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

Data Science Requirements		
Code	Title	Hours
Programming Sequence Pathways		
Complete one of the following option	s:	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	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

2

Introduction to College 1 Use In Earth In Ingineent with your home college: 1 CS 1200 First Year Seminar HSC1 1000 College: An Introduction Ethics Compilete one of the following: 4 SIDL 7,2309 Bioethics 4 SIDL 7,2309 Bioethics 4 SIDL 7,2309 Bioethics 4 MATH 1241 Calculus 1 for Science and Engineering of An The 1241 4 Statistics 4.5 Compilere one of the following: 4.5 STATE 1241 Calculus 1 4.5 Compilere one of the following: 4.5 Compiler one of the following: 9.0 Con	Code	Title	Hours
CS 1200	Introduction to College		1
### ### ### ### ### ### ### ### ### ##	Must be taken in alignment with your hor	ne college:	
Ethics Complete one of the following: 4 BIOL 22329 Bioethics PHIL 1165 Moral and Social Problems in Healthcare MATH 1241 Calculus 1 for Science and Engineering 4 MATH 1241 Calculus 1 4 Statistics 4-5 Complete one of the following: 1 ENVR 2500 Biostratistics 4-5 Complete one of the Following: 1 ENVR 2500 and ENVR 2501 and Lab for ENVR 2500 And ENVR 2502 and Relation for ENVR 2500 MATH 3081 Probability and Statistics PHIT 2210 Pondations of Biostatistics PHIT 2210 Pondations of Biostatistics PHIT 2210 Professional Development for Bouve Co-op Number of the Science and Engineering for Khoury Co-op HSCI 2000 Professional Development for Bouve Co-op PUBLIC Health Requirements Code Title Moral and Engineering for Khoury Co-op PHTH 2500 The American Healthcare System 4 PHTH 2501 Comparative Healthcare System	CS 1200	First Year Seminar	
Complete one of the following: Bioc 122299 Biochtics PHILL 1155 Moral and Social Problems in Healthcare Mathematics MATH 1341 Calculus 1 4 Statistics 4 Complete one of the following: Complete one of the following: ENVR 2500 Biostatistics And ENVR 2501 and Recitation for ENVR 2500 and ENVR 2501 and Lab for ENVR 2500 and Lab for ENVR 2500 And ENVR 2501 and ENVR 2502 and Recitation for ENVR 2500 And ENVR 2502 ANTH 3081 Probasinal Probability and Statistics PERMEDIATE 2510 Poundations of Biostatistics PHTH 2210 Pordessional Development for Khoury Co-op Residentification of ENVR 2500 SS 120 Pordessional Development for Rouve Co-op PUBLIC Health Requirements Code Title Hours PHTH 1250 The American Healthcare System A development for Rouve Co-op PHTH 230 Comparative Healthcare System A development for Rouve Co-op	HSCI 1000	College: An Introduction	
BIOL 12329 Bioethics Profile Tio 165 Moral and Social Problems in Healthcare	Ethics		
PHIL 1165 Moral and Social Problems in Healthcare Mathematics After ministry Calculus 1 Calculus 1 After ministry Calculus 1 After ministry	Complete one of the following:		4
MATH 1331 Calculus 1 for Science and Engineering A or MATH 1241 Calculus 1 Statistics 4.5 Complete one of the following: 4.5 ENVR 2500 Biostatistics 4.5 ENVR 2501 and Lab for ENVR 2500 and ENVR 2501 and Rectation for ENVR 2500 MATH 3081 Probability and Statistics PFTTH 2210 Forestions of Evelopment 1 FOFFICE 2000 Professional Development or Statistics PFTTH 2210 Professional Development for Khoury Co-op PRTTH 2210 Professional Development for Statistics PRTH 2210 Professional Development for Bouve Co-op PUTH 2210 Professional Development for Statistics Professional Development for Bouve Co-op PUTH 2210 Professional Development for Statistics Professional Development for Statistics <th< td=""><td>BIOL 2329</td><td>Bioethics</td><td></td></th<>	BIOL 2329	Bioethics	
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or MATH 1241 Calculus 1 Statistics 4.5 Complete one of the following: 4.5 ENVR 2500 Biostatistics and ENVR 2501 and Lab for ENVR 2500 MATH 3081 Probability and Statistics PHTH 2210 Foundations of Biostatistics Porfessional Development Must be taken in alignment with your home college: CS 1210 Professional Development for Khoury Co-op HSCI 2000 Professional Development for Bouve Co-op Public Health Requirements Title More Value Label Medit Requirements Title American Healthcare System Marc A for PHTH 1260 The American Healthcare System 4 Or PhTH 1270 Communication Skills for the Health Professions 4 Or PHTH 1280 Communication Skills for the Health Professions-Global PHTH 1280 Communication Skills for the Health Professions-Global PHTH 2301 Communication Skills for the Health Professions-Global	Mathematics		
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or PHTH 2301 Communication Skills for the Health Professions—Global PHTH 2350 Community and Public Health 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 4202 Principles of Epidemiology in Medicine and Public Health 4 PHTH 4500 Health Education and Program Planning 4 Science Core Courses PSYC 1101 Foundations of Psychology 4 Biology 8-10 Complete one of the following options: Option 1 BIOL 1141 Microbes and Society 8-10 BIOL 1147 The Human Organism		· · · · · · · · · · · · · · · · · · ·	4
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and BIOL 1114 and Lab for BIOL 1113 Social Science Selectives Introductory Course and Lab for BIOL 1113 7-8	BIOL 1113	General Biology 2	
Introductory Course	and BIOL 1114		
	Social Science Selectives		7-8
Complete one of the following:	Introductory Course		
	Complete one of the following:		

	'	Data Science and Public Health, BS	3
ANTH 1101	Peoples and Cultures		
COMM 1225	Communication Theory		
ECON 1115	Principles of Macroeconomics		
and ECON 1125	and Recitation for ECON 1115		
ECON 1116	Principles of Microeconomics		
and ECON 1126	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 Diaspora	he African	
ECON 3404	International Food Policy		
INTL 3200	Cities in a Global Context		
or INTL 3201	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	Tollies of Developing Nations		
COMM 3500	Environmental Issues, Communication, and the Media		
ECON 3423	Environmental Economics		
INTL 5100	Climate and Development		
or PPUA 5100	Climate and Development		
PHTH 5214	Environmental Health		
PPUA 5238	Climate Change and Global Urbanization		
Law, Policy, and Human Rights	omnate onunge and olopar orbanization		
ECON 3424	Law and Economics		
PHIL 5001	Global Justice		
PHIL 5002	Ethics and Public Policy		
POLS 3307	Public Policy and Administration		
Healthcare Administration and Managemen	-		
ECON 3413	Health Economics and Healthcare Policy		
MGMT 3340	Healthcare Management, Innovation, and Design		
ORGB 3201	Organizational Behavior		
PHTH 4511	Healthcare Management		
. 11111 7011	Treatment wanagement		

Data Science and Public Health, BS

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

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 3306	Advanced Writing in the Health Professions	
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	
01 211011 0010	meralospiniary havanoca withing in the biospinics	

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 g	jeneral 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 CS 1200 or HSCI 1000	Hours	Spring 1 DS 2500 and DS 2501	Hours	Summer 1 5 DS 3000	Hours	Summer 2 4 Vacation	Hours
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
DS 3500		4 CS 1210 or HSCI 2000		1 Elective		4 Со-ор	
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	n	4			
		16		17		8	0
Year 3							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Со-ор		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				
Со-ор		DS 4420		4			
Elective ¹		4 PHTH 4120		4			
		Social science upper level		4			
		Elective		4			
		4		16			

Total Hours: 132

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

Year 1	r 1
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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
Fall CS 1210 or HSCI 2000	Hours	Spring 1 Co-op	Hours	Summer 1 Co-op	Hours	Summer 2 Elective	Hours 4
	Hours		Hours		Hours		
CS 1210 or HSCI 2000	Hours	1 Co-op	Hours	Со-ор	Hours	Elective	4
CS 1210 or HSCI 2000 DS 3500	Hours	1 Co-op 4 Elective ¹	Hours	Со-ор	Hours	Elective	4
CS 1210 or HSCI 2000 DS 3500 MATH 1341 or 1241	Hours	1 Co-op 4 Elective ¹	Hours	Со-ор	Hours	Elective	4
CS 1210 or HSCI 2000 DS 3500 MATH 1341 or 1241 PHTH 2300		1 Co-op 4 Elective ¹ 4	Hours	Со-ор	Hours	Elective	4
CS 1210 or HSCI 2000 DS 3500 MATH 1341 or 1241 PHTH 2300		1 Co-op 4 Elective ¹ 4 4	Hours	Co-op 4	Hours	Elective PHTH 2515	4
CS 1210 or HSCI 2000 DS 3500 MATH 1341 or 1241 PHTH 2300 PHTH 2210		1 Co-op 4 Elective ¹ 4 4	Hours	Co-op 4	Hours	Elective PHTH 2515	4
CS 1210 or HSCI 2000 DS 3500 MATH 1341 or 1241 PHTH 2300 PHTH 2210 Year 3		1 Co-op 4 Elective ¹ 4 4 7		Co-op 4		Elective PHTH 2515	8

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

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