DATA SCIENCE MAJOR (B.S.)

Description

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

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 degree program includes earning a minimum of 128 credits, meeting the requirements of the University's Discovery Program, completing all of the 20 required courses in the major as listed below, capstone course, and a minor approved by the advisor.

In all major courses, a minimum grade of C- must be earned. 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
Required Courses		
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	
MATH 645	Linear Algebra for Applications	4
or MATH 545	Introduction to Linear Algebra	
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	
CS 416	Introduction to Computer Science II	4
CS 420	Foundations of Programming for Digital Systems	4
CS 457	Introduction to Data Science and Analytics	4
CS 515	Data Structures and Introduction to Algorithms	4
CS 659	Introduction to the Theory of Computation	4
CS 674 & CS 675	Fundamentals of Statistical Learning I and Fundamentals of Statistical Learning II	8
or CS 674 & CS 750	Fundamentals of Statistical Learning I and Machine Learning	
CS 758	Algorithms	4
IT 630	Data Science and Big Data Analytics	4
or CS 775	Database Systems	
Capstone		
CS 791 & CS 792	Senior Project I and Senior Project II	4
or CS 799	Thesis	
Select an Approved Minor [1]		
Complete five (5) additional courses		20
Total Credits		**98**

[1] 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).
Instead of a minor, students may complete four (4) 600/700-level CS or MATH courses plus one (1) general elective. The additional general elective is required to meet the minimum 128 credits needed for graduation.

Degree Plan

Sample Degree Plan

This sample degree plan serves as a general guide; students collaborate with their academic advisor to develop a personalized degree plan to meet their academic goals and program requirements.

First Year		
Fall		**Credits**
CS 400	Introduction to Computing	2
CS 415	Introduction to Computer Science I	4
CS 457	Introduction to Data Science and Analytics	4
MATH 425	Calculus I	4
ENGL 401	First-Year Writing	4
	Credits	**18**
Spring		
CS 416	Introduction to Computer Science II	4
CS 420	Foundations of Programming for Digital Systems	4
MATH 426	Calculus II	4
Discovery Course		4
	Credits	**16**
Second Year		
Fall		
CS 515	Data Structures and Introduction to Algorithms	4
MATH 531	Mathematical Proof	4
MATH 645 or MATH 545	Linear Algebra for Applications or Introduction to Linear Algebra	4
Discovery Lab		4
	Credits	**16**
Spring		
MATH 539 or MATH 644	Introduction to Statistical Analysis or Statistics for Engineers and Scientists	4
MATH 528	Multidimensional Calculus	4
Minor Elective I		4

Discovery		4
	Credits	**16**
Third Year		
Fall		
CS 659	Introduction to the Theory of Computation	4
CS 674	Fundamentals of Statistical Learning I	4
Minor Elective II		4
Discovery		4
	Credits	**16**
Spring		
CS 758	Algorithms	4
CS 675 or CS 750	Fundamentals of Statistical Learning II or Machine Learning	4
Minor Elective III		4
Discovery Course		4
	Credits	**16**
Fourth Year		
Fall		
CS 791	Senior Project I	2
MATH 755	Probability with Applications	4
IT 630	Data Science and Big Data Analytics	4
Minor Elective IV		4
Discovery		4
	Credits	**18**
Spring		
CS 792	Senior Project II	2
MATH 756	Principles of Statistical Inference	4
Minor Elective V		4
Discovery		4
	Credits	**14**
	Total Credits	**130**

Student Learning Outcomes

Program 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.