

# Data Science and Health Science, BS

The data science and health science combined major offers a solid academic and experiential foundation integrating studies in health administration, computer science, mathematics, and statistics. This program reflects the impact of data in modern healthcare and prepares students for success in careers in health administration, community-based health promotion, public health, and big data analysis.

## 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
<b>Computer Science Overview</b>		
Must be taken in alignment with your home college:		
CS 1200 or HSCI 1000	First Year Seminar College: An Introduction	1
CS 1210 or HSCI 2000	Professional Development for Khoury Co-op Professional Development for Bouvé Co-op	1
<b>Programming Sequence Pathways</b>		
Choose one of the two options:		12
<i>Computer Science Option</i>		
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	
<i>Data Science Option</i>		
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	
<b>Computer Science Required Courses</b>		
CS 1800 and CS 1802	Discrete Structures and Seminar for CS 1800	5
CS 3200	Introduction to Databases	4
<b>Information Science Requirement</b>		
IS 4300	Human Computer Interaction	4
<b>Data Science Foundations</b>		

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

### Supporting Courses for Data Science

Code	Title	Hours
MATH 1341 or MATH 1241	Calculus 1 for Science and Engineering Calculus 1	4

### Data Science Writing Requirement

Code	Title	Hours
<b>College Writing</b>		
ENGW 1111 or ENGW 1102	First-Year Writing First-Year Writing for Multilingual Writers	4

#### Advanced Writing in the Disciplines

ENGW 3302 or ENGW 3315	Advanced Writing in the Technical Professions Interdisciplinary Advanced Writing in the Disciplines	4
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### Health Science Requirements

Code	Title	Hours
<b>Public Health Core</b>		
PHTH 1260 or PHTH 1261	The American Healthcare System Comparative Healthcare Systems	4
PHTH 2300 or PHTH 2301	Communication Skills for the Health Professions Communication Skills for the Health Professions—Global	4
PHTH 2350 or PHTH 2351	Community and Public Health Community and Public Health - Global	4
PHTH 2515	Healthcare Policy and Administration	4
PHTH 4120	Global Perspectives on Discrimination and Health	4
PHTH 4540	Health Education and Program Planning	4

### Supporting Courses for Health Science

Code	Title	Hours
<b>Research Methods</b>		
Complete one of the following:		4
IS 4800	Empirical Research Methods	
PHTH 4202	Principles of Epidemiology in Medicine and Public Health	
<b>Statistics</b>		
Complete one of the following:		4
ECON 2350	Statistics for Economists	
ENVR 2500	Biostatistics	
MATH 3081	Probability and Statistics	
PHTH 2210	Foundations of Biostatistics	
PSYC 2320	Statistics in Psychological Research	
<b>Philosophy</b>		
Complete one of the following:		4
PHIL 1145	Technology and Human Values	
PHIL 1165	Moral and Social Problems in Healthcare	
<b>Life Sciences Core</b>		
BIOL 1111 and BIOL 1112	General Biology 1 and Lab for BIOL 1111	5
BIOL 1113 and BIOL 1114	General Biology 2 and Lab for BIOL 1113	5

CHEM 1161 and CHEM 1162 and CHEM 1163	General Chemistry for Science Majors and Lab for CHEM 1161 and Recitation for CHEM 1161	5
PSYC 1101	Foundations of Psychology	4

### Integrative Requirement

Code	Title	Hours
<b>Upper-Division Elective</b>		
Complete four 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		
HSCI 4000 or higher		
IS 2000 or higher, except IS 4900		
PHTH 4000 or higher		

### Integrative Course

DS 4420	Machine Learning and Data Mining 2	4
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### Required General Electives

Code	Title	Hours
Complete 16 semester hours general electives.		16

### Khoury College GPA Requirement

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

### Health Sciences Major Requirement

A grade of C or higher is required for all BIOL, CHEM, HLTH, HSCI, MATH, and PHTH courses.

### NUpath Requirements Satisfied

- Engaging with the Natural and Designed World
- Exploring Creative Expression and Innovation
- Interpreting Culture
- Conducting Formal and Quantitative Reasoning
- Understanding Societies and Institutions
- Analyzing and Using Data
- Engaging Differences and Diversity
- Employing Ethical Reasoning
- 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

133 semester hours required

### Plan of Study

#### Four Years, One Co-op Sample Plan of Study Summer 2/Fall

Year 1		Year 2		Year 3		Year 4	
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
BIOL 1111 and BIOL 1112		5 BIOL 1113 and BIOL 1114		5 DS 3000		4 Vacation	
CS 1200		1 DS 2500 and DS 2501		5 PHTH 2350		4	
CS 1800 and CS 1802		5 PHTH 1260		4			

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DS 2000 and DS 2001	4	PSYC 1101	4					
ENGW 1111	4							

**19** **18** **8** **0**

**Year 2**

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1161 and CHEM 1162 and CHEM 1163	5	DS 3500	4	General Elective	4	Vacation	4
CS 3200	4	DS 4200	4	General Elective	4		
MATH 1341 or 1241	4	PHTH 2300	4				
Statistics Course	4	PHTH 2515	4				

**17** **16** **8** **0**

**Year 3**

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
ENGW 3302 or 3315	4	CS 1210	1	Vacation		Co-op	0
IS 4300	4	DS 4300	4				
PHIL 1145 or 1165	4	DS 4400	4				
Upper Division Elective	4	PHTH 4202 or IS 4800	4				
		PHTH 4540	4				

**16** **17** **0** **0**

**Year 4**

Fall	Hours	Spring	Hours
Co-op	0	DS 4420	4
		PHTH 4120	4
		General Elective	4
		General Elective	4

**0** **16**

Total Hours: 135

**Four Years, One Co-op Sample Plan of Study Spring/Summer 1**

**Year 1**

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
BIOL 1111 and BIOL 1112	5	BIOL 1113 and BIOL 1114	5	DS 3000	4	Vacation	4
CS 1200	1	DS 2500 and DS 2501	5	PHTH 2350	4		
CS 1800 and CS 1802	5	PHTH 1260	4				
DS 2000 and DS 2001	4	PSYC 1101	4				
ENGW 1111	4						

**19** **18** **8** **0**

**Year 2**

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1161 and CHEM 1162 and CHEM 1163	5	DS 3500	4	General Elective	4	Vacation	4
CS 3200	4	DS 4200	4	General Elective	4		
MATH 1341 or 1241	4	PHTH 2300	4				
Statistics Course	4	PHTH 2515	4				

**17** **16** **8** **0**

<b>Year 3</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
CS 1210		1 Co-op		0 Co-op		0 Vacation	
ENGW 3302 or 3315		4					
IS 4300		4					
PHIL 1145 or 1165		4					
Upper Division Elective		4					
		<b>17</b>		<b>0</b>		<b>0</b>	<b>0</b>
<b>Year 4</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>				
DS 4300		4 DS 4420	4				
DS 4400		4 PHTH 4120	4				
PHTH 4202 or IS 4800		4 General Elective	4				
PHTH 4540		4 General Elective	4				
		<b>16</b>	<b>16</b>				
<b>Total Hours: 135</b>							