Data Science, BS (Boston)

The Bachelor of Science in Data Science studies 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.

Program Requirements

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 Major Requirements

Code	Title	Hours
Computer Science Overview		
CS 1200	First Year Seminar	1
CS 1210	Professional Development for Khoury Co-op	1
Fundamental Courses		
All students can take a self-assessment to attempt to place out of CS 2000 and CS 2001. Students who place out of CS 2000 and CS 2001 will instead substitute 4-5 semester hours of CS, CY, or DS coursework at the 3000 level or higher not otherwise required in the degree.		
CS 1800 and CS 1802	Discrete Structures and Seminar for CS 1800	5
CS 2000 and CS 2001	Introduction to Program Design and Implementation and Lab for CS 2000	5
Programming Sequence Pathways		
Choose one of the following options:		9
Computer Science Option		
CS 2100 and CS 2101	Program Design and Implementation 1 and Lab for CS 2100	
CS 3100 and CS 3101	Program Design and Implementation 2 and Lab for CS 3100	
Data Science Option		
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 3000	Algorithms and Data	4
CS 3200	Introduction to Databases	4
CS 3520	Programming in C++	4
or CS 3650	Computer Systems	
Data Science Electives		
Complete three of the following:		12
CS 4100	Artificial Intelligence	
CS 4120	Natural Language Processing	
CS 4130	Engineering LLM-Integrated Systems	
CS 4220	Information Retrieval	
CY 4100	AI Security and Privacy	
Data Science Required Courses		
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
DS 4420	Machine Learning and Data Mining 2	4
or DS 4440	Practical Neural Networks	
Presentation Requirement		
Complete one of the following:		4
COMM 1112	Public Speaking	
COMM 1113	Business and Professional Speaking	
COMM 1210	Persuasion and Rhetoric	
COMM 1511	Communication and Storytelling	
THTR 1125	Improvisation	
THTR 1130	Introduction to Acting	
THTR 1180	Dynamic Presence: Theatre Training for Effective Interpersonal Interactions	
THTR 2345	Acting for the Camera	
Mathematics Foundations		
MATH 1341	Calculus 1 for Science and Engineering	4
MATH 1342	Calculus 2 for Science and Engineering	4
MATH 2331	Linear Algebra	4
MATH 3081	Probability and Statistics	4
Data Science and Ethics		
PHIL 1145	Technology and Human Values	4
Khoury Approved Electives		
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 from within the following options:		4
CS 2500 or higher, except CS 5010		
CY 2000 or higher, except CY 4930		
DS 2500 or higher, except DS 4900		
MKTG 4606	Digital, Analytics, Technology, and Automation Research Practicum	
Data Science Related Electives in Other Units		
Complete one of the following:		4
ARTG 3451	Information Design 1	
ARTG 5100	Information Design Studio 1: Principles	
ARTG 5110	Information Design History	
ARTG 5120	Research Methods for Design	
ARTG 5330	Visualization Technologies 1: Fundamentals	
ARTG 6100	Information Design Studio 2: Dynamic Mapping and Models	
BINF 6308	Bioinformatics Computational Methods 1	
BINF 6309	Bioinformatics Computational Methods 2	
CS 4350	Empirical Research Methods	
ECON 2350	Statistics for Economists	
ECON 2560	Applied Econometrics	
EECE 5639	Computer Vision	
EECE 5642	Data Visualization	
EECE 5644	Introduction to Machine Learning and Pattern Recognition	
ENVR 2500	Biostatistics	
GSND 5110	Game Design and Analysis	
GSND 6350	Data-Driven Game Design	
HINF 5101	Introduction to Health Informatics and Health Information Systems	
HINF 5102	Data Management in Healthcare	
HINF 5300	Personal Health Interface Design and Development	
HINF 5301	Evaluating Health Technologies	
IE 5640	Data Mining for Engineering Applications	

MATH 2321	Calculus 3 for Science and Engineering
MATH 4581	Statistics and Stochastic Processes
MGSC 2301	Business Statistics
MISM 3403	Data Management for Business
MKTG 3401	Marketing Research
MKTG 3501	Marketing Analytics
PHIL 5005	Information Ethics
PHIL 5010	AI Ethics
PSYC 2320	Statistics in Psychological Research
PSYC 3466	Cognition

Computer Science Writing Requirement

Code	Title	Hours
College Writing		
ENGW 1111	First-Year Writing	4
Advanced Writing in the Disciplines		
ENGW 3302	Advanced Writing in the Technical Professions	4
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Required General Electives

Code	Title	Hours
Complete 28 semester hours of general electives.		28

Khoury College GPA Requirement

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

NUpath Requirements Satisfied

- Engaging with the Natural and Designed World
- Conducting Formal and Quantitative Reasoning
- Analyzing and Using Data
- 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 Plans of Study

FOUR YEARS, TWO CO-OPS SUMMER SECOND HALF/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	MATH 2331	4
CS 1800 and CS 1802	5	MATH 1342	4	MATH 3081	4	General Elective	4
ENGW 1111	4	PHIL 1145	4				
CS 2000 and CS 2001	5	General Elective	4				
MATH 1341	4						
	19		**17**		**8**		**8**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CS 3520	4	CS 1210	1	CS 3000	4	Co-op	0

DS 3000	4	DS 4200	4	General Elective	4		
DS 3500	4	DS 4300	4				
Presentation Requirement	4	General Elective	4				
		General Elective	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	4	Co-op	0
		Data Science Elective 2	4	General Elective	4		
		Data Science Elective 1	4				
		General Elective	4				
	0		**16**		**8**		**0**

Year 4

Fall	Hours	Spring	Hours
Co-op	0	DS 4420 or 4440	4
		Data Science Related Elective	4
		Data Science Elective 3	4
		Khoury Elective	4
	0		**16**

Total Hours: 133

FOUR YEARS, TWO CO-OPS SPRING/SUMMER FIRST HALF

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CS 1200	1	DS 2500 and DS 2501	5	CS 3200	4	MATH 2331	4
CS 1800 and CS 1802	5	MATH 1342	4	MATH 3081	4	General Elective	4
ENGW 1111	4	PHIL 1145	4				
CS 2000 and CS 2001	5	General Elective	4				
MATH 1341	4						
	19		**17**		**8**		**8**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CS 1210	1	Co-op	0	Co-op	0	General Elective	4
CS 3520	4					General Elective	4
DS 3000	4						
DS 3500	4						
Presentation Requirement	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	4
DS 4300	4					General Elective	4
CS 3000	4						
General Elective	4						
	16		**0**		**0**		**8**

Year 4

Fall	Hours	Spring	Hours
DS 4400	4	DS 4420 or 4440	4

Data Science Elective 1	4	Data Science Related Elective	4
Data Science Elective 2	4	Data Science Elective 3	4
General Elective	4	Khoury Elective	4
	16		**16**

Total Hours: 133