MATHEMATICS, B.S.

Mathematics is an excellent major for the student whose immediate objective is to acquire a strong liberal arts education. Graduates may go on to work as an actuary with insurance companies; as a data analyst with pharmaceutical, biotechnology, or health care companies; as a quality assurance specialist with engineering companies; or in government agencies such as FDA, EPA, NSA, or USDA.

The B.S. program is more technically oriented than the B.A. program. It provides solid preparation for work or study in mathematics or a related field. Students wanting to go to graduate school are encouraged to consider the Accelerated Degree Program (ADP) (p. 2) to earn a B.S. and M.A. in 5 years. Strong students can graduate with Disciplinary Honors (https://catalog.uncg.edu/arts-sciences/mathematics-statistics/#programstext).

An undergraduate degree in mathematics also provides excellent preparation for graduate studies in many areas, including actuarial sciences, computer science, economics, engineering, law, mathematics, operations research, and statistics. The major can be specialized to allow preparation for any of these goals.

Overall Requirements

- 120 credit hours, to include at least 36 credits at or above the 300 course level
- Students planning to pursue graduate study should contact their advisor as soon as possible to prepare a plan of study
- A minimum grade of C (2.0) is required for all CSC, MAT, and STA courses to count towards the major core and the concentration.

Degree Program Requirements

### Core Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 191</td>
<td>Calculus I (^1)</td>
<td>1</td>
</tr>
<tr>
<td>MAT 292</td>
<td>Calculus II</td>
<td></td>
</tr>
<tr>
<td>MAT 293</td>
<td>Calculus III</td>
<td></td>
</tr>
<tr>
<td>MAT 310</td>
<td>Elementary Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>MAT 394</td>
<td>Calculus IV</td>
<td></td>
</tr>
<tr>
<td>MAT 490</td>
<td>Senior Seminar in Mathematics</td>
<td></td>
</tr>
<tr>
<td>STA 290</td>
<td>Introduction to Probability and Statistical Inference</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Counts toward GEC GMT requirement.

### Concentrations

Students must select one of the concentrations as detailed following the major requirements.

- Advanced Mathematics
- Statistics

### Electives

Electives sufficient to complete the 120 credit hours required for degree.

### Advanced Mathematics Concentration Requirements

- A minimum grade of C (2.0) is required for all CSC, MAT, and STA courses to count towards the major core and the concentration.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 120</td>
<td>Introduction to Computer Programming for Non-Majors</td>
<td>3</td>
</tr>
<tr>
<td>CSC 130</td>
<td>Introduction to Computer Science</td>
<td></td>
</tr>
<tr>
<td>CSC 230</td>
<td>Elementary Data Structures and Algorithms</td>
<td></td>
</tr>
<tr>
<td>MAT 253</td>
<td>Discrete Mathematical Structures</td>
<td></td>
</tr>
<tr>
<td>MAT 311</td>
<td>Introduction to Abstract Algebra</td>
<td></td>
</tr>
<tr>
<td>MAT 390</td>
<td>Ordinary Differential Equations</td>
<td></td>
</tr>
<tr>
<td>MAT 395</td>
<td>Introduction to Mathematical Analysis</td>
<td></td>
</tr>
</tbody>
</table>

### Mathematical Sciences Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 427</td>
<td>Numerical Analysis and Computing</td>
<td>9</td>
</tr>
<tr>
<td>CSC 452</td>
<td>Theory of Computation</td>
<td></td>
</tr>
<tr>
<td>CSC 454</td>
<td>Algorithm Analysis / Design</td>
<td></td>
</tr>
</tbody>
</table>

### Interdisciplinary Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 291</td>
<td>General Physics I with Calculus</td>
<td>8</td>
</tr>
<tr>
<td>PHY 292</td>
<td>General Physics II with Calculus</td>
<td></td>
</tr>
<tr>
<td>CHE 111</td>
<td>General Chemistry I</td>
<td></td>
</tr>
<tr>
<td>&amp; CHE 112</td>
<td>General Chemistry I Laboratory</td>
<td></td>
</tr>
<tr>
<td>CHE 114</td>
<td>General Chemistry II</td>
<td></td>
</tr>
<tr>
<td>&amp; CHE 115</td>
<td>General Chemistry II Laboratory</td>
<td></td>
</tr>
<tr>
<td>BIO 111</td>
<td>Principles of Biology I</td>
<td></td>
</tr>
<tr>
<td>&amp; 111L</td>
<td>Principles of Biology I Laboratory</td>
<td></td>
</tr>
</tbody>
</table>
**Mathematics, B.S.**

**BIO 112 & 112L**  
Principles of Biology II and Principles of Biology II Laboratory

* The following courses are not eligible:
  - MAT 405 Foundations of Mathematics for Teaching I
  - MAT 406 Foundations of Mathematics for Teaching II
  - MAT 465 Student Teaching and Seminar-Secondary Mathematics

## Statistics Concentration Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

### Programming Course

Select one of the following:

- CSC 120  
  Introduction to Computer Programming for Non-Majors
- CSC 130  
  Introduction to Computer Science
- CSC 230  
  Elementary Data Structures and Algorithms

### Additional Statistics Courses

- STA 301  
  Statistical Methods
- STA 352  
  Statistical Inference

Select two additional STA courses at the 300 level or above.

### Advanced Statistics Courses

Select two STA courses at the 400 level.

### Mathematical Sciences Courses

Two additional courses chosen from the following:

- MAT or STA courses 300 level or above
- MAT 253  
  Discrete Mathematical Structures
- CSC 425  
  Bioinformatics
- CSC 427  
  Numerical Analysis and Computing

* The following courses are not eligible to count towards the Mathematical Sciences Courses requirement:
  - MAT 405 Foundations of Mathematics for Teaching I
  - MAT 406 Foundations of Mathematics for Teaching II
  - MAT 413 Historical Development of Mathematics
  - MAT 465 Student Teaching and Seminar-Secondary Mathematics

## Disciplinary Honors in Mathematics

**Requirements**

- A minimum of 12 credit hours as detailed below.
- UNC Greensboro cumulative GPA of 3.30 or better or, for transfer students, cumulative GPA of 3.30 or better from all prior institutions.
- A grade of B or higher in all course work used to satisfy the Honors requirement in Mathematics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>6-9</td>
</tr>
</tbody>
</table>

### Required

- MAT 493  
  Honors Work
- HSS 490  
  Senior Honors Project

Select two courses from the following:

- MAT 310  
  Elementary Linear Algebra
- MAT 311  
  Introduction to Abstract Algebra
- MAT 390  
  Ordinary Differential Equations
- MAT 395  
  Introduction to Mathematical Analysis

**To be taken before HSS 490**

**Recognition**

Receive a Certificate of Disciplinary Honors in Mathematics; have that accomplishment, along with the title of the Senior Honors Project, noted on the official transcript; and be recognized at a banquet held at the end of the spring semester.

**Honors Advisor**

Contact Richard Fabiano at fabiano@uncg.edu for further information and guidance about Honors in Mathematics. To apply: http://honorscollege.uncg.edu/forms/disc-application.pdf

## Accelerated B.A. or B.S. to M.A. in Mathematics

### Application and Admission

Qualified UNC Greensboro undergraduate students who are pursuing the B.A. or B.S. in Mathematics may apply for admission to the Accelerated Master’s Program (AMP) and the M.A. in Mathematics program. A cumulative undergraduate GPA of at least 3.5 based on at least 30 credits earned at UNC Greensboro is required. Applicants must have completed at least 60 credits and may not apply for admission to the AMP before the first semester of the junior year. All applicants must submit the Accelerated Master’s Program information when applying for admission to the M.A. in Mathematics, submitting all application materials excluding GRE scores.

### Courses

Admitted students may apply up to 12 credits of graduate-level course work toward completion of both the undergraduate and graduate degree, provided that they earn a grade of B (3.0) or better in the course and fulfill graduate-level requirements. The graduate courses the student will take within the Accelerated Master’s Program in Mathematics must be approved by the Graduate Program Director, must be specified on the Accelerated Master’s Program request, and must be chosen from among the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>
| MAT 695  
  Mathematical Analysis | 3 |
| MAT 696  
  Mathematical Analysis | 3 |
| STA 631  
  Introduction to Probability | 3 |
| STA 632  
  Introduction to Mathematical Statistics | 3 |
| STA 661  
  Advanced Statistics in the Behavioral and Biological Sciences I | 3 |
| STA 662  
  Advanced Statistics in the Behavioral and Biological Sciences II | 3 |

Please consult with an advisor to determine how the courses taken at the graduate level will meet requirements in the bachelor’s degree program. All degree requirements for the M.A. in Mathematics remain the same.