MAJOR IN DATA SCIENCE, COMPUTER SCIENCE CONCENTRATION

Requirements
Effective Fall 2023

Freshman

		AUCC	Credits
CO 150	College Composition (GT-CO2)	1A	3
CS 150B	Culture and Coding: Python (GT-AH3)	3B	3
CS 164	CS1--Computational Thinking with Java		4
DSCI 100	First Year Seminar in Data Science		1
DSCI 369	Linear Algebra for Data Science		4
MATH 156[1]	Mathematics for Computational Science I (GT-MA1)	1B	4
STAT 158	Introduction to R Programming		1
STAT 315	Intro to Theory and Practice of Statistics		3
Biological and Physical Sciences (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#biological-physical-science)		3A	3
Diversity, Equity, and Inclusion (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion)		1C	3
	Total Credits		**29**

Sophomore

CS 165	CS2--Data Structures		4
CS 220	Discrete Structures and their Applications		4
CS 250 or 270	Computer Systems Foundations Computer Organization		4
DSCI 235	Data Wrangling		2
MATH 151	Mathematical Algorithms in Matlab I		1
MATH 256[1]	Mathematics for Computational Science II		4
STAT 341	Statistical Data Analysis I		3
STAT 342	Statistical Data Analysis II		3
Biological and Physical Sciences (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#biological-physical-sciences)		3A	4
	Total Credits		**29**

Junior

CS 201/PHIL 201	Ethical Computing Systems (GT-AH3)	3B	3
CS 214	Software Development		3
Select one course from the following:			3
CS 320	Algorithms--Theory and Practice		
CS 370	Operating Systems		
DSCI 320	Optimization Methods in Data Science		3
DSCI 335	Inferential Reasoning in Data Analysis		3
DSCI 336	Data Graphics and Visualization		1
Select one course from the following:			3
CO 300	Writing Arguments (GT-CO3)	2	
CO 301B	Writing in the Disciplines: Sciences (GT-CO3)	2	
CO 302	Writing in Digital Environments (GT-CO3)	2	

JTC 300	Strategic Writing and Communication (GT-CO3)	2	
Computer Science Electives (Select two CS courses from the Computer Science Electives List below)			6-8
Social and Behavioral Sciences (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)		3C	3
	Total Credits		**28-30**

Senior

DSCI 445	Statistical Machine Learning	4B	3
DSCI 478	Capstone Group Project in Data Science	4A,4C	4
Data Science Electives (Select a minimum of 9 credits from the Data Science Electives List below)			9
Historical Perspectives (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)		3D	3
Electives[2]			13-15
	Total Credits		**32-34**
	Program Total Credits:		**120**

Computer Science Electives List

Code	Title	AUCC	Credits
Select two courses from the list below not taken elsewhere in the program:			
CS 314	Software Engineering		3
CS 320	Algorithms--Theory and Practice		3
CS 370	Operating Systems		3
CS 420	Introduction to Analysis of Algorithms		4
CS 425	Introduction to Bioinformatics Algorithms		4
CS 430	Database Systems		4
CS 435	Introduction to Big Data		4
CS 440	Introduction to Artificial Intelligence		4
CS 445	Introduction to Machine Learning		4
CS 455	Introduction to Distributed Systems		4
CS 475	Parallel Programming		4

Data Science Electives List

Code	Title	AUCC	Credits
DSCI 473	Introduction to Geometric Data Analysis		2
DSCI 475	Topological Data Analysis		2
ECON 202	Principles of Microeconomics (GT-SS1)	3C	3
ECON 204	Principles of Macroeconomics (GT-SS1)	3C	3
ECON 435	Intermediate Econometrics		3
MATH 301	Introduction to Combinatorial Theory		3
MATH 317	Advanced Calculus of One Variable		3
MATH 331	Introduction to Mathematical Modeling		3
MATH 332	Partial Differential Equations		3
MATH 345	Differential Equations		4
MATH 360	Mathematics of Information Security		3

MATH 450	Introduction to Numerical Analysis I	3
MATH 451	Introduction to Numerical Analysis II	3
MATH 460	Information and Coding Theory	3
STAT 400	Statistical Computing	3
STAT 420	Probability and Mathematical Statistics I	3
STAT 421	Introduction to Stochastic Processes	3
STAT 430	Probability and Mathematical Statistics II	3
STAT 440	Bayesian Data Analysis	3
STAT 460	Applied Multivariate Analysis	3

[1] The calculus requirement for the major may alternatively be satisfied by completion of MATH 160, MATH 161, and MATH 261.

[2] 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).