COMPUTER SCIENCE, BS

Program Learning Outcomes

Graduates of this program will be able to:

a. Solve complex and significant problems with professional skill by formulating efficient and effective algorithmic solutions to a wide variety of sophisticated problems normally encountered in computing and in academe
b. Express algorithms clearly and correctly in a variety of programming languages
c. Apply core concepts in computer science
d. Apply professional and ethical standards to computing related disciplines
e. Collaborate in teams to accomplish common goals
f. Demonstrate an ability to acquire, interpret, and communicate results orally or in writing

Program Requirements

Code	Title	Credit Hours
Core IMPACTS		**42**
All core curriculum recommendations are shown under the Core IMPACTS section of the Undergraduate Graduation Requirements. (https://nextcatalog.clayton.edu/graduation-requirements/undergraduate-graduation-requirements/core-curriculum/#nonsciencemajorstext)		
Field of Study - Computer Science		**18**
CSCI 1100	Applied Computing	3
CSCI 1301	Computer Science I	3
CSCI 1302	Computer Science II	3
CSCI 2302	Data Structures and Algorithms	3
CSCI 2305	Computer Organization and Architecture	3
MATH 2020	Introductory Discrete Math	3
Additional Lower Division Major Requirements		**15**
MATH 1501	Calculus I (carry-over taken in Area A2 or D2)	1
MATH 1401	Elementary Statistics	3
MATH 2140	Introductory Linear Algebra	3
MATH 2502	Calculus II [1]	4
Choose one from the following:		4
PHYS 2211 & 2211L	Principles of Physics I and Principles of Physics Lab I	
CHEM 1211 & 1211L	Principles of Chemistry I and Principles of Chemistry Laboratory I	
BIOL 1107 & 1107L	Principles of Biology I and Principles of Biology Lab I	
MATH 2503	Calculus III	
Upper Division Major Requirements		**24**
CSCI 3300	Professional Development and Ethics	3
CSCI 3305	Operating Systems	3
CSCI 3306	Computer Networks and Security	3
CSCI 3310	Databases Design and Implementation	3
CSCI 3320	Software Engineering Design	3
CSCI 3333	Programming Languages	3
CSCI 4333	Theory of Computation	3
or CSCI 4334	Algorithm Design and Analysis	
Choose one from the following:		3
CSCI 4320	Software Engineering Practicum	
CSCI 4360	Computer Science Research	
CSCI 4370	Internship in Computer Science	
Major Concentration		**15**
Choose one concentration from the following:		
Big Data Concentration (p. 1)		
Computer Engineering Concentration (p. 1)		
Cybersecurity Concentration (p. 1)		
Games Design and Programming Concentration (p. 2)		
General Computer Science Concentration (p. 2)		
Technical Writing		**3**
ENGL 3900	Professional & Tech. Writing	3
Free Elective		**3-6**
Choose three to six hours of free electives. [2]		
Total Credit Hours		**120**

Major Concentration Requirements

Big Data Concentration

Code	Title	Credit Hours
CSCI 4201	Advanced Topics in Databases	3
CSCI 4202	Data and Visual Analytics	3
CSCI 4307	Artificial Intelligence	3
CSCI 4308	Advanced Topics in Parallel and Distributed Computing	3
MATH 3220	Applied Statistics	3
or MATH 4350	Graph Theory	
Total Credit Hours		**15**

Computer Engineering Concentration

Code	Title	Credit Hours
ENGR 3020	Electronics	3
ENGR 3040	Digital Circuits and Computer Design	3
ENGR 4120	Embedded Systems	4
Two additional courses 3000+ level with any of the following prefixes: CSCI, ENGR, ITMM, ITNW		6
Total Credit Hours		**16**

Cybersecurity Concentration

Code	Title	Credit Hours
CSCI 3601	Software Security, Testing and Quality Assurance	3
or ITFN 3316	SW Security, Testing, and QA	
CSCI 4317	Operating System Security, Programming and Administration	3
or ITFN 4601	OS Security, Prog, & Admin	
ITNW 4501	Network Planning and Design	3
ITNW 4502	Secure Networks & Comm. Protoc	3

ITMM 4423	Security for E-Commerce	3
Total Credit Hours		**15**

Games Design and Programming Concentration

Code	Title	Credit Hours
CSCI 3301	Game Design & Programming	3
CSCI 4301	Game Design & Programming II	3
CSCI 4304	Computer Graphics	3
CSCI 4307	Artificial Intelligence	3
CSCI 4315	Human Computer Interface	3
or CSCI 4601	Mobile Software Development	
Total Credit Hours		**15**

General Computer Science Concentration

Choose 15 hours of upper-division CSCI courses.

Other Program-Specific Graduation Requirements

Computer Science students must earn a grade of C or better (or K) in the following courses:

- All IT courses (i.e., courses with ITDB, ITFN, ITNW, and ITMM prefixes)
- All CS courses (i.e., courses with CSCI prefix)
- ENGL 1101 English Composition I & ENGL 1102 English Composition II; CRIT 1101 Critical Thinking
- All MATH courses applied toward graduation
- All upper division courses applied toward graduation.

[1] One hour of carry-over if MATH 2502 Calculus II was taken in Area D2, otherwise must take MATH 2502 Calculus II to satisfy this requirement with 4 hours applied here.

[2] If MATH 2502 Calculus II was used for satisfying Area D2, then six credit hours remain as free electives.