SINGLE VARIABLE CALCULUS II</td>
<td>3</td>
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</tbody>
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#### Differential Equations

Select 1 from the following:

- MATH 211: ORDINARY DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA
- MATH 381: INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS
- MATH 423 / CAAM 423: PARTIAL DIFFERENTIAL EQUATIONS I

#### Multivariable Calculus

Select 1 from the following:

- MATH 212: MULTIVARIABLE CALCULUS
- MATH 221: HONORS CALCULUS III
- MATH 222: HONORS CALCULUS IV

#### Linear Algebra

Select 1 from the following:

- MATH 221: HONORS LINEAR ALGEBRA
- MATH 354: HONORS LINEAR ALGEBRA
- MATH 355: LINEAR ALGEBRA

#### Real Analysis

Select 2 from the following:

- MATH 321: INTRODUCTION TO ANALYSIS I
- MATH 322: INTRODUCTION TO ANALYSIS II
- MATH 331: HONORS ANALYSIS
- MATH 425: INTEGRATION THEORY

#### Algebra

- MATH 356: ABSTRACT ALGEBRA I
- MATH 463: ABSTRACT ALGEBRA II

#### Geometry and Manifolds

Select 1 from the following:

- MATH 370: CALCULUS ON MANIFOLDS
- MATH 401: DIFFERENTIAL GEOMETRY OF CURVES AND SURFACES
- MATH 402: DIFFERENTIAL GEOMETRY

#### Complex Analysis

- MATH 382: COMPUTATIONAL COMPLEX ANALYSIS
- MATH 427: COMPLEX ANALYSIS

#### Topology

Select 1 from the following:

- MATH 443: GENERAL TOPOLOGY
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<tr>
<td>MATH 444</td>
<td>GEOMETRIC TOPOLOGY</td>
</tr>
<tr>
<td>MATH 445</td>
<td>ALGEBRAIC TOPOLOGY</td>
</tr>
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</table>

Elective Requirements

Students must complete a minimum of 33 credit hours from departmental (MATH) course offerings at the 300-level or above.  

Total Credit Hours Required for the Major in Mathematics  
42-51

Additional Credit Hours to Complete BS Degree Requirements  
9-18

University Graduation Requirements (ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements)  
60

Total Credit Hours  
120

Footnotes and Additional Information

* Includes coursework completed as distribution credit, FWIS, LPAP, upper-level, residency (hours taken at Rice), 60 hours outside of the major (if applicable), and any additional academic program requirements. The “hours outside of the major” requirement may include all of the above university requirements.

1 In Fall 2017, the MATH department is offering an Honors version of this course, Honors Ordinary Differential Equations. Please see the MATH major advisor for details on course substitution, etc.

2 The Elective Requirements can include courses taken from the 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 1 course (3 credit hours) for any given course number to use toward the degree.

Policies for the BS Degree with a Major in Mathematics

Transfer Credit

For Rice University’s policy regarding transfer credit, see Transfer Credit (ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit). Some departments and programs have additional restrictions on transfer credit. The Office of Academic Advising maintains the university’s official list of transfer credit advisors on their website: http://oaa.rice.edu. Students are encouraged to meet with their academic program's transfer credit advisor when considering transfer credit possibilities.

Departmental Transfer Credit Guidelines

Students pursuing the major in Mathematics should be aware of the following departmental transfer credit guidelines:

- Requests for transfer credit will be considered by the program director (and/or the program’s official transfer credit advisor) on an individual case-by-case basis.

For additional information, please see the Mathematics website: http://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 (ga.rice.edu/undergraduate-students/honors-distinctions/university) (summa cum laude, magna cum laude, and