COMPUTER SCIENCE

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Programs Offered

Bachelor of Science in Computer Science

Minor in Computer Science

Computer science is the scientific study of computing devices, the software that drives them, and the computational tasks they are capable of performing. Computer scientists study both hardware and software; as with all sciences, each of these possesses both theoretical and applied components. Computing theory shares knowledge and techniques with the fields of mathematics, physics, engineering, philosophy, psychology, and linguistics. Its applications span the range of human endeavors: the physical life and social sciences; the literary, visual, and performing arts; law; government; recreation; and virtually every sector of the commercial world. Thus, computer science is by its very nature an interdisciplinary subject that offers both a solid unifying foundation for a liberal arts and sciences education, and valuable career skills.

The curriculum consists of a rigorous course of study in computer science and mathematics and provides the student with a thorough grounding in programming, fundamentals of computer organization, data structures, and algorithm design. It is designed to prepare students for careers in the computer industry and graduate work in computer science.

All courses submitted toward either major or minor requirements in the Computer Science Department must be taken for a letter grade (A-F). This includes electives in CS and all other courses taken to satisfy the major. This does not apply to courses that are challenged. Only those classes for which the student has received a C- or better may be used to satisfy prerequisite requirements. An instructor may require the student to provide evidence of having met prerequisite requirements.

Degree Requirements for a Bachelor of Science in Computer Science

General Education (50 units, 6-9 covered by major requirements)	41 - 44 units
Computer Science Core	49 units
Computer Science Electives	9 units
Computer Science Capstone Requirement	3 units
Required Supporting Courses	10 -12 units
General Electives:	7-9 units
Total units needed for graduation:	**124**

Major Core Requirements

CS 115 Programming I (GE Area B3)	4
CS 210 Introduction to Unix	1
CS 215 Programming II	4
CS 242 Discrete Structures for Computer Science	4
CS 252 Introduction to Computer Organization	4
CS 315 Data Structures	4
CS 351 Computer Architecture	4
CS 355 Database Management Systems Design	4
CS 370 Software Design and Development	4
CS 415 Algorithm Analysis	4
CS 450 Operating Systems	4
CS 454 Theory of Computation	4
CS 460 Programming Languages	4

Total units in major core	**49**

Computer Science Electives

Choose 9 units of upper-division CS electives (see list below). No more than 3 units can be satisfied by a combination of CS 349, 390, 495, and 497.

CS 340 Computer Security and Malware	3
CS 349 Problem Solving in a Team Environment	1
CS 360 Object-Oriented Programming	3
CS 365 Computer Networking and the Internet	3
CS 375 Computer Graphics	3
CS 385 Selected Topics	1-4*
CS 390 Computer Science Colloquium	1
CS 452 Compiler Design and Construction	3
CS 465 Data Communications	3
CS 480 Artificial Intelligence	3
CS 495 Special Studies	1-4
CS 496 Senior Seminar	1-4
CS 497 Internship	2

*Selected topics courses include Bioinformatics, Data Compression, Computer Game Development, Parallel and Distributed Computing, Wireless Networks, Mobile Application Development, and other current topics in computer science.

Total units in major electives	**9**

CS Capstone Requirement

One of the following courses:

CS 470 Advanced Software Design Project	3
CS 496 Senior Research Project	3
Total units in capstone requirement	**3**

Required Supporting Courses

MATH 161 Differential and Integral Calculus I (GE Area B4)	4

Two additional courses from the following: 6-8

MATH 165 Elementary Statistics	4
MATH 211 Differential and Integral Calculus II	4
MATH 222 Elementary Applied Linear Algebra	3
MATH 241 Differential Equations with Linear Algebra	4
MATH 306 Number Theory	3
MATH 316 Graph Theory and Combinatorics	3
MATH 352 Numerical Analysis	3
MATH 416 Graph Theory and Combinatorics	3
MATH 430 Linear Systems Theory	3
MATH 470 Mathematical Models	3
PHYS 214 Introduction to Physics II	4
(Prerequisite PHYS 114, GE Area B1)	
Or other by arrangement with the CS Department	
Total units in other required courses	**10-12**
Total units in the major	**71-73**

Minor in Computer Science

Students electing this minor will be prepared for careers in business application programming, scientific application programming, computer equipment sales, as field engineers, and as data processing managers among the myriad job opportunities associated with the computer field. Approval of the minor curriculum should be obtained by the junior year at the latest in order that the minor may be properly planned.

Minor Core Requirements

CS 115 Programming I	4
CS 210 Introduction to UNIX	1
CS 215 Programming II	4
Total units in minor core	**9**

Minor Electives

Choose 11 units of CS major courses (listed under *Major Core Requirements* and *Computer Science Electives*) of which 6 units must be upper-division. No more than 2 units in any combination of CS 349, 390, 495, and 497 can be applied toward the minor.

Total units in minor electives	**11**
Total units in the minor	**20**

Sample Four-Year Plan for Bachelor of Science in Computer Science

FRESHMAN YEAR: 28 Units

Fall Semester (13 Units)	*Spring Semester (15 Units)*
CS 115 (GE-B3) (4)	CS 210 (1)
GE (3), GE (3), GE (3)	CS 215 (4)
	MATH 161 (GE-B4) (4)
	GE (3), GE (3)

SOPHOMORE YEAR: 30-31 Units

Fall Semester (16/17 Units)	*Spring Semester (14 Units)*
CS 242 (4)	CS 252 (4)
Supporting Course in MATH/PHYS (3/4)	CS 315 (4)
GE (3), GE (3), GE (3)	GE (3), GE (3)

JUNIOR YEAR: 33-34 Units

Fall Semester (16/17 Units)	*Spring Semester (17 Units)*
CS 351 (4)	CS 355 (4)
Supporting Course in MATH/PHYS (3/4)	CS 370 (4)
CS Elective (3)	CS Elective (3)
GE (3), GE (3)	Upper-division GE (3)
	General Elective (3)

SENIOR YEAR: 30 Units

Fall Semester (15 Units)	*Spring Semester (15 Units)*
CS 450 (4)	CS 415 (4)
CS 454 (4)	CS 470 (3)
CS 460 (4)	CS Elective (3)
Upper-division GE (3)	Upper-division GE (3)
	General Electives (3-5*)
	*to total 124 units

TOTAL UNITS: 124