MAJOR IN COMPUTER SCIENCE, COMPUTING SYSTEMS CONCENTRATION

Requirements Effective Fall 2023

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

Freshman			
		AUCC	Credits
CO 150	College Composition (GT-CO2)	1A	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	e 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:			
Arts and Humanities (l aucc/#arts-and-huma	http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/ nities)	3B	
CS 152	Python for STEM		
CS 162 or 164	CS1-Introduction to Java Programming CS1-Computational Thinking with Java		
Group C:			
Arts and Humanities (l aucc/#arts-and-huma	http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/ nities)	3B	
CS 163	CS1No Prior Programming Experience		
CS 201/PHIL 201	Ethical Computing Systems (GT-AH3)	3B	3
Select at least two cours include the sequenced la	es totaling a minimum of 7 credits from the following (one course must be or boratory):		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	Exploring Earth - Physical Geology (GT-SC2)	3A	
GEOL 122 & GEOL 121	The Blue Planet - Geology of Our Environment (GT-SC2)	3A	
GEOL 124 & GEOL 121	Geology of Natural Resources (GT-SC2)	3A	

CECU 150 Physical (Beology for Scientists and Engineers 3A				
LIFE 102				
LIFE 201A Introductory Genetics: Applied/Population/Conservation/Ecological (GT - SC2)				
SC2 Introductory Genetics: Molecular/Immunological/Developmental (GTSC2) 3A Introductory Genetics: Molecular/Immunological/Developmental (GTSC2) 3A Introductory Genetics: Molecular/Immunological/Developmental (GTSC2) 3A Introductory GENEC2) 3A Introductory GENEC2) 3A Introductory GENEC2 3A Introductory GENE				
LIFE 220/LAND 220	LIFE 201A		3A	
NR 150	LIFE 201B	Introductory Genetics: Molecular/Immunological/Developmental (GT-SC2)	3A	
PH 121	LIFE 220/LAND 220	Fundamentals of Ecology (GT-SC2)	3A	
PH 122 General Physics II (GTSCI) 3A PH 141 Physics for Scientists and Engineers II (GTSCI) 3A Diversity, Equity, and Inclusion (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion) 1C 3 Electives³ Total Credits 30 Sophomore Total Credits 30 CS 155 CS2-Data Structures 4 CS 220 Discrete Structures and their Applications 4 Select one group from the following: 4 CS 2214 Software Development CS 253 Software Development with C++ Select one course from the following: 4 CS 253 Computer Systems Foundations 5 CS 270 Computer Organization Select one course from the following: 3 CS 250 Computer Organization Select one course from the following: 3 CS 270 Computer Organization Select one course from the following: 3	NR 150	Oceanography (GT-SC2)	3A	
PH 141 Physics for Scientists and Engineers I (GTSC1) 3A PH 142 Physics for Scientists and Engineers II (GTSC1) 3A Diversity, Equity, and Inclusion (Intrt)/catallog colostate edu/general-catalog/all-university-core curriculum/aucc/#diversity-equity-inclusion) 1c 3 Electives³ Total Credits 30 Sophomore CS 156 CS2-Data Structures 4 CS 220 Discrete Structures and their Applications 4 Select one group from the following: 4 CS 214 Software Development 4 CT 301 C+F Fundamentals 4 Group B 4 4 CS 253 Software Development with C++ 4 Select one course from the following: 4 CS 250 Computer Gystems Foundations 5 CS 270 Computer Organization 4 Select one course from the following: 3 Select one course from the following: 1 Select one course from the following: 1 STAT 301 Introduction to Applied Statistical Methods	PH 121	General Physics I (GT-SC1)	3A	
PH 142	PH 122	General Physics II (GT-SC1)	3A	
Diversity, Equity, and Inclusion (http://catalog.colostate.edu/general-catalog/all-university-core urriculum/aucc/#diversity-equity-inclusion) Total Credits	PH 141	Physics for Scientists and Engineers I (GT-SC1)	3A	
Electives	PH 142	Physics for Scientists and Engineers II (GT-SC1)	3A	
Total Credits 30 Sophomore			10	3
Sophomore	Electives ³			1-5
CS 165 CS2-Data Structures 4		Total Credits		30
CS 220 Discrete Structures and their Applications 4 Select one group from the following: 4.5 Group A CS 214 Software Development CT 301 C++ Fundamentals CFURLATION OF THE PROOF OF THE	Sophomore			
CS 220 Discrete Structures and their Applications 4 Select one group from the following: 4.5 Group A CS 214 Software Development CT 301 C++ Fundamentals Fundamentals Group B Software Development with C++ Fundamentals Select one course from the following: 4 CS 250 Computer Systems Foundations 5 CS 270 Computer Organization 3-4 DSC1 369 Linear Algebra 1 3-4 Select one course from the following: 3-4 Select one course from the following: 3-4 STAT 301 Introduction to Applied Statistical Methods 5-4 STAT 302A Statistics Supplement: General Applications 3-4 STAT 301 Introduction to Biostatistics 1-4 STAT 315 Intro to Theory and Practice of Statistics Historical Perspectives (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/ aucc/#social-behavioral-sciences (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/ aucc/#social-behavioral-sciences (http://catalog.colostate.edu/general-catalog/all-university-core (application processed) 3-2 S314	·			
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Croup A CS 214 Software Development CT 301 C++ Fundamentals CT 301 C++ Fundamentals CT 301 C++ Fundamentals CT 301 C++ Fundamentals CS 253 Software Development with C++ CS 250 Computer Systems Foundations CS 270 Computer Organization CS 270 CS 2550 CS	Select one group from the fo			4-5
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	Advanced Writing (http://ca		2	3

Electives			2-6
	Total Credits		26-34
Senior			
Systems Courses - se	elect three courses from the following (one of the selected course	es will fulfill AUCC	12
4C):			
CS 435	Introduction to Big Data	4C	
CS 453	Introduction to Compiler Construction	4C	
CS 455	Introduction to Distributed Systems	4C	
CS 457	Computer Networks and the Internet	4C	
CS 475	Parallel Programming	4C	
Systems Elective - se	elect one course from the following:		4
CS 422	Automata, Logic, and Computation		
CS 440	Introduction to Artificial Intelligence		
CS 445	Introduction to Machine Learning		
Electives ⁴			14
	Total Credits		30
	Program Total Credits:		120

Technical Electives (6 credits)

Select a minimum of 6 credits, of which 3 credits must be upper-division.

Code	Title	Credits
•	A, or MATH courses numbered 300- or 399 and 480-499, and DSCI 369, MATH 369,	
Any STAT Courses nu 307, 315, 380-399 and	mbered 300- or above, excluding 301, 302A, d 480-499	
BZ 350	Molecular and General Genetics	4
BZ 360	Bioinformatics and Genomics	4
CIS 320	Project Management for Information Systems	3
CIS 350	Operating Systems and Networks	3
CIS 360	Systems Analysis and Design	3
CIS 413	Advanced Networking and Security	3
CIS 455	Advanced Database Management	3
ECE 452	Computer Organization and Architecture	3
ENGR 422	Technology Entrepreneurship	3
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
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

- MATH 156 recommended for computer science majors who do not already have MATH 160 credit.
- 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.
- 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 400level).