Data Science and Linguistics, BS

The data science and linguistics combined major provides students with extensive background in the formal structures of natural (human) languages and in the collection, manipulation, storage, retrieval, and computational analysis of data in its various forms. The program teaches the methods and applications of linguistic and psycholinguistic analyses of human language data combined with skills in big data analysis, data science, and data analytics. The major provides excellent preparation for work or more advanced degrees focusing on computational linguistics, natural language processing, machine learning, and a wide array of related fields.

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/).

Computer Science Courses

Code	Title	Hours
Computer Science Overview		
CS 1200	First Year Seminar	1
or LING 1000	Linguistics at Northeastern	
CS 1210	Professional Development for Khoury Co-op	1
or EESC 2000	Professional Development for Co-op	
Programming Sequence Pathways		
Choose one of 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
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
DS 4420	Machine Learning and Data Mining 2	4
Khoury Elective Course		
With adviser approval, directed study, research, project study, and appropriate graduate-level courses may also be taken as upper-division electives.		
Complete four credits of CS, CY, DS, or IS classes that are not already required. Choose courses within the following ranges:		4

| CS 2500 or higher, except CS 5010 |
| CY 2000 or higher, except CY 4930 |
| DS 2500 or higher, except DS 4900 |
| IS 2000 or higher, except IS 4900 |

Linguistics Requirements

Code	Title	Hours
Linguistics Foundations		
LING 1150	Introduction to Language and Linguistics	4
LING 2350	Linguistic Analysis	4
LING 3412	Language and Culture	4
Linguistic Structure		
Complete three of the following:		12
LING 3420	Phonetics	
LING 3422	Phonology	
LING 3424	Morphology	
LING 3450	Syntax	
LING 3452	Semantics	
Psychology Requirements		
PSYC 1101	Foundations of Psychology	4
PSYC 2320	Statistics in Psychological Research	4
PSYC 3464	Psychology of Language	4
Laboratory/Directed Study		
Complete one of the following:		4
LING 4891	Research Seminar in Linguistics	
LING 4991	Directed Study Research	
PSYC 4610	Laboratory in Psycholinguistics	
Seminar Requirement		
LING 4654	Seminar in Linguistics	4
or PSYC 4658	Seminar in Psycholinguistics	
Linguistics Elective		
Complete one LING course, not counted elsewhere, numbered 3000−4799, or one of the following:		4
DEAF 2700	ASL Linguistics	
PSYC 3466	Cognition	
PSYC 4522	Psychology of Reading	
PSYC 4524	Cognitive Development	
PSYC 4610	Laboratory in Psycholinguistics	
PSYC 4658	Seminar in Psycholinguistics	
PSYC 4660	Seminar in Cognition	
PSYC 4674	Seminar in Cognitive Neuroscience	
With prior approval, directed study research, independent study, and Honors Project courses can also be counted:		
LING 4891	Research Seminar in Linguistics	
LING 4970	Junior/Senior Honors Project 1	
LING 4971	Junior/Senior Honors Project 2	
LING 4991	Directed Study Research	
PSYC 4991	Directed Study Research	

Supporting Courses

Code	Title	Hours
Mathematics Requirement		
MATH 1341	Calculus 1 for Science and Engineering	4

Integrative Requirement

Code	Title	Hours
Integrative Course		
CS 4120	Natural Language Processing	4

Computer Science Writing Requirement

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 3307	Advanced Writing in the Sciences	
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Required General Electives

Code	Title	Hours
Complete 20 credits of general electives.		20

Khoury College GPA Requirement

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

NUpath Requirements Satisfied

- Engaging with the Natural and Designed World
- Interpreting Culture
- Conducting Formal and Quantitative Reasoning
- Understanding Societies and Institutions
- Analyzing and Using Data
- 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 Plan 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	1	CS 2510 and CS 2511	5	CS 3500 and CS 3501	5	Elective	4
CS 1800 and CS 1802	5	CS 3200	4	PSYC 1101	4	Elective	4
CS 2500 and CS 2501	5	LING 2350	4				
ENGW 1111	4	MATH 1341	4				
LING 1150	4						
	19		17		9		8

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
DS 3000	4	CS 1210	1	PSYC 2320	4	Co-op	
LING 3412	4	DS 4200	4	Elective	4		

PSYC 3464		4	Linguistic structure		4				
Linguistic structure		4	LING elective		4				
			Elective		4				
		16			17		8		0

Year 3

Fall	Hours		Spring	Hours		Summer 1	Hours	Summer 2	Hours
Co-op			CS 4120		4	ENGW 3302	4	Co-op	
			DS 4300		4	Elective	4		
			DS 4400		4				
			Linguistic structure		4				
	0				16		8		0

Year 4

Fall	Hours		Spring	Hours
Co-op			DS 4420	4
			Khoury elective	4
			LING lab (or directed study)	4
			LING seminar	4
	0			16

Total Hours: 134