# 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 (p. 2).

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

### University Requirements

- General Education Requirements (MAC)

### College of Arts and Sciences Additional Requirements (CIC)

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## Major Requirements

### Core Courses

- MAT 310 Elementary Linear Algebra
- MAT 490 Senior Seminar in Mathematics
- STA 290 Introduction to Probability and Statistical Inference

### Calculus Sequence

**Select one of the two calculus sequences below:**

- **Four three-credit hour courses**
  - MAT 293 Calculus III
  - MAT 290 Calculus II
  - MAT 291 Calculus I

### Additional Mathematics Courses

**Two MAT courses at the 400-level. At least one of which must be chosen from the following:**

- MAT 450 Introductory Complex Analysis
- MAT 422 Intro Functional Analysis
- MAT 425 Intermediate Math Analysis

### Mathematical Sciences Courses

**Select three from the following:**

- MAT or STA courses 300 level or above
- CSC 427 Numerical Analysis and Computing
- CSC 452 Theory of Computation
- CSC 454 Algorithm Analysis / Design

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## 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>MAT 394</td>
<td>Calculus IV</td>
<td></td>
</tr>
<tr>
<td>MAT 196</td>
<td>Calculus A</td>
<td></td>
</tr>
<tr>
<td>MAT 296</td>
<td>Calculus B</td>
<td></td>
</tr>
<tr>
<td>MAT 396</td>
<td>Calculus C</td>
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</tr>
</tbody>
</table>

* If you need to take a combination of courses from both sequences contact your advisor.

## Disciplinary Honors

Students planning to pursue graduate study should contact their advisor as soon as possible to prepare a plan of study.

## Programming Course

**Select one from 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 Mathematics Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<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

**Select three from the following:**

- MAT or STA courses 300 level or above
- CSC 427 Numerical Analysis and Computing
- CSC 452 Theory of Computation
- CSC 454 Algorithm Analysis / Design

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## Interdisciplinary Courses

**Choose one of the subject options below**

### Biology

- BIO 111 Principles of Biology I
  & 111L and Principles of Biology I Laboratory
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>MAT 493</td>
<td>Honors Work *</td>
<td>6-9</td>
</tr>
<tr>
<td>HSS 490</td>
<td>Senior Honors Project</td>
<td></td>
</tr>
</tbody>
</table>

Select two courses from the following: 6

- 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

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.S. in Applied Statistics 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.S. in Applied Statistics.

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 Applied Statistics must be approved by the Graduate Program Director, must be specified on the Accelerated Master’s Program request, and must be selected from the following list.

<table>
<thead>
<tr>
<th>Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>STA 602</td>
<td>Statistical Methods for Data Analytics</td>
<td>3</td>
</tr>
<tr>
<td>STA 606</td>
<td>Solving Problems with Data Analytics</td>
<td>3</td>
</tr>
</tbody>
</table>
STA 631  Introduction to Probability  3
STA 632  Introduction to Mathematical Statistics  3

Please consult with your undergraduate advisor to determine how the courses taken at the graduate level will meet requirements in the bachelor’s degree program. All requirements for the M.S. in Applied Statistics remain the same.