

MAJOR IN COMPUTER SCIENCE, COMPUTING FOR CREATIVES CONCENTRATION

The Computing for Creatives Concentration is intended for students who seek to work at the interface of computer science and creative fields such as film, theater, art and design. The concentration combines the core computing curriculum with computationally-focused study in creative fields.

Learning Objectives

Upon successful completion, students will be able to:

1. Demonstrate proficiency in most core areas of computer science and have a thorough grounding in the key principles and practices of computing.

2. Utilize advanced computing skills to create artifacts such as art, film, games, and 3D simulations that interact with people visually and aurally.
3. Demonstrate design, narrative, and human factors skills required to create those artifacts.
4. Communicate ideas effectively, both generally and with regard to computing and technology.
5. Confidently pursue graduate studies or professional employment in both computer science and fields combining computing and the creative arts.

Requirements Effective Fall 2024

A minimum grade of C (2.000) is required in CO 150 and in all CS, DSCI, MATH, STAT and IDEA 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			4-7
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		
Group C			
CS 163	CS1–No Prior Programming Experience		
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	

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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	
Diversity, Equity, and Inclusion (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion)		1C	3
Electives ³			3-6
Total Credits			30
Sophomore			
CS 165	CS2--Data Structures		4
CS 220	Discrete Structures and their Applications		4
IDEA 210	Introduction to Design Thinking (GT-AH1)	3B	3
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:			2-4
DSCI 369	Linear Algebra for Data Science		
MATH 269	Geometric Introduction to Linear Algebra		
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 (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)		3D	3
Social and Behavioral Sciences (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)		3C	3
Electives			0-5
Total Credits			29
Junior			
CS 250	Computer Systems Foundations		4
CS 314	Software Engineering	4A,4B	3
CS 320	Algorithms--Theory and Practice		3
CS 345	Machine Learning Foundations and Practice		3
CS course numbered 300- or above, excluding 386-399 and 486-499			3-4

Advanced Writing (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)	2	3
Electives		10-11

Total Credits		30
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Senior

Capstone Course - Select one course from the following:		4
CS 462 Engaging in Virtual Worlds	4C	
CS 464 Principles of Human-Computer Interaction	4C	
Design Thinking - Select a minimum of nine credits from the following courses:		9
IDEA 310H/CS 310H Design Thinking Toolbox: Mixed Reality Design		
IDEA 310L Design Thinking Toolbox : Creating Things That Think		
IDEA 3100 Design Thinking Toolbox: Digital Interaction and Game Design		
IDEA 310Q Design Thinking Toolbox: 3D Animation and Storytelling		
IDEA 450 Design Thinking Collaborative		
IDEA 455/MGT 455 Designing for Defense		
Two CS courses numbered 400- or above, excluding 486-499		8
Electives ⁴		10

Total Credits		31
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Program Total Credits:		120
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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 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).

Major Completion Map

Distinctive Requirements for Degree Program:

To prepare for first semester: The curriculum for the Computer Science major assumes students enter college prepared to take calculus. Entering students who are not prepared to take calculus will need to fulfill pre-calculus requirements in the first semester. All students must maintain a C (2.000) or better in CO 150 and in all CS, DSCI, MATH, STAT, and IDEA courses which are required for graduation.

Freshman

Semester 1	Critical	Recommended	AUCC	Credits
CO 150 College Composition (GT-CO2)	X		1A	3
First course from Group A, B, or C (See options in Concentration Requirements Tab)	X			2-4
Department Approved Science (See list on Concentration Requirements Tab)	X		3A	3
Diversity, Equity, and Inclusion (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion)	X		1C	3
Elective		X		2-4
MATH 124 and MATH 126 may be necessary for some students to fulfill pre-calculus requirements.	X			
Total Credits				15

Semester 2	Critical	Recommended	AUCC	Credits
CS 201/PHIL 201 Ethical Computing Systems (GT-AH3)	X		3B	3
MATH 156 or 160 Mathematics for Computational Science I (GT-MA1) Calculus for Physical Scientists I (GT-MA1)	X		1B	4
Remaining course(s) from Group A, B, or C (See options in Concentration Requirements Tab)	X			0-4
Department Approved Science with Lab (See list on Concentration Requirements Tab)	X		3A	4

CO 150 must be completed by the end of Semester 2 with a grade of C or better.		X			
Elective					0-4
Total Credits					15
Sophomore					
Semester 3					
		Critical	Recommended	AUCC	Credits
CS 165	CS2--Data Structures	X			4
CS 220	Discrete Structures and their Applications	X			4
IDEA 210	Introduction to Design Thinking (GT-AH1)	X		3B	3
Select one course from the following:		X			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 (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)			X	3D	3
Total Credits					15-17
Semester 4					
		Critical	Recommended	AUCC	Credits
Select one group from the following:		X			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:		X			2-4
DSCI 369	Linear Algebra for Data Science	X			
MATH 269	Geometric Introduction to Linear Algebra				
MATH 369	Linear Algebra I	X			
Social and Behavioral Sciences (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)			X	3C	3
Electives			X		0-5
CS 165 and CS 220 and CS 270 must be completed by the end of Semester 4.		X			
MATH 156 or MATH 160 and MATH 269 or MATH 369 or DSCI 369 must be completed by the end of Semester 4.		X			
Total Credits					12-14
Junior					
Semester 5					
		Critical	Recommended	AUCC	Credits
CS 314	Software Engineering	X		4A,4B	3
CS 320	Algorithms--Theory and Practice	X			3
Advanced Writing (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)			X	2	3
Electives			X		5
Total Credits					14
Semester 6					
		Critical	Recommended	AUCC	Credits
CS 250	Computer Systems Foundations		X		4
CS 345	Machine Learning Foundations and Practice	X			3
CS courses numbered 300- or above, excluding 380-399 and 480-499		X			3-4
Electives			X		5-6
CS 314 and CS 320 and CS 345 must be completed by the end of Semester 6.		X			
Total Credits					16

Senior					
Semester 7					
		Critical	Recommended	AUCC	Credits
CS 462 or 464	Engaging in Virtual Worlds Principles of Human-Computer Interaction	X		4C	4
	CS course numbered 400- or above, excluding 480-499	X			4
	Design thinking Courses (see list on Program Requirements tab)	X			9
	At least 2 Upper-Division CS classes must be completed by the end of Semester 7.	X			
Total Credits					17
Semester 8					
		Critical	Recommended	AUCC	Credits
	CS*** Course numbered 400- or above	X			4
	Electives	X			10
	The benchmark courses for the 8th semester are the remaining courses in the entire program of study.	X			
Total Credits					14
Program Total Credits:					120