Morris Campus

Data Science Minor

Division of Science & Mathematics - Adm

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- Program Type: Undergraduate free-standing minor
- Requirements for this program are current for Spring 2023
- Required credits in this minor: 26 to 32
- N/A

Data science is one of the fastest growing segments in the modern economy. It is inherently multidisciplinary and offers high job satisfaction. The Division of Science and Math is dedicated to "quality undergraduate instruction in the natural and mathematical sciences so that its graduates are well prepared to seek employment at the B.A. level, to enter graduate or professional school, or to teach at the secondary school level."

UMM is also dedicated to "preparing its students to be global citizens who value and pursue intellectual growth, civic engagement, intercultural competence, and environmental stewardship." Being an informed global citizen and making informed decisions about public policy (civic engagement) and environmental issues (stewardship) is enhanced by the ability to understand, interpret, and analyze data-- all skills developed by the minor. Jobs not directly data-related are increasingly data-driven and the more data-savvy a student, the more prepared they will be to pursue their aspirations.

Although the majority of courses in the minor are Stats and CSci, data science has its own techniques, concerns, and professional communities. A data science minor will aid students interested in pursuing a career in data science or one that entails working with data scientists. A strong industry drive for practitioners to develop 'non-technical coursework' strongly aligns with the values of a liberal arts education and provides students the opportunity to leverage non-technical interests and coursework to increase their attractiveness to potential employers and graduate programs.

Objectives:
Familiarize students with the techniques and foundational material necessary for students to pursue future studies or careers in data science.
Ensure that students understand the ethical implications inherent in the data science field.
Develop the knowledge, skills, and experiences necessary to properly deal with data (data acumen).
Ensure that students can properly communicate data science ideas and results to both broad and specialized audiences.

Learning Outcomes:
Students will gain the ability to apply knowledge of data science to other disciplines
Students will develop their data acumen.
Students will be able to demonstrate an understanding of the ethical implications inherent in the data science discipline.
Students will be able to communicate data science ideas and results to both broad and specialized audiences effectively using presentation skills and visualizations.

Program Delivery

This program is available:
- via classroom (the majority of instruction is face-to-face)

Minor Requirements

Courses may not be taken S-N unless offered S-N only.

A minimum GPA of 2.00 is required in the minor to graduate. The GPA includes all, and only, University of Minnesota coursework. Grades of "F" are included in GPA calculation until they are replaced.

Statistical Literacy
STAT 1601 - Introduction to Statistics [M/SR] (4.0 cr)
or STAT 2601 - Statistical Methods [M/SR] (4.0 cr)

Computational Literacy
CSCI 1201 *{Inactive}*[M/SR] (4.0 cr)
or CSCI 1251 - Computational Data Management and Manipulation [M/SR] (4.0 cr)
or CSCI 1301 - Problem Solving and Algorithm Development [M/SR] (4.0 cr)

Ethics
 IS 1091W - Ethical and Social Implications of Technology [E/CR] (2.0 cr)

Core
 Introduction to Data Science
   CSCI 2701 - Introduction to Data Science [M/SR] (4.0 cr)
   or STAT 2701 - Introduction to Data Science [M/SR] (4.0 cr)
 Intermediate Data Science
   CSCI 3701 - Intermediate Data Science (4.0 cr)
   or STAT 3701 - Intermediate Data Science (4.0 cr)

Electives
 At least one course from the list below or discipline approved course.
 Take 1 or more course(s) from the following:
 •STAT 3501 - Survey Sampling [M/SR] (4.0 cr)
 •STAT 4601 - Biostatistics (4.0 cr)
 •STAT 4631 - Design and Analysis of Experiments (4.0 cr)
 •STAT 4651 - Applied Nonparametric Statistics (4.0 cr)
 •STAT 4671 - Statistical Computing (4.0 cr)
 •STAT 4681 - Introduction to Time Series Analysis (4.0 cr)

Program Sub-plans
Students are required to complete one of the following sub-plans.

Computer Science
Data Structure, Algorithms and Complexity
 CSCI 2101 - Data Structures [M/SR] (5.0 cr)
 CSCI 3501 - Algorithms and Computability (5.0 cr)

Statistics
Multivariate Statistics
 STAT 3611 - Multivariate Statistical Analysis [M/SR] (4.0 cr)