

Data Science and Design, BS (Boston)

The Bachelor of Science in Data Science and Design integrates a technical degree with a practice-based discipline that poses important questions about—and provides significant answers to—how we live. Students study the collection, manipulation, storage, retrieval, and computational analysis of data in its various forms including numeric, textual, image, and video data. Information designers visualize concepts and data to enhance human understanding of complex and vital knowledge. Their work has an enlightening or instructive intent and is based on factual content.

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 Requirements

Code	Title	Hours
Computer Science Overview		
Must be taken in alignment with your home college:		
CS 1200 or ARTF 1000	First Year Seminar Art and Design at Northeastern	1
CS 1210 or EEAM 2000	Professional Development for Khoury Co-op Professional Development for Co-op	1
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 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 the following options:		9
<i>Computer Science Option</i>		
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	
<i>Data Science Option</i>		
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 4300	Large-Scale Information Storage and Retrieval	4
DS 4400	Machine Learning and Data Mining 1	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 the following:		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

Design Requirements

Code	Title	Hours
Art + Design Fundamentals Required		
ARTF 1220	Elements of Visual Composition (with optional ARTF 1221)	2
Art + Design Fundamentals Elective		
Complete 6 semester hours from the following:		6
ARTF 1200	Representational Drawing	
ARTF 1210	Abstract Drawing	
ARTF 1230 and ARTF 1231	Making with Form and Materials and Making with Form and Materials Tools	
ARTF 1240 and ARTF 1241	Making with Video, Sound, and Animation and Making with Video, Sound, and Animation Tools	
ARTF 1250 and ARTF 1251	Designing Interactive Experiences and Designing Interactive Experiences Tools	
Design Required		
ARTG 1001 and ARTG 1002	Design Perspectives: An Introduction to Design in the World and Seminar for Design Perspectives	4
ARTG 1270 and ARTG 1271	Design: Process + Practices and Studio for Design: Process + Practices	4
ARTG 1290 and ARTG 1291	Typographic Systems and Studio for Typographic Systems	4
Design Elective		
Complete 4 semester hours of ARTG courses, as long as prerequisites have been met and course has not been used to fulfill other requirements of the program.		4
Art + Design History Elective		
Complete 4 semester hours of ARTH courses.		4
Art + Design Elective		
Complete 4 semester hours of ARTD, ARTE, ARTG, ARTH, ARTS, or GAME courses as long as prerequisites have been met.		4
Degree Capstone Project		
ARTG 4550	Design Degree Project	4

Design Option

Code	Title	Hours
Complete one of the following options (information design is recommended):		8
Creative Fabrication		
ARTG 2810	Creative Fabrication Design Principles	
ARTG 3810	Topics in Creative Fabrication Inquiry	
Experience Design Option		
ARTG 3462	Experience Design Principles	
ARTG 3464	Topics In Experience Design Inquiry	
Graphic Design Option		
ARTG 2252	Graphic Design Principles	
ARTG 3452	Topics In Graphic Design Inquiry	
Information Design Option		
ARTG 2242	Information Design Principles	
ARTG 3444	Topics in Information Design Inquiry ¹	
Interaction Design Option		
ARTG 2400	Interaction Design Principles (with optional ARTG 2401)	
ARTG 3400	Topics In Interaction Design Inquiry	

¹ Instead of ARTG 3444, ARTG 5100 is recommended for students considering the PlusOne in Information Design and Data Visualization.

Integrative Requirements

Code	Title	Hours
ARTG 5330	Visualization Technologies 1: Fundamentals ¹	4
or ARTG 5150	Information Visualization Principles and Practices	
DS 4200	Information Presentation and Visualization	4

¹ For students who choose Information Visualization Principles and Practices (ARTG 5150), concurrent registration in Information Design Critique Seminar (ARTG 5151) is recommended. It is suggested students consult with their academic advisor.

Supporting Courses

Code	Title	Hours
Mathematics		
ECON 2350	Statistics for Economists	4
MATH 1341	Calculus 1 for Science and Engineering	4
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	
DS 1300	Knowledge in a Digital World	
or PHIL 1300	Knowledge in a Digital World	
HIST 2220	History of Technology	
INSH 2102	Bostonography: The City through Data, Texts, Maps, and Networks	
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	

Computer Science Writing Requirements

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 3314	Advanced Writing in the Arts, Media, and Design	
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Required General Electives

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

NUpath Requirements Satisfied

- Engaging with the Natural and Designed World
- Exploring Creative Expression and Innovation
- 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.

Khoury College GPA Requirement

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

Program Requirement

130 total semester hours required

Plan of Study

Sample Plan of Study: Four Years, Two Co-ops in Spring/Summer First-Half

Year 1							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
ARTG 1001 and ARTG 1002		4 ARTG 1290 and ARTG 1291		4 ECON 2350		4 General elective	4
ARTF 1220 (with optional ARTF 1221)	2	ENGW 1111		4 ARTF elective		2 General elective	4
CS 1200 or ARTF 1000	1	DS 2500 and DS 2501		5 ARTF elective	2		
CS 1800 and CS 1802	5	MATH 1341		4			
CS 2000 and CS 2001	5	EEAM 2000 (for CAMD students)		1			
ARTF elective	2						
	19			18		8	8
Year 2							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CS 1210 (for Khoury students)	1	Co-op		0 Co-op		0 General elective	4
DS 3500	4					General elective	4
CS 3200	4						
ARTG 1270 and ARTG 1271	4						
Design option 1	4						
	17			0		0	8
Year 3							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
DS 3000	4	Co-op		0 Co-op		0 ENGW 3302, 3314, or 3315	4
Design option 2	4					General elective	4
ARTF elective	4						
ARTG elective	4						
	16			0		0	8
Year 4							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
DS 4200		4 ARTG 4550		4			
DS 4300		4 ARTG 5330 or 5150		4			
A+D elective		4 DS 4400		4			
Computing and social issues		4 Khoury elective		4			
	16			16			

Total Hours: 134

Sample Plan of Study: Four Years, Two Co-ops in Summer Second-Half/Fall

Year 1							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
ARTG 1001 and ARTG 1002		4 ARTG 1290 and ARTG 1291		4 ECON 2350		4 General elective	4

ARTF 1220 (with optional ARTF 1221)	2	DS 2500 and DS 2501	5	ARTF elective	2	General elective	4
CS 1200 or ARTF 1000	1	MATH 1341	4	ARTF elective	2		
CS 1800 and CS 1802	5	ENGW 1111	4				
CS 2000 and CS 2001	5						
ARTF elective	2						
	19		17		8		8
Year 2							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
DS 3500	4	CS 1210	1	General elective	4	Co-op	0
CS 3200	4	DS 3000	4	General elective	4		
ARTG 1270 and ARTG 1271	4	ARTG elective	4				
Design option 1	4	ARTH elective	4				
		Computing and social issues	4				
	16		17		8		0
Year 3							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	Design option 2	4	ENGW 3302, 3314, or 3315	4	Co-op	0
		DS 4200	4	General elective	4		
		DS 4300	4				
		A+D elective	4				
	0		16		8		0
Year 4							
Fall	Hours	Spring	Hours				
Co-op	0	ARTG 4550	4				
		ARTG 5330 or 5150	4				
		DS 4400	4				
		Khoury elective	4				
	0		16				

Total Hours: 133