

COMPUTER SCIENCE, BS

Computing touches everyone's daily lives – the results of computer scientists can be found not only in video games, smartphones and the latest animated movie, but can also be found in automobiles, airplanes, and commonly used appliances such as microwaves, televisions, and most other electronic devices. Through studying computer science, students develop and extend logical thinking and problem-solving skills useful in many career roles. Graduates in computer science will be prepared for admission to graduate study or for immediate employment in business, industry, or government positions involving computer systems and techniques.

Program Objectives

The mission of the Department of Computer Science is to provide a broad-based, high-quality education in computer science. Our program will provide its graduates with a body of knowledge and an attitude toward learning that allows them to contribute to the profession and, ultimately, to society. In order to accomplish this, we must provide an academic experience sufficiently rich in both theory and practice to ensure the development of fundamentally sound, skilled graduates.

For our B.S. degree program in computer science, the following educational objectives describe what graduates are expected to attain within a few years following graduation:

- Successfully engage in professional practice in the computing sciences or apply computer science tools to another field of interest.
- Pursue advanced study in the computing sciences.
- Regularly demonstrate their ability to contribute to society in a professional and ethical manner, communicate effectively, and work successfully in both independent and team environments.

The computer science undergraduate program, leading to a bachelor of science degree, is designed to enable students to:

- Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Communicate effectively in a variety of professional contexts.
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- Apply computer science theory and software development fundamentals to produce computing-based solutions.

Freshman

Fall	Hours	Spring	Hours
CS 100 or 110 (CS I for Majors)	4	CS 101 or 111 (CS II for Majors)	4
CS 121 ¹	1	MATH 126	4
MATH 125	4	EN 102	3
ENGR 103 or 123	3	HI/SB elective ²	3
EN 101	3		
	15		14

Sophomore

Fall	Hours	Spring	Hours
CS 200 (Software Design and Engineering)	4	CS 201 (Data Structures & Algorithms)	4
ECE 380	4	ECE 383	4
MATH 301	3	HU/L/FA elective ²	3
HU/L/FA elective ²	3	Approved Nat Science (N) Elective	4
	14		15

Junior

Fall	Hours	Spring	Hours
CS 300	3	CS 403	3
CS 301	3	Computer Science elective, 400-level ⁴	3
GES 255 or MATH 355	3	MATH 237	3
HI/SB Elective ²	3	HI/SB elective ²	3
Free elective ³	3	Free elective ³	3
	15		15

Senior

Fall	Hours	Spring	Hours
CS 470	3	CS 495	3
Computer Science elective, 400 level ⁴	3	Approved natural science (N) elective (must complete a sequence when paired with either of the two N electives previously chosen)	4
Approved Natural Science (N) elective	4	Computer Science elective - 400-level ⁴	3
HU/L/FA elective ²	3	Computer Science elective - 400-level ⁴	3
Free elective ³	3	Free elective ³	3
	16		16

Total Hours: 120

Footnotes

- ¹ CS 121 is recommended, but it may be substituted with ENGR 111 or any other engineering introductory course.
- ² Students must complete a sequence of two of the HU/L/FA or HI/SB elective courses from the same department.
- ³ Mathematics courses below calculus cannot be used to fulfill these hours.
- ⁴ CS 330 or CS 492 can be used to satisfy one of the 3 credit hours of the required 12 credit hours of 400-level computer science electives. Both cannot be used.

Honors Courses

Any honors section of a course accepted toward an engineering degree may be applied in place of the non-honors section.

Transfer Courses

Please see the College of Engineering policy on transfer courses.

Repeating Courses

Please see the College of Engineering policy on repeating courses.

Approved Natural Science Electives

Approved Natural Science (N) electives must be chosen from majors courses. Potential courses include:

Code and Title	Hours
AY 101 Intro To Astronomy (Must take AY 102 to complete the N credit)	3
AY 102 Intro Astronomy Lab (Must take AY 101 to complete the N credit)	1
AY 203 Observational Astronomy (Must take AY 204 to complete the N credit)	2
AY 204 Solar System Astronomy (Must take AY 204 to complete the N credit)	3
BSC 114 Principles Of Biology I (Must take BSC 115)	3
BSC 115 Laboratory Biology I	1
BSC 116 Principles Biology II (Must take BSC 117)	3
BSC 117 Laboratory Biology II	1
CH 101 or CH 117 General Chemistry Honors General Chemistry	4
CH 102 or CH 118 General Chemistry Honors General Chemistry	4
GEO 101 The Dynamic Earth	4
GEO 102 The Earth Through Time	4
GEO 105 Sustainable Earth	4
GY 101 Atmospheric Proc & Patterns	4
GY 102 Earth Surface Processes	4
PH 101 General Physics I	4
PH 102 General Physics II	4
PH 105 or PH 125 General Physics W/Calc I Honors Gen Ph W/Calculus	4
PH 106 or PH 126 General Physics W/Calc II Honors Gen Ph W/Calculus II	4
Total Hours	61

Approved Computer Science Electives

Approved Computer Science electives must be chosen from majors courses. Potential courses include:

Code and Title	Hours
CS 330 Web Development	3
CS 407 Software Interface Desgn	3
CS 416 Testing and Quality Assurance	3
CS 420 Software Evolution	3
CS 428 Computer Security	3
CS 435 Computer Graphics	3
CS 438 Computer Comm & Networks	3
CS 442 Cryptography	3
CS 443 Digital Forensics	3
CS 444 Software Security	3
CS 445 Software Reverse Engineering	3
CS 448 Network Security	3

CS 451 Data Science	3
CS 452 Information Retrieval	3
CS 455 Social Media Data Analytics	3
CS 460 Intro to Autonomous Robotics	3
CS 461 Brain Computer Interface	3
CS 465 Artificial Intelligence	3
CS 475 Formal Languages & Machines	3
CS 480 Computer Simulation	3
CS 481 High Performance Computing	3
CS 483 Comp Foundations of ML	3
CS 484 Reinforcement Learning	3
CS 491 Special Topics	3
CS 492 Special Prob (Area)	1 to 3

Only one of CS 330 or CS 492 can be used to satisfy 3 of the 12 required credit hours. Both cannot be used.

Minors for Computer Science Majors

A minor is not required for students majoring in computer science.

However, we strongly encourage all students to combine their individual interests with the free electives in the program to complete a minor in an area of interest to them. For example, computer science majors may earn a minor in mathematics by completing the mathematics courses required by the computer science curriculum plus MATH 227 Calculus III and one additional math course numbered 300 or above, such as MATH 355 Theory Of Probability.

Concentration in Cyber Security

In addition to the standard Bachelor of Science in Computer Science degree, the department offers a concentration in cyber security. This concentration will give students a deeper understanding of cyber security, a sub-discipline of computer science. This concentration requires 9 hours of 400-level cyber security classes, chosen from the list below. Students who successfully complete this concentration will have the designation indicated on their transcripts.

Select 9 hours (3 courses) from the list below:	Hours
CS 428 Computer Security	3
CS 438 Computer Comm & Networks	3
CS 443 Digital Forensics	3
CS 444 Software Security	3
CS 445 Software Reverse Engineering	3
CS 448 Network Security	3

The coursework required for the Cyber Security Concentration is the same as what is shown above for the computer science degree. The current list of approved software engineering electives can be found on the Department of Computer Science's website.

This concentration does not require the student to take more than the 120 hours required for the Computer Science (B.S.) degree, since six of these course hours replace six hours of CS electives, and the other three hours can be taken from the free electives in the Computer Science (B.S.) curriculum.

Students with a computer science degree may work in a traditional software company such as Google, Microsoft or IBM or in many industries driven by automation needs.

Types of Jobs Accepted

Our students primarily are employed in the computer industry as software developers, software engineers and security and program analysts. Recent graduates are employed at places such as Amazon, Google, Intergraph, IBM, ADTRAN, Southern Company, and AT&T.

Jobs of Experienced Alumni

Our students advance to positions such as owner of their own company, software designer, network engineer and IT/IS supervisory roles. These jobs involve the direction and management of large-scale software development projects and their deployment.

Learn more about opportunities in this field at the Career Center