Data Science and Mathematics, BS (Boston)

The data science and mathematics combined major combines computer science, data science, and mathematics into an integrated curriculum. The program provides the rigorous theoretical background necessary for success in the data science field.

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 Courses

Code	Title	Hours
Computer Science Overview		
Must be taken in alignment with your home college:		
CS 1200	First Year Seminar	1
or MATH 1000	Mathematics at Northeastern	
or INSC 1000	Science at Northeastern	
CS 1210	Professional Development for Khoury Co-op	1
or EESC 2000	Professional Development for Co-op	
Computer Science Required 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 with 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
CS 3200	Introduction to Databases	4
Programming Sequence Pathways		
Complete one of two 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	
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
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 8 semester hours from within the following options:		8
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

Mathematics Courses

Code	Title	Hours
Problem-Solving Requirement		
MATH 1365	Introduction to Mathematical Reasoning	4
Calculus Requirements		
MATH 1341	Calculus 1 for Science and Engineering	4
MATH 1342	Calculus 2 for Science and Engineering	4
MATH 2321	Calculus 3 for Science and Engineering	4
Intermediate and Advanced Math Requirements		
MATH 2331	Linear Algebra	4
MATH 2341	Differential Equations and Linear Algebra for Engineering	4
MATH 3081	Probability and Statistics	4
MATH 3175	Group Theory	4
MATH 3527	Number Theory 1	4
Mathematics Elective Requirements		
Complete four courses in the following range:		16
MATH 3001 to MATH 4999 but not MATH 4000		

Integrative Requirements

Code	Title	Hours
Integrative Courses		
DS 4400	Machine Learning and Data Mining 1	4
DS 4420	Machine Learning and Data Mining 2	4

Computer Science Writing Requirements

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		
ENGW 3302	Advanced Writing in the Technical Professions	4
or ENGW 3307	Advanced Writing in the Sciences	
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Required General Electives

Code	Title	Hours
Complete 20 semester hours of general electives.		20

Khoury College GPA Requirement

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

Science GPA Requirement (Mathematics)

A minimum 2.000 GPA in the following course codes is required: MATH.

NUpath Requirements Satisfied

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

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 IN 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	MATH 3081	4	General Elective	4
CS 1800 and CS 1802	5	MATH 1342	4	General Elective	4	General Elective	4
CS 2000 and CS 2001	5	MATH 1365	4				
ENGW 1111	4	General Elective	4				
MATH 1341	4						
	19		**17**		**8**		**8**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CS 3200	4	CS 1210	1	MATH 3527	4	Co-op	0
DS 3000	4	DS 3500	4	Khoury Elective	4		
MATH 2321	4	DS 4200	4				
MATH 2341	4	MATH 2331	4				
		MATH elective	4				
	16		**17**		**8**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	DS 4300	4	ENGW 3302, 3307, or 3315	4	Co-op	0
		DS 4400	4	General Elective	4		
		MATH 3175	4				
		MATH elective	4				
	0		**16**		**8**		**0**

Year 4

Fall	Hours	Spring	Hours
Co-op	0	DS 4420	4
		Khoury Elective	4
		MATH elective	4
		General Elective	4
	0		**16**

Total Hours: 133

FOUR YEARS, TWO CO-OPS IN 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	MATH 3081	4	General Elective	4
CS 1800 and CS 1802	5	MATH 1342	4	General Elective	4	General Elective	4
CS 2000 and CS 2001	5	MATH 1365	4				
ENGW 1111	4	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		Co-op		Khoury Elective	4
CS 3200	4					General Elective	4
DS 3000	4						
MATH 2321	4						
MATH 2341	4						
	17		**0**		**0**		**8**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	Co-op		Co-op		ENGW 3302, 3307, or 3315	4
DS 3500	4					General Elective	4
DS 4200	4						
MATH 2331	4						
MATH Elective	4						
	16		**0**		**0**		**8**

Year 4

Fall	Hours	Spring	Hours
DS 4300	4	DS 4420	4
DS 4400	4	MATH 3527	4
MATH 3175	4	Khoury Elective	4
MATH elective	4	MATH elective	4
	16		**16**

Total Hours: 133