GRAND VIEW UNIVERSITY

# Data Science

**Degree Awarded:** Bachelor of Arts
**Requirements for the Major:** 54-57 credits

The major in Data Science is designed to prepare students to utilize skills and practices of data science, preparing them for many careers, connecting to a wide variety of areas of study. The major emphasizes the statistical/probabilistic and algorithmic methods that underlie the acquisition, preparation, analysis, and communication of complex data. With its focus on technical foundations, within a liberal arts context, the data science program also promotes skills useful for creating and implementing new or special-purpose analysis and visualization tools. Students will be able to contribute to the application of and growth of data science in ethical ways.

Students will learn to think critically about the process of understanding data and will develop an in-depth understanding of the key technologies in data science and analytics: data mining, machine learning, visualization techniques, predictive modeling, and statistics. The major also promotes a fundamental understanding of how to best handle uncertainty when making data-driven decisions.

A capstone and internship experience will put the skills and knowledge learned into action.

**Prerequisite courses for the major:** Placement in MATH 231, Calculus with Analytic Geometry I, 5 credits.

**Required courses for the major:**

| | | | | Essential Competencies-Outcome Iterations **Transfer courses do not receive outcome iterations** | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | IL | W | O | Q | GA | V |
| | DATA 101 | Introduction to Data Analytics | 3 | x | | | | | x |
| | DATA 321 | Data Visualization | 3 | | x | | | | |
| | MATH 231 | Calculus with Analytic Geometry I | 5 | | | | x | | |
| | MATH 232 | Calculus with Analytic Geometry II | 5 | | | | | | |
| | MATH 331 | Linear Algebra | 3 | | | | | | |
| | STAT 261 | Applied Statistics | 3 | | | | x | x | |
| | STAT 341 | Applied Regression Analysis and Modeling | 3 | | | x | | | |
| | CPSC 241 | Computer Science I | 3 | | | | | | |
| | CPSC 242 | Computer Science II | 3 | x | | | | | |
| | CPSC 260 | Programming for Data Wrangling and Data Mining | 3 | | | | | | |
| | CPSC 310 | High Performance Computing for Big Data and AI | 3 | | | | | | |
| | CPSC 421 | Databases | 3 | | x | x | | | |
| | CPSC 441 | Machine Learning | 3 | | | | | | |
| | CPSC 399 | Internship | 1-3 | | | | | | x |
| | CPSC 449 | Ethics Seminar | 1 | | | | | | |
| | CPSC 453 or<br>MATH 450 | Senior Capstone Seminar or<br>Senior Seminar | 3 or<br>3 | x<br>x | x<br>x | x<br>x | <br>x | | <br>x |

**Take two courses from the following:**

| | | | | IL | W | O | Q | GA | V |
|---|---|---|---|---|---|---|---|---|---|
| | STAT 361 | Introduction to Probability Theory | 4 | | | | | | |
| | STAT 430 | Topics in Statistics | 3 | | | | | | |
| | STAT 441 | Design and Analysis of Experiments | 3 | | | | | | |
| | STAT 461 | Spatiotemporal Data Analysis | 3 | | | | | | |
| | STAT 465 | Bayesian Analysis | 3 | | | | | | |

All courses in the above categories will be counted in computing the 2.2 GPA required for this major.