Data Science and Economics, BS

The combined major in data science and economics integrates fundamental economics courses with a strong programming foundation. Students study the collection, manipulation, storage, retrieval, and computational analysis of data in its various forms, including numeric, textual, image, and video data from small to large volumes. Utilizing these skill sets allows students to address complex issues in the behavior of individuals and the collective behavior of industries and governments.

Program Requirements

- Concentrations and course offerings may vary by campus and/or by program modality. Please consult with your advisor or admissions coach for the course availability each term at your campus or within your program modality.
- Certain options within the program may be *required* at certain campuses or for certain program modalities. Please consult with your advisor or admissions coach for requirements at your campus or for your program modality.

Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified and complete any additional courses needed beyond specific college and major requirements to satisfy graduation credit requirements.

Universitywide Requirements

All undergraduate students are required to complete the Universitywide Requirements (https://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/).

NUpath Requirements

All undergraduate students are required to complete the NUpath Requirements (https://catalog.northeastern.edu/undergraduate/university-academics/nupath/).

Data Science Requirements

Code	Title	Hours
Computer Science Overview		
CS 1200	First Year Seminar	1
or ECON 1000	Economics at Northeastern	
CS 1210	Professional Development for Khoury Co-op	1
or EESH 2000	Professional Development for Co-op	
Programming Sequence Pathways		
Complete one of the following options:		12
Computer Science Option		
CS 2500 and CS 2501	Fundamentals of Computer Science 1 and Lab for CS 2500	
CS 2510 and CS 2511	Fundamentals of Computer Science 2 and Lab for CS 2510	
CS 3500 and CS 3501	Object-Oriented Design and Lab for CS 3500	
Data Science Option		
DS 2000 and DS 2001	Programming with Data and Data Science Programming Practicum	
DS 2500 and DS 2501	Intermediate Programming with Data and Lab for DS 2500	
DS 3500	Advanced Programming with Data	
Computer Science Required Courses		
CS 1800 and CS 1802	Discrete Structures and Seminar for CS 1800	5
CS 3200	Introduction to Databases	4
Data Science Foundations		
DS 3000	Foundations of Data Science	4
DS 4200	Information Presentation and Visualization	4

DS 4300	Large-Scale Information Storage and Retrieval	4
DS 4400	Machine Learning and Data Mining 1	4
Khoury Elective		
With advisor approval, directed study, research, project study, and appropriate graduate-level courses may also be taken as upper-division electives.		
Complete 4 semester hours of CS, CY, DS, or IS classes that are not already required. Choose courses within the following ranges:		4
CS 2500 or higher, except CS 5010		
CY 2000 or higher, except CY 4930		
DS 2500 or higher, except DS 4900		
IS 2000 or higher, except IS 4900		

Economics Requirements

Code	Title	Hours
Required Economics Courses		
ECON 1115	Principles of Macroeconomics	4
ECON 1116	Principles of Microeconomics	4
ECON 2315	Macroeconomic Theory	4
ECON 2316	Microeconomic Theory	4
ECON 2350	Statistics for Economists	4
Economics Electives		
Complete five ECON elective courses that are found in the following ranges, with no more than two in the ECON 1200 to ECON 1999 range. Unless otherwise noted in specific combined majors, required core economics courses cannot be counted as electives by students completing Department of Economics programs:		20
ECON 1200–ECON 1999		
ECON 2990 - ECON 3559		
ECON 3561 - ECON 4689		
ECON 4900–ECON 4996		
ECON 5200–ECON 5999		
Economics Capstone		
ECON 4692	Senior Economics Seminar	4
or ECON 4997	Senior Economics Thesis	

Integrative Course Requirement

Code	Title	Hours
ECON 2560	Applied Econometrics	4

Supporting Course Requirements

Code	Title	Hours
Mathematics		
MATH 1231	Calculus for Business and Economics (It is highly recommended that students who take MATH 1231 take sections devoted to Economics students only.)	4
or MATH 1241	Calculus 1	
or MATH 1245	Calculus with Applications	
or MATH 1251	Calculus and Differential Equations for Biology 1	
or MATH 1340	Intensive Calculus for Engineers	
or MATH 1341	Calculus 1 for Science and Engineering	
Computing and Social Issues		
Complete one of the following:		4
AFCS 2600	Issues in Race, Science, and Technology	
CY 4170	The Law, Ethics, and Policy of Data and Digital Technologies	
CY 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	
HIST 2220	History of Technology	
INSH 2102	Bostonography: The City through Data, Texts, Maps, and Networks	
IS 1300	Knowledge in a Digital World	

or PHIL 1300	Knowledge in a Digital World
JRNL 3700	Data Storytelling
PHIL 1145	Technology and Human Values
SOCL 1280	The Twenty-First-Century Workplace
SOCL 2485	Environment, Technology, and Society
SOCL 4528	Technology and Society

English Requirement

Code	Title	Hours
College Writing		
ENGW 1111	First-Year Writing	4
or ENGW 1102	First-Year Writing for Multilingual Writers	
Advanced Writing in the Disciplines		
Complete one of the following:		4
ENGW 3302	Advanced Writing in the Technical Professions	
ENGW 3308	Advanced Writing in the Social Sciences	
ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Required General Electives

Code	Title	Hours
Complete 24 semester hours of general electives.		24

Khoury College GPA Requirement

Minimum cumulative 2.000 GPA required in all CS, CY, DS, and IS courses

Economics GPA Requirement

Grades in the following four courses must average to a minimum of C (2.000):

Code	Title	Hours
ECON 2315	Macroeconomic Theory	
ECON 2316	Microeconomic Theory	
ECON 2350	Statistics for Economists	
ECON 2560	Applied Econometrics	

NUpath Requirements Satisfied

- Engaging with the Natural and Designed World
- Conducting Formal and Quantitative Reasoning
- Analyzing and Using Data
- Exploring Creative Expression and Innovation
- Writing in the First Year
- Advanced Writing in the Disciplines
- Writing-Intensive in the Major
- Demonstrating Thought and Action in a Capstone

Integrating Knowledge and Skills Through Experience is satisfied through co-op.

Program Requirement

130 total semester hours required

Plan of Study

Sample Pattern: Four Years, Two Co-ops in Summer 2/Fall

Year 1							
Fall	**Hours**	**Spring**	**Hours**	**Summer 1**	**Hours**	**Summer 2**	**Hours**
CS 1200	1	DS 2500 and DS 2501	5	CS 3200	4	Elective	4
CS 1800 and CS 1802	5	Elective	4	Elective	4	Elective	4

DS 2000 and DS 2001	4	ECON 1116	4				
ECON 1115	4	MATH 1231, 1241, 1245, 1251, 1340, or 1341	4				
ENGW 1111	4						
	18		**17**		**8**		**8**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
DS 3000	4	CS 1210	1	Elective	4	Co-op	0
DS 3500	4	DS 4200	4	Elective	4		
ECON 2315	4	DS 4300	4				
ECON 2350	4	ECON 2316	4				
		ECON elective 1	4				
	16		**17**		**8**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	DS 4400	4	ENGW 3302, 3308, or 3315	4	Co-op	0
		ECON 2560	4	ECON elective 3	4		
		ECON elective 2	4				
		Khoury elective	4				
	0		**16**		**8**		**0**

Year 4

Fall	Hours	Spring	Hours
Co-op	0	ECON 4692 or 4997	4
		Computing and social issues	4
		ECON elective 4	4
		ECON elective 5	4
	0		**16**

Total Hours: 132

Sample Pattern: Four Years, Two Co-ops in Spring/Summer 1

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CS 1200	1	DS 2500 and DS 2501	5	CS 3200	4	Elective	4
CS 1800 and CS 1802	5	Elective	4	Elective	4	Elective	4
DS 2000 and DS 2001	4	ECON 1116	4				
ECON 1115	4	MATH 1231, 1241, 1245, 1251, 1340, or 1341	4				
ENGW 1111	4						
	18		**17**		**8**		**8**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CS 1210	1	Co-op	0	Co-op	0	Elective	4
DS 3000	4					Elective	4
DS 3500	4						
ECON 2315	4						
ECON 2350	4						
	17		**0**		**0**		**8**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
DS 4200	4	Co-op	0	Co-op	0	ENGW 3302, 3308, or 3315	4
DS 4300	4					ECON elective 2	4
ECON 2316	4						
ECON elective 1	4						
	16		**0**		**0**		**8**

Year 4

Fall	Hours	Spring	Hours
DS 4400	4	ECON 4692 or 4997	4
ECON 2560	4	Computing and social issues	4
Khoury Elective	4	ECON elective 4	4
ECON elective 3	4	ECON elective 5	4
	16		**16**

Total Hours: 132