# ANALYTICS AND DATA SCIENCE MAJOR (B.S.)

http://manchester.unh.edu/academics/degree-programs/analytics

## Description

The analytics and data science bachelor of science program, fully available on both Manchester and Durham campuses, is designed to prepare the next generation of data scientists and analytics professionals through a multidisciplinary program that incorporates experiential education, professional development, and project and work experience at a greater level than that typically seen in a bachelor of science program.

The analytics and data science bachelor of science program prepares graduates with the knowledge, skills, and best practices for working in data-intensive roles in industry. Graduates will be prepared to become leaders in data-driven decision-making. The program also prepares graduates to further their studies at the graduate level. Career opportunities are varied, and may include roles such as data engineer, data scientist, business analyst, marketing analyst, quantitative analyst, consultant, and actuary, though this is only a partial list. Career options exist in a wide range of organizations and will expand as more and more industries, governmental organizations, and nonprofits develop, use, and integrate data-driven decision-making processes.

Data scientists and business analysts are often most effective when they have some discipline-specific background or expertise. To assist students in the program in attaining such expertise, departments and programs at the University of New Hampshire will be invited to identify approximately two courses in their program that will provide students an appropriate foundation in their discipline. These courses may already exist, or the program can choose to create them. At least one of the specialization courses must contain a data analysis element. For example, if a student wished to complete a bachelor of science in analytics and data science with a specialization in finance, the student would complete the core analytics curriculum, and would select for their elective/specialization courses the set of courses identified by the business program as providing the foundational knowledge necessary for working in finance. In this way, students can tailor their analytics and data science B.S. degree to suit their interests.

## Program Objectives

This program has been designed to prepare students for professional careers working with data, with an emphasis on the extraction of meaning from data. The program is not targeted to any one industry; rather, it provides a flexible, practical skillset that can be applied widely. This skillset includes elements of computer science, applied mathematics and statistics, communication skills, and business savvy. Graduates of the bachelor of science in analytics and data science program are expected to have:

- An understanding of the role of data in guiding decision-making in industry
- An understanding of how data is generated, stored, and accessed
- An understanding of data security
- An understanding of the ethical use of data
- An understanding of structured vs. unstructured data
- An understanding of the methods, statistical and other, used to derive actionable information from data
- Experience with multiple programming languages
- Experience with multiple statistical and data analysis software programs
- The ability to communicate detailed, technical information to a variety of audiences clearly and concisely, without the use of jargon
- The ability to work effectively, both as an individual or as a member of a team
- The ability to successfully lead a team
- The ability to adapt to a dynamic, rapidly changing work environment
- Completed projects and other work experiences on a larger scale than is typical in a bachelor's degree program.

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.

## 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).

## Requirements - Manchester Campus

| | | |
|---|---|---|
| **Mathematics** | | |
| MATH 425 | Calculus I | 4 |
| MATH 426 | Calculus II | 4 |
| MATH 545 | Introduction to Linear Algebra | 4 |
| or MATH 645 | Linear Algebra for Applications | |
| MATH 739 | Applied Regression Analysis | 4 |
| **Computer Science** | | |
| COMP 425 | Introduction to Programming | 4 |
| COMP 430 | Systems Fundamentals | 4 |
| COMP 490 | Statistics in Computing and Engineering | 4 |
| COMP 520 | Database Design and Development | 4 |
| COMP 525 | Data Structures Fundamentals | 4 |
| **Business** | | |
| BUS 400 | Introduction to Business | 4 |
| BUS 453 | Leadership for Managers | 4 |
| BUS 620 | Organizational Behavior | 4 |
| **English** | | |
| ENGL 502 | Professional and Technical Writing | 4 |
| **Analytics Courses** | | |
| DATA 557 | Introduction to Data Science and Analytics | 4 |
| DATA 674 | Predictive and Prescriptive Analytics I | 4 |
| DATA 675 | Predictive and Prescriptive Analytics II | 4 |
| DATA 757 | Big Data | 4 |
| DATA 790 | Capstone Project | 4 |

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| **Professional Development Courses** | | |
| UMST 599 | Special Topics | 1 |
| DATA 690 | Internship Experience | 3 |
| Total Credits | | 76 |

## Requirements - Durham Campus

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|---|---|---|
| **Mathematics** | | |
| MATH 425 | Calculus I | 4 |
| MATH 426 | Calculus II | 4 |
| MATH 545 | Introduction to Linear Algebra | 4 |
| or MATH 645 | Linear Algebra for Applications | |
| MATH 739 | Applied Regression Analysis | 4 |
| **Computer Science** | | |
| CS 415 | Introduction to Computer Science I | 4 |
| or CS 416 | Introduction to Computer Science II | |
| ECE 401 | Perspectives in Electrical and Computer Engineering | 4 |
| MATH 539 | Introduction to Statistical Analysis | 4 |
| or MATH 644 | Statistics for Engineers and Scientists | |
| IT 505 | Database Programming | 4 |
| CS 515 | Data Structures | 4 |
| **Business** | | |
| ADMN 400 | Introduction to Business | 4 |
| BUS 453 | Leadership for Managers | 4 |
| MGT 580 | Introduction to Organizational Behavior | 4 |
| **English** | | |
| ENGL 502 | Professional and Technical Writing | 4 |
| **Analytics Courses** | | |
| DATA 557 | Introduction to Data Science and Analytics | 4 |
| DATA 674 | Predictive and Prescriptive Analytics I | 4 |
| DATA 675 | Predictive and Prescriptive Analytics II | 4 |
| DATA 757 | Big Data | 4 |
| DATA 790 | Capstone Project | 4 |
| **Professional Development Courses** | | |
| UMST 599 | Special Topics | 1 |
| DATA 690 | Internship Experience | 3 |
| Total Credits | | 76 |

For additional information about the analytics and data science program, contact Jeremiah Johnson, program coordinator, (603) 641-4127, jeremiah.johnson@unh.edu or contact the UNH Manchester Office of Admissions, (603) 641-4150, unhm.admissions@unh.edu.