ANALYTICS AND DATA SCIENCE MAJOR: DATA SCIENCE OPTION (B.S.) MANCHESTER

https://manchester.unh.edu/program/bs/analytics-data-science-majordata-science-option

Description

The option in Data Science is intended for students interested in pursuing advanced degrees and conducting original research in data science. The option in data science places its emphasis on a rigorous introduction to the theoretical mathematical and computational underpinnings of modern data science.

During the course of the program, students will demonstrate their acquisition of these skills by successfully completing their program coursework, their internship experience, and their capstone project.

For additional information about the Analytics and Data Science: Data Science Option, contact program coordinator <u>Jeremiah Johnson</u> (Jeremiah.Johnson@unh.edu) or the <u>UNH Manchester Office of</u> <u>Admissions (unhm.admissions@unh.edu)</u> at (603) 641-4150.

Requirements

Degree Requirements

Minimum Credit Requirement: 128 credits

Minimum Residency Requirement: 32 credits must be taken at UNH

Minimum GPA: 2.0 required for conferral*

Core Curriculum Required: Discovery & Writing Program Requirements

Foreign Language Requirement: No

All Major, Option and Elective Requirements as indicated. *Major GPA requirements as indicated.

Major Requirements

Successful completion of the program entails earning at least 128 credits, meeting the requirements of the University's Discovery program, and completing all of the 18 required courses in the major as listed below. In all major courses, the minimum allowable grade is a C-. The minimum overall GPA for graduation is 2.0. Transfer students may transfer up to a maximum of 32 credits to satisfy major requirements (not counting those courses used to satisfy Discovery requirements).

Students who enroll in the Data Science Option may need to take some required courses on the Durham campus.

Code	Title	Credits
Mathematics		
MATH 425	Calculus I	4
MATH 426	Calculus II	4
MATH 528	Multidimensional Calculus	4

Total Credits		80
Select Approved Minor ¹		
or CS 799	Thesis	
& CS 792	and Senior Project II	
or CS 791	Senior Project I	
DATA #790	Canstone Project	-
Analytics Course Capstone	rocolona and reennear writing	4
ENGL 502	Professional and Technical Writing	4
English	introduction to bata objence and Analytics	4
	Introduction to Data Science and Analytics	4
Analytics & Data Science		4
COMP 720	Auguntations	4
Q DATA 0/5	Algorithms	4
or DATA 674	Predictive and Prescriptive Analytics I	
& DATA 674	and Predictive and Prescriptive Analytics I	
or COMP 740	Machine Learning Applications and Tools	
& MATH 738	and Data Mining and Predictive Analytics	0
COMP 740	Machine Learning Applications and Tools	4
CS 659	Introduction to the Theory of Computation	4
CS 420	Foundations of Programming for Digital Systems	4
or CS 515	Data Structures and Introduction to Algorithms	4
OMD 625	Deta Structures and Algorithms	4
CUMP 525	Data Structures Fundamentals	4
or CS 415	Introduction to Computer Science I	
COMP 424	Applied Computing 1: Foundations of Programming	4
Computing		
MATH 756	Principles of Statistical Inference	4
MATH 755	Probability with Applications	4
MATH 645	Linear Algebra for Applications	4
COMP 570	Statistics in Computing and Engineering	4
MATH 531	Mathematical Proof	4

Select an approved minor in consultation with the minor supervisor. Must be in a discipline to which Analytics and Data Science can be applied (examples include: Economics, Applied Mathematics) for the Data Science Option.

Degree Plan

This degree plan is a sample and does not reflect the impact of transfer credit or current course offerings. UNH Manchester undergraduate students will develop individual academic plans with their professional advisor during the first year at UNH.

Sample Course Sequence

First Year		
Fall		Credits
MATH 425	Calculus I	4
COMP 424 or CS 415	Applied Computing 1: Foundations of Programming or Introduction to Computer Science I	4
ENGL 401	First-Year Writing	4
Discovery Course		4
Spring	Credits	16
MATH 426	Calculus II	4
COMP 525 or CS 416	Data Structures Fundamentals or Introduction to Computer Science II	4

	Total Credits	120
	Credits	16
Discovery Course		4
Minor Course		4
Minor Course		4
Minor Course		4
Spring		
	Credits	8
Discovery Course		
Minor Course		
DATA #790	Capstone Project	4
CS 758	Algorithms	4
Fall		
Fourth Year		
	Credits	16
Discovery Course		4
CS 755	Computer Vision	4
CS 750	Machine Learning ¹	4
MATH 756	Principles of Statistical Inference	4
Spring		
	Credits	16
Discovery Course		4
Minor Course	, , , , , , , , , , , , , , , , , , ,	4
MATH 738	Data Mining and Predictive Analytics ¹	4
MATH 755	Probability with Applications	4
Fall		
Third Year		
	Credits	16
Discovery Course		4
MATH 528	Multidimensional Calculus	4
CS 659	Introduction to the Theory of Computation	4
or MATH 644	or Statistics for Engineers and Scientists	-
COMP 570	Statistics in Computing and Engineering	4
Spring		10
	Credits	16
ENGL 502	Professional and Technical Writing	Α
or CS 515	or Data Structures and Introduction to	
COMP 625	Data Structures and Algorithms	4
MATH 531	Mathematical Proof	4
MATH 645	Linear Algebra for Applications	4
Fall		
Second Year		
	Credits	16
03 420	Systems	4
CS 420	Analytics	1
or CS 457	or Introduction to Data Science and	
DATA 557	Introduction to Data Science and Analytics	4

¹ Either MATH 738 and CS 750, or DATA 674 and DATA 675, or DATA 674 and CS 750.

Student Learning Outcomes

Analytics and Data Science focuses on the extraction of meaning from data through the application of computer science, mathematics and business domain knowledge. Within a few years of obtaining a bachelor's degree in Analytics and Data Science, our alumni will have:

- Engaged in successful career areas of analytics and data science and will already have, or be pursuing, advanced degrees in Analytics, Data Science, Computer Science, Mathematics or related fields
- Applied the full range of core Data Science concepts and techniques to fill the analytics needs of an organization
- Communicated effectively with diverse stakeholders as well as functioned appropriately in a team environment
- Navigated the complex interconnections between data, computing technology, and the goals and constraints of the organization served
- Understood the pervasive and changing role of data in global society, and participated responsibly as both an Analytics and Data Science professional and citizen