

Data Science and Public Health, BS

The data science and public health combined major offers students a strong foundation and experiential education integrating studies in public health and data science. The program covers the social determinants of health, biostatistics and epidemiology, health communication, and health education and program planning. Students have an opportunity to study 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

- 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
Programming Sequence Pathways		
Complete one of the following 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	
Computer Science Required Courses		
CS 1800 and CS 1802	Discrete Structures and Seminar for CS 1800	5
CS 3200	Introduction to Databases	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

Code	Title	Hours
Introduction to College		1
Must be taken in alignment with your home college:		
CS 1200	First Year Seminar	
HSCI 1000	College: An Introduction	
Ethics		
Complete one of the following:		4
BIOL 2329	Bioethics	
PHIL 1165	Moral and Social Problems in Healthcare	
Mathematics		
MATH 1341 or MATH 1241	Calculus 1 for Science and Engineering Calculus 1	4
Statistics		4-5
Complete one of the following:		
ENVR 2500 and ENVR 2501 and ENVR 2502	Biostatistics and Lab for ENVR 2500 and Recitation for ENVR 2500	
MATH 3081	Probability and Statistics	
PHTH 2210	Foundations of Biostatistics	
Professional Development		1
Must be taken in alignment with your home college:		
CS 1210	Professional Development for Khoury Co-op	
HSCI 2000	Professional Development for Bouvé Co-op	

Public Health Requirements

Code	Title	Hours
Public Health Core Courses		
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 4202	Principles of Epidemiology in Medicine and Public Health	4
PHTH 4540	Health Education and Program Planning	4
Science Core Courses		
PSYC 1101	Foundations of Psychology	4
<i>Biology</i>		8-10
Complete one of the following options:		
Option 1		
BIOL 1141 or BIOL 1143	Microbes and Society Biology and Society	
BIOL 1147	The Human Organism	
Option 2		
BIOL 1111 and BIOL 1112	General Biology 1 and Lab for BIOL 1111	
BIOL 1113 and BIOL 1114	General Biology 2 and Lab for BIOL 1113	
Social Science Selectives		7-8
<i>Introductory Course</i>		
Complete one of the following:		

ANTH 1101	Peoples and Cultures
COMM 1225	Communication Theory
ECON 1115 and ECON 1125	Principles of Macroeconomics and Recitation for ECON 1115
ECON 1116 and ECON 1126	Principles of Microeconomics and Recitation for ECON 1116
ENGL 1300	Introduction to Health and Humanities
HUSV 1101	Social Change and Human Services
INTL 1101	Globalization and International Affairs
PHIL 1101	Introduction to Philosophy
POLS 1160	International Relations
SOCL 1101	Introduction to Sociology

Upper-Level Course

Complete one of the following:

Society and Behavior

ANTH 3441	Medical Anthropology
COMM 3201	Health Communication
COMM 4102	Health Communication Campaigns
CRIM 3040	Psychology of Crime
ECON 3420	Urban Economic Issues
HLTH 5280	The (in)Visibility of (dis)Ability in Society
PHTH 5222	Health Advocacy
PSYC 3402	Social Psychology
PSYC 3404	Developmental Psychology
PSYC 3450	Learning and Motivation
SOCL 3241	Violence and Society
SOCL 3441	Sociology of Health and Illness
SOCL 4520	Race, Class, and Gender

Globalization and Global Health

AFCS 3424	Epidemiology of Pandemic Diseases and Health Disparities in the African Diaspora
ECON 3404	International Food Policy
INTL 3200 or INTL 3201	Cities in a Global Context Cities in a Global Context (Abroad)
INTL 3400	International Conflict and Negotiation
PHTH 5230	Global Health
POLS 3487	Politics of Developing Nations

Environmental Health and Climate Change

COMM 3500	Environmental Issues, Communication, and the Media
ECON 3423	Environmental Economics
INTL 5100 or PPUA 5100	Climate and Development Climate and Development
PHTH 5214	Environmental Health
PPUA 5238	Climate Change and Global Urbanization

Law, Policy, and Human Rights

ECON 3424	Law and Economics
PHIL 5001	Global Justice
PHIL 5002	Ethics and Public Policy
POLS 3307	Public Policy and Administration

Healthcare Administration and Management

ECON 3413	Health Economics and Healthcare Policy
MGMT 3340	Healthcare Management, Innovation, and Design
ORGB 3201	Organizational Behavior
PHTH 4511	Healthcare Management

PHTH 5232	Evaluating Healthcare Quality
PHTH 5234	Economic Perspectives on Health Policy

Writing Requirement

Code	Title	Hours
College Writing		
ENGW 1111 or ENGW 1102	First-Year Writing First-Year Writing for Multilingual Writers	4
Advanced Writing in the Disciplines		
ENGW 3302 or ENGW 3306 or ENGW 3315	Advanced Writing in the Technical Professions Advanced Writing in the Health Professions Interdisciplinary Advanced Writing in the Disciplines	4

Integrative Requirement

Code	Title	Hours
DS 4420	Machine Learning and Data Mining 2	4

Required General Electives

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

Public Health Major Requirement

A grade of C or higher is required for all BIOL, HSCI, and PHTH courses. A grade of C or higher is required for the courses in the Social Science Selectives.

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
- Exploring Creative Expression and Innovation
- Interpreting Culture
- Conducting Formal and Quantitative Reasoning
- Understanding Societies and Institutions
- Analyzing and Using Data
- Employing Ethical Reasoning
- Engaging Differences and Diversity
- 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 IN SUMMER 2/FALL

Year 1								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	
CS 1200 or HSCI 1000		1 DS 2500 and DS 2501		5 DS 3000		4 Vacation		
DS 2000 and DS 2001		4 ENGW 1111		4 PHTH 2350		4		
CS 1800 and CS 1802		5 PSYC 1101		4				

PHTH 1260	4	BIOL	4					
BIOL	4							
	18		17		8		0	
Year 2								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
DS 3500	4	CS 1210 or HSCI 2000	1	Elective	4	Co-op		
MATH 1341 or 1241	4	DS 4200	4	PHTH 2515	4			
Elective	4	CS 3200	4					
PHTH 2300	4	PHTH 2210	4					
		Social science introduction	4					
	16		17		8		0	
Year 3								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
Co-op		PHTH 4202	4	PHTH 4540	4	Co-op		
ENGW 3306, 3302, or 3315 ¹	4	DS 4300	4	Elective	4			
		DS 4400	4					
		Ethics	4					
	4		16		8		0	
Year 4								
Fall	Hours	Spring	Hours					
Co-op		DS 4420	4					
Elective ¹	4	PHTH 4120	4					
		Social science upper level	4					
		Elective	4					
	4		16		8		0	

Total Hours: 132

¹ Students may fulfill one course during each co-op or take two courses instead of vacation.

FOUR YEARS, TWO CO-OPS IN SPRING/SUMMER 1

Year 1								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
CS 1200 or HSCI 1000	1	DS 2500 and DS 2501	5	DS 3000	4	Vacation		
DS 2000 and DS 2001	4	ENGW 1111	4	PHTH 2350	4			
CS 1800 and CS 1802	5	PSYC 1101	4					
PHTH 1260	4	BIOL	4					
BIOL	4							
	18		17		8		0	
Year 2								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
CS 1210 or HSCI 2000	1	Co-op		Co-op		Elective		4
DS 3500	4	Elective ¹	4			PHTH 2515		4
MATH 1341 or 1241	4							
PHTH 2300	4							
PHTH 2210	4							
	17		4		0		8	
Year 3								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
DS 4200	4	Co-op		Co-op		Elective		4
CS 3200	4	ENGW 3302, 3306, or 3315 ¹	4			PHTH 4540		4

6 Data Science and Public Health, BS

Ethics	4				
Social science introduction	4				
	16		4	0	8
Year 4					
Fall	Hours	Spring	Hours		
PHTH 4202	4	DS 4420	4		
DS 4300	4	PHTH 4120	4		
DS 4400	4	Social science upper level	4		
Elective	4	Elective	4		
	16		16		

Total Hours: 132