Data Science and Health Science, BS

The health science and computer 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

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 (http://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/).

NUpath Requirements

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

Data Science Requirements

Code	Title	Hours
Computer Science Overview		
CS 1200	First Year Seminar	1
or HSCI 1000	College: An Introduction	
CS 1210	Professional Development for Khoury Co-op	1
or HSCI 2000	Professional Development for Bouvé Co-op	
Programming Sequence Pathways		
Choose one of the two 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	Database Design	4
Information Science Requirement		
IS 4300	Human Computer Interaction	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

Supporting Courses for Data Science

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

Data Science Writing 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		
ENGW 3302	Advanced Writing in the Technical Professions	4
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Health Science Requirements

Code	Title	Hours
Public Health Core		
PHTH 1260	The American Healthcare System	4
or PHTH 1261	Comparative Healthcare Systems	
PHTH 2300	Communication Skills for the Health Professions	4
or PHTH 2301	Communication Skills for the Health Professions—Global	
PHTH 2350	Community and Public Health	4
or PHTH 2351	Community and Public Health - Global	
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
Research Methods		
Complete one of the following:		4
HLTH 5450	Healthcare Research	
or PHTH 4202	Principles of Epidemiology in Medicine and Public Health	
IS 4800	Empirical Research Methods	
Statistics		
Complete one of the following:		4
ECON 2350	Statistics	
ENVR 2500	Biostatistics	
MATH 3081	Probability and Statistics	
PHTH 2210	Foundations of Biostatistics	
PSYC 2320	Statistics in Psychological Research	
Philosophy		
Complete one of the following:		4
PHIL 1145	Technology and Human Values	
PHIL 1165	Moral and Social Problems in Healthcare	
Life Sciences Core		
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
Upper-Division Elective		
Complete four credits 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

Required General Electives

Code	Title	Hours
Complete 16 credits general electives.		16

Khoury College GPA Requirement

Minimum 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 Year, One Co-op Sample Plan of Study

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
BIOL 1111 and BIOL 1112	5	BIOL 1113 and BIOL 1114	5	CS 3500	4	Vacation	
CS 1200	1	CS 2510 and CS 2511	5	MATH 1341	4		
CS 1800 and CS 1802	5	PHTH 1260	4				
CS 2500 and CS 2501	5	PSYC 1101	4				
ENGW 1111	4						
	20		18		8		0

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1161 and CHEM 1162 and CHEM 1163	5	CHEM 1214 and CHEM 1215	5	General Elective	4	Vacation	
CS 3200	4	CS 1210	1	General Elective	4		
PHTH 2350	4	DS 3000	4				
Statistics Course	4	PHTH 2300	4				
		PHTH 2515	4				
	17		18		8		0

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
ENGW 3302	4	CS 1210	1	Vacation		Co-op	
IS 4300	4	DS 4200	4				
PHIL 1145 or 1165	4	DS 4300	4				
Upper Division Elective	4	DS 4400	4				
		PHTH 4202 or IS 4800	4				
	16		17		0		0

Year 4

Fall	Hours	Spring	Hours
Co-op		DS 4420	4
		PHTH 4120	4
		PHTH 4540	4
		General Elective	4
	0		16

Total Hours: 138