Data Science, MS—Align (Silicon Valley)

Khoury College of Computer Sciences and the Department of Electrical and Computer Engineering jointly offer an interdisciplinary Master of Science in Data Science. This program is designed to give students a comprehensive framework for reasoning about data. Students engage in extensive coursework intended to develop depth in data collection, storage, retrieval, manipulation, visualization, modeling, and interpretation. Students are also able to choose elective courses from a variety of offerings in Khoury, the College of Engineering, and throughout the campus to explore areas that generate data or specialized data science applications. Successful program graduates are well positioned to attain data scientist and data engineer positions in a fast-growing field or to progress into doctoral degrees in related disciplines.

During the admissions process, applicants take a pretest to determine if the Master of Science in Data Science (https://catalog.northeastern.edu/graduate/computer-information-science/computer-science/data-science-ms-sjo/) or Master of Science in Data Science—Align fits better with their current skill level. In addition, prospective applicants work with recruitment and enrollment coaching teams to select the appropriate program before applying.

The Master of Science in Data Science—Align curriculum is specifically designed to prepare incoming students without any prior programming experience. During the first semester of year one, students are expected to take foundational courses in computer science fundamentals, as well as a course in data structures/discrete mathematics. During their second semester, students will take coursework in programming for data science, as well as linear algebra and probability.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Students should refer to the course numbering table for graduate course leveling (https://catalog.northeastern.edu/graduate/academic-policies-procedures/records-transcripts/).

Align Bridge Coursework

Students are required to complete all bridge courses unless otherwise determined by the program.

A grade of B or higher is required in each course.

Code	Title	Hours
Fundamentals		
CS 5001 and CS 5003	Intensive Foundations of Computer Science and Recitation for CS 5001	4
Discrete Structures		
CS 5002	Discrete Structures	4
Programming for Data Science		
DS 5010	Introduction to Programming for Data Science	4
Additional Align Coursework		
DS 5020	Introduction to Linear Algebra and Probability for Data Science	4

Core Requirements

A cumulative GPA of 3.000 or higher is required in the following core courses:

Code	Title	Hours
Algorithms		
Complete 4 semester hours from the following:		4
CS 5800	Algorithms	
EECE 7205	Fundamentals of Computer Engineering	
Data Management and Processing		
DS 5110	Essentials of Data Science	4
Machine Learning and Data Mining		
DS 5220	Supervised Machine Learning and Learning Theory	4
DS 5230	Unsupervised Machine Learning and Data Mining	4
Presentation and Visualization		
DS 5500	Data Science Capstone	4

Electives [1]

Code	Title	Hours
Complete 12 semester hours from the following:		12
Khoury College of Computer Sciences		
CS 5100	Foundations of Artificial Intelligence	
CS 5180	Reinforcement Learning and Sequential Decision Making	
CS 5200	Database Management Systems	
CS 5330	Pattern Recognition and Computer Vision	
CS 5340	Computer/Human Interaction	
CS 5610	Web Development	
CS 6120	Natural Language Processing	
CS 6200	Information Retrieval	
CS 6240	Large-Scale Parallel Data Processing	
CS 6350	Empirical Research Methods	
CS 6620	Fundamentals of Cloud Computing	
CS 6650	Building Scalable Distributed Systems	
CS 7140	Advanced Machine Learning	
CS 7150	Deep Learning	
CS 7180	Special Topics in Artificial Intelligence	
CS 7200	Statistical Methods for Computer Science	
CS 7250	Information Visualization: Theory and Applications	
CS 7280	Special Topics in Database Management	
CS 7290	Special Topics in Data Science	
DS 5983	Topics in Data Science	
DS 7990	Thesis	
DS 7995	Project	
College of Engineering		
CIVE 7100	Time Series and Geospatial Data Sciences	
EECE 5612	Statistical Inference: An Introduction for Engineers and Data Analysts	
EECE 5639	Computer Vision	
EECE 5640	High-Performance Computing	
EECE 5645	Parallel Processing for Data Analytics	
EECE 7337	Information Theory	
EECE 7370	Advanced Computer Vision	
EECE 7397	Advanced Machine Learning	
IE 6700	Data Management for Analytics	
IE 7280	Statistical Methods in Engineering	
College of Social Sciences and Humanities		
ECON 5140	Applied Econometrics	
PPUA 5261	Dynamic Modeling for Environmental Decision Making	
PPUA 5262	Big Data for Cities	
PPUA 5263	Geographic Information Systems for Urban and Regional Policy	
PPUA 5266	Urban Theory and Science	
PPUA 7237	Advanced Spatial Analysis of Urban Systems	
College of Science		
ENVR 5563	Advanced Spatial Analysis	
PHYS 5116	Network Science 1	
PHYS 7305	Statistical Physics	
PHYS 7321	Computational Physics	
Bouvé College of Health Sciences		
PHTH 5202	Introduction to Epidemiology	
PHTH 5210	Biostatistics in Public Health	
PHTH 6224	Social Epidemiology	

College of Arts, Media and Design	
GSND 5110	Game Design and Analysis
GSND 6350	Data-Driven Game Design

Program Credit/GPA Requirements

40–48 total semester hours required

Minimum 3.000 GPA required

[1]   Students taking electives worth less than 4 SH (i.e., Bouvé courses) should enroll for an accompanying data science project course in the same semester to bring the cumulative SH to 4. In order to earn this additional 1 SH, students are expected to work with faculty to design an additional project in line with the curricular aims of their chosen elective and the data science core learning outcomes.