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 the theoretical mathematical and computational underpinnings of modern data science.

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 22 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).

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 528</td>
<td>Multidimensional Calculus</td>
<td>4</td>
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<tr>
<td>MATH 531</td>
<td>Mathematical Proof</td>
<td>4</td>
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<tr>
<td>MATH 539</td>
<td>Introduction to Statistical Analysis</td>
<td>4</td>
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<tr>
<td>or MATH 644</td>
<td>Statistics for Engineers and Scientists</td>
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<tr>
<td>MATH 645</td>
<td>Linear Algebra for Applications</td>
<td>4</td>
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<tr>
<td>MATH 738</td>
<td>Data Mining and Predictive Analytics</td>
<td>4</td>
</tr>
<tr>
<td>MATH 755</td>
<td>Probability with Applications</td>
<td>4</td>
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<tr>
<td>MATH 756</td>
<td>Principles of Statistical Inference</td>
<td>4</td>
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<tr>
<td>MATH 797</td>
<td>Senior Seminar ¹</td>
<td>4</td>
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<tr>
<td>or MATH 798</td>
<td>Senior Project</td>
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**Mathematics**

**Computer Science**

CS 414  From Problems to Algorithms to Programs  4
or CS 415  Introduction to Computer Science I  4
CS 417  From Programs to Computer Science  4
or CS 416  Introduction to Computer Science II  4
CS 659  Introduction to the Theory of Computation  4
CS 750  Machine Learning  4
CS 758  Algorithms  4
CS 775  Database Systems  4

**English**

ENGL 502  Professional and Technical Writing  4

**Analytics Course**

DATA 557  Introduction to Data Science and Analytics  4

Select three electives ²  12

Total Credits  84

¹ Fulfills capstone requirement
² Must be 600-700 level and approved by advisor

For additional information about the Analytics and Data Science: Data Science Option, contact Jeremiah Johnson, program coordinator, at (603) 641-4127 or jeremiah.johnson@unh.edu.

University of New Hampshire