

# MAJOR IN DATA SCIENCE, NEUROSCIENCE 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
LIFE 102	Attributes of Living Systems (GT-SC1)	3A	4
MATH 156 <sup>1</sup>	Mathematics for Computational Science I (GT-MA1)	1B	4
PSY 100	General Psychology (GT-SS3)	3C	3
STAT 158	Introduction to R Programming		1
STAT 315	Intro to Theory and Practice of Statistics		3
<b>Total Credits</b>			<b>30</b>

### Sophomore

CHEM 107	Fundamentals of Chemistry (GT-SC2)	3A	4
CHEM 108	Fundamentals of Chemistry Laboratory (GT-SC1)	3A	1
CS 165	CS2–Data Structures		4
CS 220	Discrete Structures and the Applications		4
DSCI 235	Data Wrangling		2
MATH 151	Mathematical Algorithms in Matlab I		1
MATH 256 <sup>1</sup>	Mathematics for Computational Science II		4
STAT 341	Statistical Data Analysis I		3
STAT 342	Statistical Data Analysis II		3
Select one course from the following:			3-4
BZ 350	Molecular and General Genetics		
LIFE 201B	Introductory Genetics: Molecular/Immunological/Developmental (GT-SC2)	3A	
<b>Total Credits</b>			<b>29-30</b>

### Junior

BMS 300	Principles of Human Physiology		4
CS 201/PHIL 201	Ethical Computing Systems (GT-AH3)	3B	3
DSCI 320/MATH 320	Optimization Methods in Data Science		3
DSCI 335	Inferential Reasoning in Data Analysis		3
DSCI 336	Data Graphics and Visualization		1
PSY 252	Mind, Brain, and Behavior		3
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	

Data Science Electives (Select a minimum of 4 credits from a minimum of two courses from the Data Science Electives list below)			4
1C ( <a href="https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc">https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc</a> )	1C		3
Historical Perspectives ( <a href="https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives">https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives</a> )	3D		3
<b>Total Credits</b>			<b>30</b>
<b>Senior</b>			
BMS 325	Cellular Neurobiology		3
BMS 345	Functional Neuroanatomy		4
DSCI 445	Statistical Machine Learning	4B	3
DSCI 478	Capstone Group Project in Data Science	4A,4C	4
PSY 458	Cognitive Neuroscience		3
Neuroscience Electives (Select two courses not previously taken from the Neuroscience Electives List below)			6
Electives			7-8
<b>Total Credits</b>			<b>30-31</b>
<b>Program Total Credits:</b>			<b>120</b>

### Data Science Electives List

Code	Title	Credits
CS 214	Software Development	3
CS 250	Computer Systems Foundations	4
CS 270	Computer Organization	4
CS 314	Software Engineering	3
CS 320	Algorithms--Theory and Practice	3
CS 370	Operating Systems	3
CS 435	Introduction to Big Data	4
CS 440	Introduction to Artificial Intelligence	4
CT 301	C++ Fundamentals	2
DSCI 473	Introduction to Geometric Data Analysis	2
DSCI 475	Topological Data Analysis	2
ECON 202	Principles of Microeconomics (GT-SS1)	3
ECON 204	Principles of Macroeconomics (GT-SS1)	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 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
STAT 400	Statistical Computing	3
STAT 420	Probability and Mathematical Statistics I	3
STAT 430	Probability and Mathematical Statistics II	3
STAT 440	Bayesian Data Analysis	3

PSY 454	Biological Psychology	3
PSY 456	Sensation and Perception	3

<sup>1</sup> The calculus requirement for the major may alternatively be satisfied by completion of MATH 160, MATH 161, and MATH 261.

### Neuroscience Electives List

Code	Title	Credits
BMS 405	Nerve and Muscle-Toxins, Trauma and Disease	3
BMS 425	Introduction to Systems Neurobiology	3
BMS 450	Pharmacology	3