MAJOR IN COMPUTER SCIENCE, COMPUTER SCIENCE CONCENTRATION

Requirements
Effective Fall 2025

A minimum grade of C (2.000) is required in CO 150 and in all CS, DSCI, MATH, STAT and departmental Technology Focus Elective courses which are required for graduation.

Freshman

		AUCC	Credits
CO 150	College Composition (GT-CO2)	1A	3
CS 201/PHIL 201	Ethical Computing Systems (GT-AH3)	3B	3
MATH 156 or 160[1]	Mathematics for Computational Science I (GT-MA1) Calculus for Physical Scientists I (GT-MA1)	1B	4
Select one group from the following:[2]			5-9
Group A			
CS 150A or 150B	Culture and Coding: Java (GT-AH3) Culture and Coding: Python (GT-AH3)	3B	
CS 162 or 164	CS1--Introduction to Java Programming CS1--Computational Thinking with Java		
Group B			
CS 152	Python for STEM		
CS 162 or 164	CS1--Introduction to Java Programming CS1--Computational Thinking with Java		
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-and-humanities)		3B	
Group C			
CS 163	CS1---No Prior Programming Experience		
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-and-humanities)		3B	
Select at least two courses totaling a minimum of 7 credits from the following (one course must be or include the sequenced laboratory):			7
AA 100 & AA 101	Introduction to Astronomy (GT-SC2)	3A	
ANTH 120 & ANTH 121	Human Origins and Variation (GT-SC2)	3A	
BZ 110 & BZ 111	Principles of Animal Biology (GT-SC2)	3A	
BZ 120	Principles of Plant Biology (GT-SC1)	3A	
CHEM 107 & CHEM 108	Fundamentals of Chemistry (GT-SC2)	3A	
CHEM 111 & CHEM 112	General Chemistry I (GT-SC2)	3A	
GEOL 120 & GEOL 121	Geology and Society (GT-SC2)	3A	
GEOL 122 & GEOL 121	Geoscience--Climate and Environmental Change (GT-SC2)	3A	
GEOL 124 & GEOL 121	Earth Resources and Sustainability (GT-SC2)	3A	

GEOL 150	Dynamic Earth (GT-SC2)	3A	
HONR 292A	Honors Seminar: Knowing in the Sciences	3A	
LIFE 102	Attributes of Living Systems (GT-SC1)	3A	
LIFE 103	Biology of Organisms-Animals and Plants (GT-SC1)	3A	
LIFE 201A	Introductory Genetics: Applied/Population/Conservation/Ecological (GT-SC2)	3A	
LIFE 201B	Introductory Genetics: Molecular/Immunological/Developmental (GT-SC2)	3A	
LIFE 220/LAND 220	Fundamentals of Ecology (GT-SC2)	3A	
NR 150	Oceanography (GT-SC2)	3A	
PH 121	General Physics I (GT-SC1)	3A	
PH 122	General Physics II (GT-SC1)	3A	
PH 141	Physics for Scientists and Engineers I (GT-SC1)	3A	
PH 142	Physics for Scientists and Engineers II (GT-SC1)	3A	
1C (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc)		1C	3
Electives[3]			1-5
	Total Credits		**30**

Sophomore

CS 165	CS2--Data Structures		4
CS 220	Discrete Structures and the Applications		4
Select one group from the following:			4-5
Group A			
CS 214	Software Development		
CT 301	C++ Fundamentals		
Group B			
CS 253	Software Development with C++		
Select one course from the following:			4
CS 250	Computer Systems Foundations		
CS 270	Computer Organization		
Select one course from the following:			3-4
DSCI 369	Linear Algebra for Data Science		
MATH 369	Linear Algebra I		
Select one course from the following:			1-3
STAT 301	Introduction to Applied Statistical Methods		
STAT 302A	Statistics Supplement: General Applications		
STAT 307	Introduction to Biostatistics		
STAT 315	Intro to Theory and Practice of Statistics		
Historical Perspectives (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)		3D	3
Social and Behavioral Sciences (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)		3C	3
Electives			0-4
	Total Credits		**30**

Junior

CS 314	Software Engineering	4A,4B	3
CS 320	Algorithms--Theory and Practice		3
CS 370	Operating Systems		3
Two CS courses numbered 300- or above, excluding 380-399 and 480-499			6-8
Advanced Writing (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)		2	3
Electives			10-12
	Total Credits		**30**

Senior

Capstone Course - select one course from the following:			4
CS 410	Introduction to Computer Graphics	4C	
CS 414	Object-Oriented Design	4C	
CS 420	Introduction to Analysis of Algorithms	4C	
CS 425	Introduction to Bioinformatics Algorithms	4C	
CS 430	Database Systems	4C	
CS 435	Introduction to Big Data	4C	
CS 440	Introduction to Artificial Intelligence	4C	
CS 445	Introduction to Machine Learning	4C	
CS 453	Introduction to Compiler Construction	4C	
CS 454	Principles of Programming Languages	4C	
CS 455	Introduction to Distributed Systems	4C	
CS 456	Modern CyberSecurity	4C	
CS 457	Computer Networks and the Internet	4C	
CS 458	Blockchain Principles and Applications	4C	
CS 462	Engaging in Virtual Worlds	4C	
CS 464	Principles of Human-Computer Interaction	4C	
CS 465	Multimodal Interaction for 3D User Interfaces	4C	
CS 470	Computer Architecture	4C	
CS 475	Parallel Programming	4C	
Two CS courses numbered 400- or above, excluding 480-499			8
Select one group from the following - Technology Focus or Minor/Second Major:			10
Group A - Technology Focus			
Technology Focus Electives (6 credits) - see list below			
CS course numbered 400- or above, excluding 480-499, not taken elsewhere in the program (4 credits)			
Group B - Minor or Second Major [4]			
Electives[5]			8
	Total Credits		**30**
	Program Total Credits:		**120**

Technology Focus Electives

If Group A - Technology Focus is selected Senior year, select at least 6 credits from the list below, not taken elsewhere in the program. At least 3 credits must be upper-division (300- to 400-level).

Code	Title	Credits
BZ 350	Molecular and General Genetics	4
BZ 360	Bioinformatics and Genomics	4
CIS 320	Project Management for Information Systems	3
CS 300-379		
CS 400-479		
CT 300-379 excluding CT 301		
CT 400-479		
DSCI 235	Data Wrangling	2
DSCI 300-379 excluding DSCI 369		
DSCI 400-479		
ECE 452	Computer Organization and Architecture	3
ENGR 422	Technology Entrepreneurship	3
IDEA 300-379		
IDEA 400-479		
JTC 372	Web Design and Development	3
JTC 472	Advanced Web Design and Development	3
MATH 161	Calculus for Physical Scientists II (GT-MA1)	4
MATH 256	Mathematics for Computational Science II	4
MATH 300-379 excluding MATH 369		
MATH 400-479		
MGT 330	Creativity, Innovation, and Value Creation	3
MGT 340	Fundamentals of Entrepreneurship	3
MGT 420	New Venture Creation	3
PHIL 410	Gödel's Incompleteness Theorems	3
PHIL 411	Logic in Philosophy and Beyond	3
PHIL 415	Logic and Scientific Method	3
PSY 252	Mind, Brain, and Behavior	3
PSY 352	Learning and Memory	3
PSY 452	Cognitive Psychology	3
PSY 454	Biological Psychology	3
PSY 456	Sensation and Perception	3
PSY 458	Cognitive Neuroscience	3

STAT 300-379 excluding STAT 301, STAT 302A, STAT 307, STAT 315	
STAT 400-479	

1 MATH 156 recommended for computer science majors who do not already have MATH 160 credit.

2 Recommended sequence for most incoming students is Group A: CS 150B to CS 164.

3 CS 192 or other seminar course is a recommended elective for incoming first semester students.

4 Of the 21 credits for the minor or second major, none may be from CS.

5 Select enough elective credits to bring the program total to a minimum of 120 credits, of which at least 42 must be upper-division (300- to 400-level).