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 such as the Master of Science in Analytics 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. 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. 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 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).

Program Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH 425</td>
<td>Calculus I</td>
<td>4</td>
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<tr>
<td>MATH 426</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
<td>MATH 545</td>
<td>Introduction to Linear Algebra</td>
<td>4</td>
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<tr>
<td>or MATH 646</td>
<td>Linear Algebra for Applications</td>
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<tr>
<td>MATH 739</td>
<td>Applied Regression Analysis</td>
<td>4</td>
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<tr>
<td>COMP 424</td>
<td>Applied Computing 1: Foundations of Programming</td>
<td>4</td>
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<tr>
<td>or CS 414</td>
<td>From Problems to Algorithms to Programs</td>
<td></td>
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<tr>
<td>or CS 415</td>
<td>Introduction to Computer Science I</td>
<td></td>
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<tr>
<td>COMP 643</td>
<td>Systems Fundamentals</td>
<td>4</td>
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<tr>
<td>COMP 520</td>
<td>Database Design and Development</td>
<td>4</td>
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<tr>
<td>or IT 505</td>
<td>Integrative Programming</td>
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<tr>
<td>COMP 525</td>
<td>Data Structures Fundamentals</td>
<td>4</td>
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<tr>
<td>or CS 416</td>
<td>Introduction to Computer Science II</td>
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<tr>
<td>or CS 417</td>
<td>From Programs to Computer Science</td>
<td></td>
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<tr>
<td>COMP 570</td>
<td>Statistics in Computing and Engineering</td>
<td>4</td>
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<tr>
<td>or MATH 539</td>
<td>Introduction to Statistical Analysis</td>
<td></td>
</tr>
<tr>
<td>or MATH 644</td>
<td>Statistics for Engineers and Scientists</td>
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<tr>
<td>COMP 625</td>
<td>Data Structures and Algorithms</td>
<td>4</td>
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<tr>
<td>or CS 515</td>
<td>Data Structures and Introduction to Algorithms</td>
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Degree Plan

Sample Course Sequence

Course                                                                                       Title                                               Credits
First Year                                                                                     
Fall                                                                                           
COMP 424 or CS 414                                                                          Applied Computing 1: Foundations of Programming     4
or CS 415                                                                                    or From Problems to Algorithms to Programs           
or CS 417                                                                                    or Introduction to Computer Science I               
ENGL 401                                                                                     First-Year Writing                                   4
MATH 425                                                                                     Calculus I                                          4
Spring                                                                                         
Credits                                                                                       16
BUS A 1                                                                                      
COMP 525 or CS 416                                                                          Data Structures Fundamentals                        4
or CS 417                                                                                    or Introduction to Computer Science II              
or CS 417                                                                                    or From Programs to Computer Science                 
DATA 557 or CS 457                                                                          Introduction to Data Science and Analytics           4
or Introduction to Data Science and Analytics                                                 
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
- **MATH 645**: Linear Algebra for Applications 4
- Discovery Course 4
- Elective 4

**Credits**: 16

#### Spring
- **COMP 430**: Systems Fundamentals 4
- **COMP 520** or **IT 505**: Database Design and Development or Integrative Programming 4
- **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
- Discovery Course 4

**Credits**: 16

### Third Year

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

**Credits**: 16

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

**Credits**: 17

### Fourth Year

#### Fall
- **BUS C**: 4
- **DATA 757**: Mining Massive Datasets 4
- Discovery Course 4
- Elective 4

**Credits**: 16

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

**Credits**: 16

**Total Credits**: 129

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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

- 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.