

COMPONENTS

These eight components show some of the benefits data science education can have on the local businesses, organizations, and institutions.

Data Visualization

Transforming raw data into something that clients can understand and that tells a story is a major challenge in the business world. The foundation of our program is data visualization while incorporating real-world applications.

Scientific Methods

Scientific methods are used to analyze and reduce complex data into simpler forms.

Statistical Modeling

Many business problems can be modeled using advanced statistical methods. We have several faculty members with strong backgrounds in statistics, both pure and applied.

Statistical Computing

Students and faculty alike use powerful statistical software to perform the tedious computations required in data analysis.

Real-world data applications

Our students work on real-world data problems provided to us by local industries.

Data Consulting

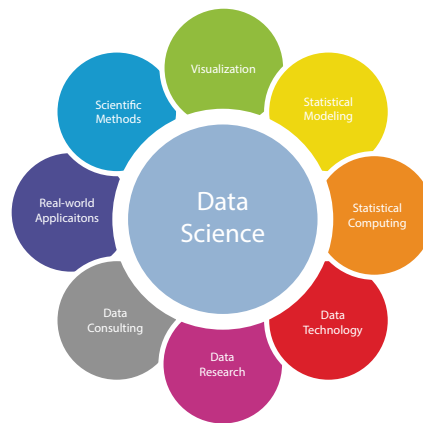
Our department will provide free consulting on data-related problems to the local community. This has the potential of creating major data science projects for our students, providing valuable real-world experience.

Data Research

Our department has several researchers in statistics and operations research. We plan to develop research problems in data science in collaboration with the local community. This strengthens the academic research program and lays the foundations for a possible future doctorate in data science.

Data Technology

The department has access to big data technology, as well as sophisticated data science software. We plan to expand the technology with a data science lab housed in our department and supported by the local business community.



UNIVERSITY OF
Nebraska
Omaha

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF MATHEMATICS

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 | COLLEGE OF ARTS AND SCIENCES

DATA SCIENCE



UNIVERSITY OF
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WHAT IS DATA SCIENCE?



Raw Data

Data collected from a source that has not been processed and translated. Examples may include inventory numbers, financial figures, or customer information.

Data Science

Data science is the art and science of transforming raw data into deliverable data products. Skills utilized may be visualization, statistical modeling, data research, or scientific methods.

Data Product

Once processed, the data may provide clients with pertinent information to make educated business decisions. Clients may include banks, retail stores, utility companies, etc.

Data Science Education

The mission the Department of Mathematics in the College of Arts and Sciences for data science is to provide a high-quality multidisciplinary educational program to train future data professionals, as well as applying our data science model with local business community partners. The Department of Mathematics is now offering concentrations in data science both at the graduate and undergraduate levels.

DEPARTMENT OF MATHEMATICS

BS in Mathematics with Data Science Concentration

This concentration is recommended for undergraduate students interested in a career as a data science professional or to those wishing to pursue graduate study in disciplines with a strong data analysis component. In addition to the traditional required lower-level mathematics courses, the following upper-level courses constitute the data science concentration:

Core Data Science Courses

- STAT 4410 Introduction to Data Science
- STAT 4420 Exploratory Data Visualization and Quantification
- MATH 4740 Introduction to Probability and Statistics I
- MATH 4750 Introduction to Probability and Statistics II

Additional Electives

- STAT 4430 Applied Linear Models
- STAT 4440 Time Series Analysis
- MATH 4300 Deterministic Operations Research Models
- MATH 4310 Probabilistic Operations research Models

Cognate Area

All students are required to take at least 15 credit hours outside of mathematics in a secondary area of emphasis (cognate area) in order to satisfy the multidisciplinary requirement of the degree program.

The requirements are:

One approved statistics course from outside the department, along with one of the following three options:

1. Minor in Business Administration, or
2. Minor in Management Information Systems, or
3. 15 hours of an approved cognate area outside the department

MS in Mathematics with Data Science Concentration (36 hours)

This concentration is recommended for graduate students interested in a career as a data science professional.

Core Courses (9 hours)

- STAT 8416 Intro to Data Science
- STAT 8426 Exploratory Data Visualization and Quantification
- MATH 8306 Deterministic Operations Research

Additional Electives (3-9 hours)

- MATH 8316 Probabilistic Operations Research
- MATH 8430 Linear Programming
- MATH 8440 Network Programming
- MATH 8460 Integer Programming
- MATH 8970 Independent study
- STAT 8436 Linear Models
- STAT 8446 Time Series
- MATH 8650 Introduction to Probability Models

Courses from the College of Business Administration (CBA) and/or the College of Information Science & Technology (IS&T) (12 hours)

Approved electives from CBA/IS&T, such as:

- ISQA 8700 Data Warehousing
- ECON 8300 Econometrics

Project (6 hours)

- MATH/STAT 8960 Project in Partnership with Local Business Community