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

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

Description

The option in Analytics is intended for students interested in either heading into industry immediately upon graduation, or pursuing graduate work in a professionally oriented program at UNH. The option in Analytics places its emphasis on applications of data science in industry.

This program has been designed to prepare students for professional careers working with data, with an emphasis on the extraction of meaning from data. This skillset includes elements of computer science, applied mathematics and statistics, communication skills, and business savvy. 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, contact program coordinator Jeremiah Johnson (Jeremiah.Johnson@unh.edu) or the UNH Manchester Office of Admissions (unhm.admissions@unh.edu), (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, completing all of the 21 required courses in the major as listed below, including the capstone course, the internship preparedness course, and an 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).

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 425</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 426</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 545</td>
<td>Introduction to Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>MATH 646</td>
<td>Linear Algebra for Applications</td>
<td></td>
</tr>
<tr>
<td>MATH 739</td>
<td>Applied Regression Analysis</td>
<td>4</td>
</tr>
<tr>
<td>COMP 424</td>
<td>Applied Computing 1: Foundations of Programming</td>
<td>4</td>
</tr>
<tr>
<td>COMP 415</td>
<td>Introduction to Computer Science I</td>
<td></td>
</tr>
<tr>
<td>COMP 430</td>
<td>Systems Fundamentals</td>
<td>4</td>
</tr>
<tr>
<td>COMP 520</td>
<td>Database Design and Development</td>
<td>4</td>
</tr>
<tr>
<td>IT 505</td>
<td>Integrative Programming</td>
<td>4</td>
</tr>
<tr>
<td>COMP 625</td>
<td>Data Structures Fundamentals</td>
<td>4</td>
</tr>
<tr>
<td>CS 416</td>
<td>Introduction to Computer Science II</td>
<td></td>
</tr>
<tr>
<td>COMP 570</td>
<td>Statistics in Computing and Engineering</td>
<td>4</td>
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<tr>
<td>MATH 539</td>
<td>Introduction to Statistical Analysis</td>
<td></td>
</tr>
<tr>
<td>MATH 644</td>
<td>Statistics for Engineers and Scientists</td>
<td></td>
</tr>
<tr>
<td>COMP 625</td>
<td>Data Structures and Algorithms</td>
<td>4</td>
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<tr>
<td>CS 515</td>
<td>Data Structures and Introduction to Algorithms</td>
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<tr>
<td>Business 1</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

1. In consultation with your advisor, select:
1 course (4 credits) in Introduction to Business
1 course (4 credits) in Organizational Behavior
1 course (4 credits) in Organizational Leadership

Degree Plan

Sample Course Sequence

First Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COMP 424 or CS 415</td>
<td>Applied Computing 1: Foundations of Programming or Introduction to Computer Science I</td>
</tr>
<tr>
<td>ENGL 401</td>
<td>First-Year Writing</td>
</tr>
<tr>
<td>MATH 425</td>
<td>Calculus I</td>
</tr>
<tr>
<td>Discovery Course</td>
<td>4</td>
</tr>
<tr>
<td>Credits</td>
<td>16</td>
</tr>
</tbody>
</table>

Spring

| BUS A 1 | 4 |
| COMP 525 or CS 416 | Data Structures Fundamentals or Introduction to Computer Science II | 4 |
| DATA 557 or CS 457 | Introduction to Data Science and Analytics or Introduction to Data Science and Analytics | 4 |
| MATH 426 | Calculus II | 4 |
| Credits | 16 |
## Second Year
### Fall
- **COMP 625** or **CS 515**: Data Structures and Algorithms or Data Structures and Introduction to Algorithms  
  4 credits
- **MATH 645**: Linear Algebra for Applications  
  4 credits
- Discovery Course  
  4 credits
- Elective  
  2 credits
- **Credits**: 16 credits

### Spring
- **COMP 430**: Systems Fundamentals  
  4 credits
- **COMP 520** or **IT 505**: Database Design and Development or Integrative Programming  
  4 credits
- **COMP 570** or **MATH 539** or **MATH 644**: Statistics in Computing and Engineering or Introduction to Statistical Analysis or Statistics for Engineers and Scientists  
  4 credits
- Discovery Course  
  4 credits
- **Credits**: 16 credits

## Third Year
### Fall
- **BUS B**:  
  4 credits
- **DATA 674**: Predictive and Prescriptive Analytics I  
  4 credits
- **MATH 739**: Applied Regression Analysis  
  4 credits
- Discovery Course  
  4 credits
- **Credits**: 16 credits

### Spring
- **DATA 675** or **COMP 721**: Predictive and Prescriptive Analytics II or Big Data for Data Engineers  
  4 credits
- **ENGL 502**: Professional and Technical Writing  
  4 credits
- **UMST 582**: Internship and Career Planning Seminar  
  1 credit
- Discovery Course  
  4 credits
- Discovery Course  
  4 credits
- **Credits**: 17 credits

## Fourth Year
### Fall
- **BUS C**:  
  4 credits
- **DATA #757**: Mining Massive Datasets  
  4 credits
- Discovery Course  
  4 credits
- Elective  
  4 credits
- **Credits**: 16 credits

### Spring
- **DATA #790** or **CS 791** or **CS 792**: Capstone Project or Senior Project I or Senior Project II  
  4 credits
- Discovery Course  
  4 credits
- Elective  
  4 credits
- Elective  
  4 credits
- **Credits**: 16 credits
- **Total Credits**: 129 credits

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1. In consultation with your advisor, select: Introduction to Business, Organizational Behavior, or Organizational Leadership.

2. MATH 531 Mathematical Proof strongly encouraged

### 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