

# COMPUTER SCIENCE, B.S.

The courses in the Computer Science Department are designed to teach the foundations of computing rather than a particular technology, so that the student is prepared to adapt to changing technology. Students are exposed to various programming languages and computing systems.

The job market in computer science is strong. A student completing a bachelor's degree with a strong academic record can expect job offers as a systems programmer or analyst, applications programmer, systems support staff member, technical staff member, or similar positions. The undergraduate curriculum has also been designed to prepare students for graduate studies (master's and doctoral degrees) in computer science. Qualified students who have an interest in research will have opportunities to participate in projects with department faculty during undergraduate or graduate studies.

In addition to the regular B.S. program, students may pursue a concentration in Data Science and Big Data, which is designed to provide Computer Science B.S. students with key knowledge of appropriate theories, algorithms, and technologies, towards development of analytical systems/models for disparate, complex, and small/large scale datasets. Students completing this concentration will have learned skills necessary to tackle a wide variety of data-focused scientific, social, and environmental challenges.

Because computer science courses change rapidly, it is recommended that the sequence CSC 130, CSC 230, CSC 330 be completed within 4 consecutive semesters.

The B.S. degree in Computer Science program is accredited by the Computing Accreditation Commission of ABET (<http://www.abet.org>).

## Overall Requirements

- 120 credit hours, to include at least 36 credits at or above the 300 course level
- Students must maintain a grade point average of at least 2.0 in the core courses, required electives, and required supporting discipline courses.

## Degree Program Requirements

Code	Title	Credit Hours
University Requirements ( <a href="https://catalog.uncg.edu/academic-regulations-policies/undergraduate-requirements/undergraduate-degrees-and-degree-requirements/">https://catalog.uncg.edu/academic-regulations-policies/undergraduate-requirements/undergraduate-degrees-and-degree-requirements/</a> )		
General Education Requirements (MAC) ( <a href="https://catalog.uncg.edu/academic-regulations-policies/undergraduate-requirements/general-education-program/#generaleducationcorerequirementstext">https://catalog.uncg.edu/academic-regulations-policies/undergraduate-requirements/general-education-program/#generaleducationcorerequirementstext</a> )		
College of Arts and Sciences Additional Requirements (CIC) ( <a href="https://catalog.uncg.edu/arts-sciences/#additionalundergraduaterequirementstext">https://catalog.uncg.edu/arts-sciences/#additionalundergraduaterequirementstext</a> )		

## Major Requirements

Code	Title	Credit Hours
<b>Required</b>		<b>39</b>
CSC 130	Introduction to Computer Science	
CSC 230	Elementary Data Structures and Algorithms	

CSC 250	Foundations of Computer Science I
CSC 261	Computer Organization and Assembly Language
CSC 330	Advanced Data Structures
CSC 339	Concepts of Programming Languages
CSC 340	Software Engineering
CSC 350	Foundations of Computer Science II
CSC 362	System Programming
CSC 452	Theory of Computation
CSC 462	Principles of Operating Systems
CSC 471	Principles of Database Systems
CSC 490	Senior Capstone

### CSC Electives 12

Select an additional 12 credits from any CSC course at the 300 level or above.\*

### Supporting Discipline Requirements 12-14

MAT 196	Calculus A
or MAT 191	Calculus I
MAT 296	Calculus B
or MAT 292	Calculus II
PHI 222	Ethics in the Computer Age
STA 271	Fundamental Concepts of Statistics
or STA 290	Introduction to Probability and Statistical Inference

### Science Requirements 8

Select two of the following options:\*\*

BIO 111 & 111L	Principles of Biology I and Principles of Biology I Laboratory
BIO 112 & 112L	Principles of Biology II and Principles of Biology II Laboratory
CHE 111 & CHE 112	General Chemistry I and General Chemistry I Laboratory
CHE 114 & CHE 115	General Chemistry II and General Chemistry II Laboratory
PHY 291 & 291L	General Physics I with Calculus and General Physics I with Calculus Lab
PHY 292 & 292L	General Physics II with Calculus and General Physics II with Calculus Lab

\* Three of these credit hours may be satisfied by one of the following courses: MAT 293, MAT 310, MAT 390, MAT 396, STA 301, or STA 352

\*\* When registering for the science course, students must concurrently register for the lab component of the course.

## Optional Concentration

The optional concentration as detailed following the major requirements may be added, but is not required.

- Data Science and Big Data

## Electives

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

## Data Science and Big Data Concentration Requirements

- 9 credit hours as defined below
- Students in the Data Science and Big Data Concentration must satisfy all requirements for the B.S. in Computer Science, and must complete the following courses:

Code	Title	Credit Hours
<b>Required</b>		<b>9</b>
CSC 405	Data Science	
CSC 410	Big Data and Machine Learning	
<i>Select 3 credits from the elective courses below</i>		
CSC 407	Network Analysis	
CSC 416	Digital Image Processing	
CSC 417	Deep Learning in Computer Vision	
CSC 425	Bioinformatics	
CSC 429	Artificial Intelligence	
CSC 454	Algorithm Analysis / Design	
CSC 474	Principles of Data Mining	
STA 431	Introduction to Probability	
STA 435	Theory Linear Regression	

## Disciplinary Honors in Computer Science Requirements

- A minimum of 12 credit hours as defined below.
- A grade of B or higher in all course work used to satisfy the Honors requirements in Computer Science and at least a 3.30 overall GPA at graduation.

Code	Title	Credit Hours
<b>Required</b>		<b>6</b>
CSC 493	Honors Work in Computer Science *	
HSS 490	Senior Honors Project **	
<b>Select 6 credits from the following:</b>		<b>6</b>
CSC 415	Computer Graphics	
CSC 416	Digital Image Processing	
CSC 425	Bioinformatics	
CSC 427	Numerical Analysis and Computing	
CSC 429	Artificial Intelligence	
CSC 439	Introduction to Compiler Design	
CSC 442	Human-Computer Interface Dev	
CSC 454	Algorithm Analysis / Design	
CSC 461	Prin of Computer Architecture	
CSC 471	Principles of Database Systems	
CSC 477	Prin of Computer Networks	
CSC 478	Prin of Wireless Networks	

\* Taken first in the sequence.

\*\* Taken second in the sequence.

## Recognition

Receive a Certificate of Disciplinary Honors in Computer Science; 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 Lixin Fu at [L\\_fu@uncg.edu](mailto:L_fu@uncg.edu) for further information and guidance about Honors in Computer Science.

To apply: <https://honorscollege.uncg.edu/lloyd-international-honors-college/academics/admissions-scholarships/disciplinary-honors-admissions/>.

## Accelerated B.S. to M.S. Application and Admission

Qualified UNC Greensboro undergraduate students who are pursuing the Bachelor of Science (B.S.) in Computer Science may be nominated to participate in the Accelerated Master's Program (AMP) by the Graduate Program Director. Students must have completed a minimum of 60 credit hours with at least 30 credits and a cumulative undergraduate GPA of at least 3.5 at UNC Greensboro.

## 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:

Code	Title	Credit Hours
CSC 652	Theory of Computation	3
CSC 654	Algorithm Analysis and Design	3
CSC 662	Principles of Operating Systems	3
CSC 677	Principles of Computer Networks	3

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.