The Master of Arts in Mathematics degree has six concentrations: Actuarial Mathematics, Data Analytics, Mathematics, Mathematical Foundations of Data Science, Mathematical Statistics, and Teaching College Mathematics. The programs provide advanced training in these areas. Although it is often a terminal degree, the M.A. degree can also be viewed as a natural step towards a Ph.D. degree.

Students who plan to continue to the Ph.D. in Computational Mathematics (https://catalog.uncg.edu/arts-sciences/mathematics-statistics/computational-mathematics-phd/) program are urged to elect the concentration in Mathematics. They may then use the doctoral qualifying examinations to satisfy the comprehensive examination requirement in the non-thesis option for the M.A. degree.

For information regarding deadlines and requirements for admission, please see the Guide to Graduate Admissions (https://grs.uncg.edu/prospective/guide/).

In addition to the application materials required by the Graduate School, applicants must submit a 500-700 word personal statement to be considered for admission.

## Degree Program Requirements

### Required: 30 credit hours

### Actuarial Mathematics Concentration

#### Required: 30 credit hours

The M.A. in Mathematics with a concentration in Actuarial Mathematics provides students wishing to pursue a career in actuarial science a solid foundation in Applied Probability and Statistical Models and their applications in the area of actuarial science. It is designed to help students pass the preliminary actuarial exams while providing educational experiences related to the actuarial field. Students will be encouraged to seek internship opportunities during the summer. The concentration requires 30 credit hours and is offered with a project. At least 15 credits must be at the 600-level or above.

The target student population for this program will be students with a bachelor's degree in mathematics, statistics, economics, finance, or a related field who want to pursue an actuarial industry to advance their career.

### Code | Title | Credit Hours
---|---|---
STA 631 | Introduction to Probability | 3
STA 632 | Introduction to Mathematical Statistics | 3
STA 655 | Applied Probability Models | 3
MAT 686 | Financial Math for Actuaries | 3

### Elective Courses (15-18 credits)

**Actuarial Exam and Applied Statistics Courses**

Select at least 9 credits from the following: 9

- STA 635 Theory of Linear Regression
- STA 642 Statistical Computing
- STA 665 Analysis of Survival Data
- STA 691 Actuarial Exam Preparation Seminar

### Other Applied Statistics Courses

Select at most 6 credits from any other 600-level STA courses or the following: 6

- STA 670 Categorical Data Analysis
- STA 671 Multivariate Analysis
- STA 682 Theory of Time Series

### Data Analytics Concentration

#### Required: 30 credit hours

The concentration in Data Analytics provides students with advanced analytical training to develop their ability to draw insights from big data, including: data collection, preparation and integration, statistical methods and modeling, and other techniques for analyzing complex data. The program is highly applied in nature, integrating project-based learning, simulations, case studies, and specific electives addressing the analytical needs of various industry sectors. The concentration requires a minimum of 30 credit hours including either a project (3 credits) or thesis (6 credits) option.

### Code | Title | Credit Hours
---|---|---
STA 631 | Introduction to Probability | 3
STA 632 | Introduction to Mathematical Statistics | 3
STA 642 | Statistical Computing | 3
STA 673 | Statistical Linear Models I | 3
STA 703 | Topics in High Dimensional Data Analysis | 3

### Analytics Applications (9-12 credits)

Select at least two courses (6 credits) from the following: 6

- STA 645 Nonparametric Statistics
- STA 661 Advanced Statistics in the Behavioral and Biological Sciences I
- STA 662 Advanced Statistics in the Behavioral and Biological Sciences II
- STA 665 Analysis of Survival Data
- STA 670 Categorical Data Analysis
- STA 671 Multivariate Analysis
- STA 674 Statistical Linear Models II

### Total Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>STA 698</td>
<td>Project in Statistics</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

* Excluding the 600-level STA courses listed above and STA 651, STA 652, STA 667, STA 668, STA 690, and STA 699.

** Each student is required to complete a project under the direction of an advisor chosen by the Graduate Program Director in consultation with the student. 3 credits of STA 698 Project in Statistics will be included in the 30 credits required for the concentration.
A student may pass a written comprehensive examination of their program. Please consult with the Graduate Program Director for information concerning the comprehensive examination. Under this option, 30 credits of course work is required.

Mathematics Concentration

Required: 30 credit hours

The Mathematics concentration offers a thesis option, a project option and a comprehensive exam option. Each option requires 30 credit hours.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT Electives (6-24 credits)</td>
<td>Select 6-24 credits of electives from 600-level or higher MAT courses</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6-24</td>
</tr>
<tr>
<td>Interdisciplinary Electives (0-6 Credits)</td>
<td>Select up to 6 credits of electives from 600-level or higher CSC or STA 0-6 courses</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0-6</td>
</tr>
<tr>
<td>Thesis, Project, or Comprehensive Exam (Capstone Experience) (6, 3, or 0 credits)</td>
<td>Select one of the following options:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6, 3, or 0</td>
</tr>
<tr>
<td>Thesis Option (6 credits)</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Project Option (3 credits)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Comprehensive Exam Option (0 credits)</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

1 A student may prepare a thesis based on the investigation of a topic in statistics. A thesis director will be appointed by the Department Head after consultation with the student and the Graduate Program Director. Students will include 6 credits of thesis (STA 699) or 3 credits of STA 698 Project in Statistics and 3 credits of STA 699 in the 30 credits required for the concentration. An oral examination on the thesis is required.

2 A student who does not prepare a thesis must complete a project under the direction of an advisor chosen by the Graduate Program Director in consultation with the student. 3 credits of STA 698 Project in Statistics will be included in the 30 credits required for the concentration.

3 A student may pass a written comprehensive examination of their program. Please consult with the Graduate Program Director for information concerning the comprehensive examination. Under this option, 30 credits of course work is required.

Thesis, Project, or Comprehensive Exam (Capstone Experience)

Each student must elect to complete a thesis, project, or comprehensive exam. Each option requires 30 credits total.

Thesis Option (6 credits)

A student may prepare a thesis based on the investigation of a topic in statistics. A thesis director will be appointed by the Department Head after consultation with the student and the Graduate Program Director. Students will include 6 credits of thesis (STA 699) or 3 credits of STA 698 Project in Statistics and 3 credits of STA 699 in the required 30 credits. An oral examination on the thesis is required.

Project Option (3 credits)

A student who does not prepare a thesis must complete a project under the direction of an advisor chosen by the Graduate Program Director in consultation with the student. 3 credits of STA 698 Project in Statistics will be included in the 30 credits required for the concentration.

Comprehensive Exam Option (0 credits)

A student may pass a written comprehensive examination of their program. Please consult with the Graduate Program Director for information concerning the comprehensive examination.
Thesis, Project, or Comprehensive Examination (Capstone Experience)

**Thesis Option (6 credits)**
A student may prepare a thesis based on the investigation of a topic in mathematics. A thesis director will be appointed by the Department Head after consultation with the student and the Graduate Program Director. Students may include up to 6 credits of thesis (MAT 699) in the 30 credits required for the concentration. An oral examination on the thesis is required.

**Project Option (3 credits)**
A student may prepare a project based on in-depth investigation of a topic in mathematics. A project director will be appointed by the Department Head after consultation with the student and the Graduate Program Director. Students may include 3 credits of project (MAT 687) in the 30 credits required for the concentration. A written report and an oral examination on the project are required.

**Comprehensive Examination Option (0 credits)**
A student who does not prepare a thesis must take 30 credits of course work and pass a written comprehensive examination of their program. Please consult with the Graduate Program Director for information concerning the comprehensive examination.

### Mathematical Foundations of Data Science Concentration

**Required: 30 credit hours**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 651</td>
<td>Topological Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MAT 653</td>
<td>Mathematical Data Science I: Foundations</td>
<td>3</td>
</tr>
<tr>
<td>MAT 654</td>
<td>Mathematical Data Science II: Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>STA 622</td>
<td>Complex Data Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

**Electives (12-15 credits)**
Select 12-15 credits of elective courses * 12-15

**Capstone Experience (6 or 3 credits)**
Select one of the following options: 6, 3, or 0

- **Thesis Option (6 credits)**
  - MAT 699 Thesis
  - STA 699 Thesis

- **Project Option (3 credits)**
  - MAT 687 Project in Mathematics
  - STA 698 Project in Statistics

**Total Credit Hours** 30


### Mathematical Statistics Concentration

**Required: 30 credit hours**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>STA 631</td>
<td>Introduction to Probability</td>
<td>3</td>
</tr>
<tr>
<td>or STA 651</td>
<td>Mathematical Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STA 632</td>
<td>Introduction to Mathematical Statistics</td>
<td>3</td>
</tr>
<tr>
<td>or STA 652</td>
<td>Mathematical Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STA 635</td>
<td>Theory of Linear Regression</td>
<td>3</td>
</tr>
<tr>
<td>STA 673</td>
<td>Statistical Linear Models I</td>
<td>3</td>
</tr>
</tbody>
</table>

**Electives (12-18 credits)**
Select 12-18 credits of elective courses from MAT and STA 600-level or higher courses

**Capstone Experience (6, 3, or 0 credits)**
Select one of the following options: 6, 3, or 0

- **Thesis Option (6 credits)**
  - STA 699 Thesis

- **Project Option (3 credits)**
  - STA 698 Project in Statistics

- **Area Exams Option (0 credits)**

**Total Credit Hours** 30


### Teaching College Mathematics Concentration

**Required: 30 credit hours**

The concentration in Teaching College Mathematics is intended for students wishing to pursue a career in teaching at the community college level. This 30 credit hour concentration is offered with a project option or an exam option. At least half of the required credits (15 out of the 30) must be taken at the 600-level or above. Candidates must complete at least 18 credits of graduate course work with an MAT prefix. The concentration has three components: The Mathematics and Statistics core courses; Pedagogy, Educational Research, and Higher Education; and the Capstone Experience (Project or Exam).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 691</td>
<td>Abstract Algebra I</td>
<td>3</td>
</tr>
<tr>
<td>&amp; MAT 692</td>
<td>and Abstract Algebra II</td>
<td>3</td>
</tr>
<tr>
<td>MAT 695</td>
<td>Mathematical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>&amp; MAT 696</td>
<td>and Mathematical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MAT 727</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>&amp; MAT 728</td>
<td>and Numerical Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>STA 631</td>
<td>Introduction to Probability</td>
<td>3</td>
</tr>
<tr>
<td>&amp; STA 632</td>
<td>and Introduction to Mathematical Statistics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Mathematics and Statistics Core Courses (18 credits)**
Select at least 18 credits from graduate-level MAT or STA courses, including at least one two-semester sequence from the following: 18

- MAT 601 Seminar in the Teaching of Mathematics I 1

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* With prior approval of the Graduate Program Director. At least 9 credits must be selected from MAT and STA graduate courses. At most, 6 credits may be selected from interdisciplinary courses in CSC, ECO, ERIM, IAC, IAF, IAL, and ISM.
Select 6-9 credits from the following:

- MAT 503 Problem Solving in Mathematics
- MAT 513 Historical Development of Mathematics
- STA 661 Advanced Statistics in the Behavioral and Biological Sciences I
- STA 662 Advanced Statistics in the Behavioral and Biological Sciences II
- ERM 605 Educational Measurement and Evaluation
- ERM 667 Foundations of Educational Measurement Theory
- HED 602 Student Development Theory in Higher Education

Project or Comprehensive Exam (Capstone Experience) (3 or 0 credits)

Select one of the following options:

- Project Option (3 credits)
  - MAT 687 Project in Mathematics
  - or STA 698 Project in Statistics

- Comprehensive Exam Option (0 credits)

Total Credit Hours: 30

1. Excluding MAT 503, MAT 513, MAT 601, MAT 603, MAT 699, and STA 699.
2. Students who select the project option must prepare a project on the investigation of a topic in mathematics or statistics. A project director will be appointed by the Department Head in consultation with the students the Graduate Program Director. Candidates may include up to 3 credits of MAT 687 or STA 698 in the required total for the concentration.
3. A student who does not prepare a project must pass a written comprehensive examination of their program. Please consult with the Graduate Program Director for information concerning the comprehensive examination.

**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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 695 &amp; MAT 696</td>
<td>Mathematical Analysis and Mathematical Analysis</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 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:</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>STA 602</td>
<td>Statistical Methods for Data Analytics</td>
<td></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.

**M.A. Doctoral Track**

The M.A. Doctoral Track offers exceptionally well-qualified applicants the opportunity to gain admission to the master's and doctoral programs simultaneously. This program is designed for students who would like to obtain their M.A. and then proceed directly to the Ph.D. program. Students accepted into the M.A Doctoral Track must fulfill all requirements for the M.A. and the Ph.D. and will earn both degrees. Students not accepted into the M.A. Doctoral Track may still be accepted into the M.A. only program.