Data Science, B.S. *major*

****NOTE: This program is pending final MinnState approval****

Data science is an interdisciplinary field of scientific methods, processes, algorithms and systems that use data to draw conclusions and make predictions. The data science major provides a strong foundation in statistics and computer science, along with courses in applied areas of study. Students will learn the statistical, computational, and programing tools necessary to prepare them for employment in many applied fields that rely on data. In addition to the overall graduation requirements, the B.S. Data Science major requires each student complete 59 credits in the major with an overall minimum GPA of 2.25. All prerequisite and required courses must be completed with grades of C- or above. This major offers courses in statistics, mathematics, computer science and applied areas.

A total of 120 semester credits are needed for the **Data Science** B.S. degree and include the following:

- 40 upper division credits (level 3000/4000)
- 55 required major core credits
- Completion of Core Curriculum credits (Minnesota Transfer Curriculum [MnTC] Goal Areas 1-10) - required for all baccalaureate degrees
- Completion of BSU Focus and Nisidotaading Course Requirements

Required Credits: 55
Required GPA: 2.25

I REQUIRED MATH COURSES

Complete the following courses:

- MATH 2471 Calculus I (5 credits)
- MATH 2472 Calculus II (5 credits)
- MATH 3310 Linear Algebra (4 credits)

II REQUIRED STATISTICS COURSES

Complete the following courses:

- STAT 2610 Applied Statistics (4 credits)
- STAT 3610 Time Series Analysis (3 credits)
- STAT 3620 Applied Regression Analysis (3 credits)
- STAT 3631 Probability and Statistics I (4 credits)
- STAT 4000 Capstone in Statistics (3 credits)

III REQUIRED COMPUTER SCIENCE COURSES

Complete the following courses:

- CS 2321 Computer Science I (4 credits)
- CS 2322 Computer Science II (4 credits)
- CS 2750 Introduction to Data Analysis (3 credits)
- CS 3507 Introduction to Databases (3 credits)
- CS 3528 Data Structures and Algorithms (4 credits)
- CS 3752 Data Mining (3 credits)

IV OTHER REQUIRED COURSES

Select two of the following courses:

- TADT 3880 Quality Assurance (3 credits)
- TADT 4899 Design of Experiments (3 credits)
- BUAD 3232 Predictive Analytics (3 credits)
- BUAD 4385 Data Modeling and Visualization (3 credits)
- ENVR 3800 Sustainability Analytics & Modeling (3 credits)
- GEOG 3231 Introduction to Geographic Information Systems (3 credits)
- GEOG 4150 Applications of Machine Learning (3 credits)
- GEOG 4265 Spatial Analysis (3 credits)
- SOC 3001 Quantitative Research Methods in the Social Sciences (3 credits)

Program Learning Outcomes | Data Science, B.S.

1. Knowledge: Students will understand the content and methods of the core areas of undergraduate statistics.

2. Analysis: Students will use data and data visualization to identify, interpret and analyze problems, find patterns in data and make conjectures.

3. Application: Students will apply appropriate statistics and computer science procedures and technology to solve problems.

4. Articulate how biases, both unintended and intended, in data collection techniques, mining algorithms, and analyses can skew the information derived from the data and the effect this can have on diverse groups

5. Communication: Students will communicate results effectively and accurately, both verbally, in writing, and through data visualization.

6. Career Readiness: Students will be prepared for a variety of careers in industry and further study in data science.

Suggested Semester Schedule | Data Science, B.S.

The following is a list of required Data Science Major, B.S. courses by year. This schedule is intended to help students plan their courses in an orderly fashion; however, these are only suggestions and this schedule is flexible.

Freshman

- MATH 1470 Precalculus (3 credits) (if needed)
- MATH 2471 Calculus I (5 credits)
- STAT 2610 Applied Statistics (4 credits)
- CS 2321 Computer Science I (4 credits)
- CS 2322 Computer Science II (4 credits)
- Core Curriculum requirements

Sophomore

- MATH 2472 Calculus II (5 credits)
- MATH 3310 Linear Algebra (4 credits)
- STAT 3610 Time Series Analysis (3 credits)
  or STAT 3620 Applied Regression Analysis (3 credits)
  or STAT 3631 Probability and Statistics I (4 credits)
- CS 2750 Introduction to Data Analysis (3 credits)
- Courses in the Field of Emphasis (consult with advisor)
- Core Curriculum requirements

Junior/Senior

- STAT 3610 Time Series Analysis (3 credits)
  or STAT 3620 Applied Regression Analysis (3 credits)
  or STAT 3631 Probability and Statistics I (4 credits)
- CS 3507 Introduction to Databases (3 credits)
- CS 3528 Data Structures and Algorithms (4 credits)
- CS 3752 Data Mining (3 credits)

- Courses in the Field of Emphasis (consult with advisor)
- STAT 4000 Capstone in Statistics (3 credits)
- Complete Core Curriculum requirements