COMPUTER SCIENCE, M.S.

The M.S. in Computer Science requires 30 credit hours with at least 24 credits in computer science (CSC) courses. Three options for the capstone experience are offered: comprehensive examination, project, or thesis. Optional concentrations in Data Science and Big Data and in Healthcare and Artificial Intelligence are available for Computer Science M.S. students.

For information regarding deadlines and requirements for admission, please see https://grs.uncg.edu/programs/.

Degree Program Requirements

Required: 30 credit hours

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 654</td>
<td>Algorithm Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>Select one course (3 credits) from the following:</td>
<td></td>
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</tr>
<tr>
<td>CSC 652</td>
<td>Theory of Computation</td>
<td>3</td>
</tr>
<tr>
<td>CSC 656</td>
<td>Foundations of Computer Science</td>
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<tr>
<td>Select one course (3 credits) from the following:</td>
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<tr>
<td>CSC 640</td>
<td>Software Engineering</td>
<td>3</td>
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<tr>
<td>CSC 662</td>
<td>Principles of Operating Systems</td>
<td></td>
</tr>
<tr>
<td>CSC 671</td>
<td>Advanced Database Systems</td>
<td></td>
</tr>
<tr>
<td>CSC 677</td>
<td>Principles of Computer Networks</td>
<td></td>
</tr>
<tr>
<td>Track Courses (12 credits)</td>
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<tr>
<td>Select four courses (12 credits) from one of the following tracks:</td>
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<tr>
<td>Foundation and Algorithms Track</td>
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<tr>
<td>CSC 639</td>
<td>Introduction to Compiler Design</td>
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<tr>
<td>CSC 652</td>
<td>Theory of Computation</td>
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<td>Foundations of Computer Science</td>
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<tr>
<td>CSC 685</td>
<td>Modern Cryptography</td>
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<tr>
<td>STA 631</td>
<td>Introduction to Probability</td>
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<tr>
<td>STA 651</td>
<td>Mathematical Statistics</td>
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<tr>
<td>Data Science and Big Data Track</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSC 605</td>
<td>Data Science</td>
<td></td>
</tr>
<tr>
<td>CSC 607</td>
<td>Network Analysis</td>
<td></td>
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<tr>
<td>CSC 610</td>
<td>Big Data and Machine Learning</td>
<td></td>
</tr>
<tr>
<td>CSC 616</td>
<td>Digital Image Processing</td>
<td></td>
</tr>
<tr>
<td>CSC 625</td>
<td>Bioinformatics</td>
<td></td>
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<tr>
<td>CSC 629</td>
<td>Artificial Intelligence</td>
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<td>CSC 671</td>
<td>Advanced Database Systems</td>
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<tr>
<td>CSC 672</td>
<td>Database System Architecture</td>
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<td>CSC 677</td>
<td>Principles of Computer Networks</td>
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<tr>
<td>STA 631</td>
<td>Introduction to Probability</td>
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<tr>
<td>STA 651</td>
<td>Mathematical Statistics</td>
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<tr>
<td>Systems and Networks Track</td>
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<tr>
<td>CSC 607</td>
<td>Network Analysis</td>
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<tr>
<td>CSC 629</td>
<td>Artificial Intelligence</td>
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<tr>
<td>CSC 640</td>
<td>Software Engineering</td>
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</tr>
<tr>
<td>CSC 642</td>
<td>Human-Computer Interface Development</td>
<td></td>
</tr>
<tr>
<td>CSC 661</td>
<td>Principles of Computer Architecture</td>
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</tbody>
</table>

| Electives (3-6 credits) | | |
| Select 3-6 credits of electives from other 600- or 700-level CSC courses | 3-6 |

| Capstone Experience (0-6 credits) | | |
| Select one of the following options: | 0-6 |
| Thesis (6 credits) | | |
| CSC 699 | Thesis                                      |              |
| Project (3-6 credits) | | |
| CSC 698 | Project in Computer Science                 |              |
| Comprehensive Examination (0 credits) | | |
| Complete a written examination on the program of study | | |

* Students in the Data Science and Big Data Concentration must take CSC 605, CSC 610, and CSC 671 as part of their concentration requirements.

** With the prior approval of the Graduate Program Director. A number of selected courses from other departments are also available; interested students should contact the Graduate Program Director.

Thesis, Project, or Comprehensive Examination (Capstone Experience)

Each candidate may elect to prepare a thesis, prepare a project, or pass a comprehensive examination on the program of course work.

Thesis
The candidate may prepare a thesis based on the investigation of a topic in computer science. A thesis director will be appointed by the Department Head after consultation with the student and the Graduate Program Director. The writing of a thesis requires the scholarly exposition and documentation of a substantial problem. In some cases, this may lead to a new solution to the problem and to original results. While writing the thesis, candidates may include up to 6 credits of CSC 699 Thesis in the required 30 credits for the program. An oral examination on the thesis is required.

Project
The candidate may prepare a project (theoretical or programmed) based on a topic in computer science. The project may be work-related. A project director will be appointed by the Department Head after consultation with the student and the Graduate Program Director. The preparation of a project requires a description of the problem and documentation of any software products or description of theoretical solutions. While preparing the project, candidates may include 3 to 6 credits of CSC 698 Project in Computer Science in the required 30 credits for the program. An oral examination on the project is required.

Comprehensive Examination
A candidate may elect to pass a written comprehensive examination on the program of study. Please consult with the Graduate Program Director for information concerning the comprehensive examination.
# Data Science and Big Data Concentration

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>Core Courses (12 credits)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSC 605</td>
<td>Data Science</td>
<td>3</td>
</tr>
<tr>
<td>CSC 610</td>
<td>Big Data and Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>CSC 654</td>
<td>Algorithm Analysis and Design</td>
<td>3</td>
</tr>
<tr>
<td>CSC 671</td>
<td>Advanced Database Systems</td>
<td>3</td>
</tr>
<tr>
<td><strong>Elective Courses (3 credits)</strong></td>
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<tr>
<td>Select one course (3 credits) from the following:</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>CSC 607</td>
<td>Network Analysis</td>
<td></td>
</tr>
<tr>
<td>CSC 616</td>
<td>Digital Image Processing</td>
<td></td>
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<tr>
<td>CSC 617</td>
<td>Deep Learning in Computer Vision</td>
<td></td>
</tr>
<tr>
<td>CSC 625</td>
<td>Bioinformatics</td>
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<tr>
<td>CSC 629</td>
<td>Artificial Intelligence</td>
<td></td>
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<tr>
<td>CSC 674</td>
<td>Principles of Data Mining</td>
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<tr>
<td>STA 635</td>
<td>Theory of Linear Regression</td>
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<tr>
<td>STA 661</td>
<td>Advanced Statistics in the Behavioral and Biological Sciences I</td>
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<tr>
<td>STA 682</td>
<td>Theory of Time Series</td>
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<tr>
<td><strong>Total Credit Hours</strong></td>
<td>15</td>
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</table>

* A grade of B+ or higher is required for CSC 631 or IAH 631 to qualify for the concentration.

# Healthcare and Artificial Intelligence Concentration

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td><strong>Core Courses (9 credits)</strong></td>
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<tr>
<td>CSC 630</td>
<td>Fundamentals of Health Informatics</td>
<td>3</td>
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<tr>
<td>or IAH 630</td>
<td>Fundamentals of Health Informatics</td>
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<tr>
<td>CSC 631</td>
<td>Artificial Intelligence in Healthcare</td>
<td>3</td>
</tr>
<tr>
<td>or IAH 631</td>
<td>Artificial Intelligence in Healthcare</td>
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</tr>
<tr>
<td>CSC 632</td>
<td>Ethics and Intellectual Property for Informatics and Analytics</td>
<td>3</td>
</tr>
<tr>
<td>or IAL 632</td>
<td>Ethics and Intellectual Property for Informatics and Analytics</td>
<td></td>
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<tr>
<td><strong>Elective Courses (6 credits)</strong></td>
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</tr>
<tr>
<td>Select one course (3 credits) from the following:</td>
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<tr>
<td>CSC 605</td>
<td>Data Science</td>
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<td>CSC 617</td>
<td>Deep Learning in Computer Vision</td>
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<tr>
<td>CSC 626</td>
<td>Advanced Bioinformatics</td>
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<td>CSC 674</td>
<td>Principles of Data Mining</td>
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<tr>
<td>CSC 681</td>
<td>Principles of Computer Security</td>
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</tr>
<tr>
<td>CSC 687</td>
<td>Network Security</td>
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</tr>
<tr>
<td><strong>Health and Human Sciences or Nursing Courses (3 credits)</strong></td>
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<tr>
<td>Select one course (3 credits) from the following:</td>
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<tr>
<td>HEA 601</td>
<td>Foundations of Public Health</td>
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<tr>
<td>HEA 602</td>
<td>Epidemiology Methods</td>
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</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td>15</td>
<td></td>
</tr>
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</table>

# Accelerated B.S. to M.S. in Computer Science

**Application and Admission**

Qualified UNC Greensboro undergraduate students who are pursuing the Bachelor of Science (B.S.) in Computer Science may apply for admission to the Accelerated Master’s Program (AMP). 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. Applicants will not be required to take the GRE. All applicants must complete the Accelerated Master’s Program information along with their application for admission to the graduate degree program.

**Courses**

Admitted students may apply the following 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:

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<td>CSC 662</td>
<td>Principles of Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>CSC 677</td>
<td>Principles of Computer Networks</td>
<td>3</td>
</tr>
</tbody>
</table>

Please consult with an advisor to determine how the course taken at the graduate level will meet requirements in the bachelor's degree program. All degree requirements for the M.S. in Computer Science remain the same.