

# MAJOR IN DATA SCIENCE, ECONOMICS 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
ECON 202	Principles of Microeconomics (GT-SS1)	3C	3
ECON 204	Principles of Macroeconomics (GT-SS1)	3C	3
MATH 156 <sup>1</sup>	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
<b>Total Credits</b>			<b>29</b>

### Sophomore

CS 165	CS2–Data Structures		4
CS 220	Discrete Structures and their Applications		4
DSCI 235	Data Wrangling		2
ECON 211	Gender in the Economy (GT-SS1)	1C	3
ECON 304	Intermediate Macroeconomics		3
ECON 306	Intermediate Microeconomics		3
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
<b>Total Credits</b>			<b>30</b>

### Junior

CS 201/PHIL 201	Ethical Computing Systems (GT-AH3)	3B	3
DSCI 320	Optimization Methods in Data Science		3
DSCI 335	Inferential Reasoning in Data Analysis		3
DSCI 336	Data Graphics and Visualization		1
ECON 335/AREC 335	Introduction to Econometrics		3
ECON 435	Intermediate Econometrics		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	
Economics Electives (See List below)			6
Biological and Physical Sciences ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#biological-physical-sciences">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#biological-physical-sciences</a> )			3

Historical Perspectives ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives</a> )	3D	3
<b>Total Credits</b>		<b>31</b>
<b>Senior</b>		
DSCI 445	Statistical Machine Learning	4B
DSCI 478	Capstone Group Project in Data Science	4A,4C
Data Science Electives (Select a minimum of 9 credits not previously taken from the Data Science Electives List below)		9
Biological and Physical Sciences ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#biological-physical-sciences">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#biological-physical-sciences</a> )	3A	4
Electives <sup>2</sup>		10
<b>Total Credits</b>		<b>30</b>
<b>Program Total Credits:</b>		<b>120</b>

## Data Science Electives List

Code	Title	AUCC	Credits
CS 214	Software Development		3
CS 250	Computer Systems Foundations		4
CS 270	Computer Organization		4
CS 320	Algorithms--Theory and Practice		3
CS 370	Operating Systems		3
CT 301	C++ Fundamentals		2
DSCI 473	Introduction to Geometric Data Analysis		2
DSCI 475	Topological Data Analysis		2
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
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

## Economics Electives List

Code	Title	AUCC	Credits
ECON 315	Money and Banking		3
ECON 317	Population Economics		3
ECON 320	Economics of Public Finance		3
ECON 325	Health Economics		3

ECON 327	Law and Economics	3
ECON 332/POLS 332	International Political Economy	3
ECON 340/AREC 340	Introduction-Economics of Natural Resources	3
ECON 346/AREC 346	Economics of Outdoor Recreation	3
ECON 372	History of Economic Institutions and Thought	3
ECON 376	Marxist Economic Thought	3
ECON 379/HIST 379	Economic History of the United States	3
ECON 404	Macroeconomic Policy	3
ECON 410	Labor Economics	3
ECON 440	Economics of International Trade and Policy	3
ECON 442	Economics of International Finance and Policy	3
ECON 460	Economic Development	3
ECON 463	Regional Economics	3
ECON 474	Recent Economic Thought	3

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

<sup>2</sup> 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).