MATHEMATICS, B.A.

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.A. program is more flexible than the B.S. program. It allows one to specialize in mathematics and at the same time either to follow a broad liberal arts program or to specialize in a second area (possibly even taking a second major). Students wanting to go to graduate school are encouraged to consider the Accelerated Degree Program (ADP) to earn a B.A. and M.A. in 5 years. Strong students can graduate with Disciplinary Honors.

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

Degree Program Requirements

University Requirements
- General Education Requirements (MAC)

College of Arts and Sciences Additional Requirements

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

Concentrations
- General Mathematics
- Health Informatics
- Statistics

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

General 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.

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 Mathematics Courses
- MAT 253 Discrete Mathematical Structures
- MAT 311 Introduction to Abstract Algebra
- MAT 390 Ordinary Differential Equations
- MAT 395 Introduction to Mathematical Analysis

Advanced Mathematics Courses
- Select one MAT course at the 400 level.*

Health Informatics 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.

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

General 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.

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 Mathematics Courses
- MAT 253 Discrete Mathematical Structures
- MAT 311 Introduction to Abstract Algebra
- MAT 390 Ordinary Differential Equations
- MAT 395 Introduction to Mathematical Analysis

Advanced Mathematics Courses
- Select one MAT course at the 400 level.*

* The following courses are not eligible:
  - MAT 405
  - MAT 406
  - MAT 465

Health Informatics 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.
### Statistics 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>STA 352</td>
<td>Statistical Inference</td>
<td></td>
</tr>
<tr>
<td>MAT 253</td>
<td>Discrete Mathematical Structures</td>
<td></td>
</tr>
<tr>
<td>MAT 390</td>
<td>Ordinary Differential Equations</td>
<td></td>
</tr>
<tr>
<td>STA 440</td>
<td>SAS System Statistical Analysis</td>
<td></td>
</tr>
</tbody>
</table>

#### Advanced Mathematics Courses

**Select one of the following:**

- MAT 427 Numerical Methods
- MAT 451 Topological Data Analysis
- STA 442 Statistical Computing
- STA 465 Analysis of Survival Data
- STA 481 Introduction to Design of Experiments

### Computing Courses

- CSC 330 Advanced Data Structures
- CSC 330 (Select one of the two introductory computer science sequences)
  - CSC 120 Introduction to Computer Programming for Non-Majors
  - CSC 220 and Elementary Data Structures - A Transition
  - CSC 130 Introduction to Computer Science
  - CSC 230 and Elementary Data Structures and Algorithms
- CSC 405 Data Science
- CSC 410 Big Data and Machine Learning
- CSC 416 Digital Image Processing
- CSC 425 Bioinformatics
- CSC 471 Principles of Database Systems

### Health Sciences Courses

- BIO 111 Principles of Biology I
  - 111L and Principles of Biology I Laboratory
- CHE 111 General Chemistry I
  - CHE 112 and General Chemistry I Laboratory
- CHE 114 General Chemistry II
  - CHE 115 and General Chemistry II Laboratory
- HEA 308 Introduction to Public Health

### 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:**

- 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 from two out of the following four choices:
Mathematics, B.A.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 695</td>
<td>Mathematical Analysis &amp; MAT 696 and Mathematical Analysis</td>
<td>6</td>
</tr>
<tr>
<td>STA 631 &amp; STA 632</td>
<td>Introduction to Probability and Introduction to Mathematical Statistics</td>
<td>6</td>
</tr>
<tr>
<td>Two courses selected from 600-level or higher MAT courses *</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>STA 602</td>
<td>Statistical Methods for Data Analytics</td>
<td>6</td>
</tr>
<tr>
<td>STA 622</td>
<td>Complex Data Analysis</td>
<td></td>
</tr>
<tr>
<td>STA 645</td>
<td>Nonparametric Statistics</td>
<td></td>
</tr>
<tr>
<td>STA 670</td>
<td>Categorical Data Analysis</td>
<td></td>
</tr>
<tr>
<td>STA 671</td>
<td>Multivariate Analysis</td>
<td></td>
</tr>
</tbody>
</table>


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.