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

https://ceps.unh.edu/computer-science/program/bs/analytics-data-science-major-data-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.

Program Objectives

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:

1. 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
2. Applied the full range of core Data Science concepts and techniques to fill the analytics needs of an organization
3. Communicated effectively with diverse stakeholders as well as functioned appropriately in a team environment
4. Navigated the complex interconnections between data, computing technology, and the goals and constraints of the organization served
5. Understood the pervasive and changing role of data in global society, and participated responsibly as both an Analytics and Data Science professional and citizen

For additional information about the Analytics and Data Science: Analytics Option, contact Matt Magnusson (matthew.magnusson@unh.edu), program co-director (Durham campus), or Jeremiah Johnson (jeremiah.johnson@unh.edu), program co-director (Manchester campus), at (603) 641-4127.

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, completing all of the 20 required courses in the major as listed below, including the capstone course, the internship preparedness course, and a three-credit internship. 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).

Code	Title	Credits
Mathematics		
MATH 425	Calculus I	4
MATH 426	Calculus II	4
MATH 528	Multidimensional Calculus	4
MATH 531	Mathematical Proof	4
MATH 539	Introduction to Statistical Analysis	4
or MATH 644	Statistics for Engineers and Scientists	
or COMP 570	Statistics in Computing and Engineering	
MATH 645	Linear Algebra for Applications	4
MATH 755	Probability with Applications	4
MATH 756	Principles of Statistical Inference	4
Computer Science		
CS 400	Introduction to Computing	2
CS 415	Introduction to Computer Science I	4
or CS 410P	Introduction to Scientific Programming/Python	
or COMP 424	Applied Computing 1: Foundations of Programming	
CS 416	Introduction to Computer Science II	4
or COMP 525	Data Structures Fundamentals	
CS 420	Foundations of Programming for Digital Systems	4
CS 457	Introduction to Data Science and Analytics	4
or DATA 557	Introduction to Data Science and Analytics	
CS 515	Data Structures and Introduction to Algorithms	4
or COMP 625	Data Structures and Algorithms	
CS 659	Introduction to the Theory of Computation	4
CS 750 & MATH 738	Machine Learning and Data Mining and Predictive Analytics	8
or DATA 674 & DATA 675	Predictive and Prescriptive Analytics I and Predictive and Prescriptive Analytics II	
or DATA 674 & CS 750	Predictive and Prescriptive Analytics I and Machine Learning	
CS 758	Algorithms	4
CS 775	Database Systems	4
English		
ENGL 502	Professional and Technical Writing	4
Analytics Course Capstone:		
DATA #790	Capstone Project [1]	4
or CS 791 & CS 792	Senior Project I and Senior Project II	
or CS 799	Thesis	
Select Approved Minor [2]		**20**
Total Credits		**102**

1. Fulfills capstone requirement
2. Minor must be approved by an academic advisor and must be in a discipline to which Analytics & Data Science can be applied (i.e. Economics or Applied Mathematics).

Student Learning Outcomes

- Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Communicate effectively in a variety of professional contexts.
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- Apply theory, techniques, and tools throughout the data analysis lifecycle and employ the resulting knowledge to satisfy stakeholders' needs.