

# DATA SCIENCE, MS

The Master of Science in Data Science program requires the successful completion of 12 courses to obtain a degree. These requirements cover six core courses, a leadership or project management course, two required courses corresponding to a declared specialization, two electives, and a capstone project or thesis. A specialization may be declared as part of the application process or may be declared at any time during a student's tenure in the program. Students also have the option of choosing a general data science curriculum with no declared specialization. There are four specializations: Analytics and Modeling (<https://catalogs.northwestern.edu/sps/graduate/data-science/data-science-ms-analytics-modeling-specialization/>), Analytics Management (<https://catalogs.northwestern.edu/sps/graduate/data-science/data-science-ms-analytics-management-specialization/>), Artificial Intelligence (<https://catalogs.northwestern.edu/sps/graduate/data-science/data-science-ms-artificial-intelligence-specialization/>), and Data Engineering (<https://catalogs.northwestern.edu/sps/graduate/data-science/data-science-ms-data-engineering-specialization/>).

## Curriculum

### Core Courses (8 units)

Course	Title
MSDS 400-DL	Math For Data Scientists
MSDS 401-DL	Applied Statistics with R
MSDS 402-DL or MSDS 403-DL	Introduction to Data Science <sup>1</sup> Data Science in Practice
MSDS 420-DL	Database Systems and Data Preparation
MSDS 422-DL	Practical Machine Learning
MSDS 460-DL	Decision Analytics
MSDS 475-DL or MSDS 480-DL or MSDS 485-DL	Project Management Business Leadership and Communications Data Governance, Ethics, and Law
MSDS 498-DL or MSDS 590-DL	Capstone Class Thesis Research

#### <sup>1</sup> Which course should students take?

- Students without a background in data science should select MSDS 402-DL Introduction to Data Science.
- Students with a background in data science should select MSDS 403-DL Data Science in Practice. Students who have at least two years' experience in the field and have or had a title, such as data scientist, data analyst, statistician, data engineer, business analyst, etc. should select this course.

### Electives (4 units)

Course	Title
MSDS 410-DL	Supervised Learning Methods
MSDS 411-DL	Unsupervised Learning Methods
MSDS 413-DL	Times Series Analysis and Forecasting
MSDS 430-DL	Python for Data Analysis
MSDS 432-DL	Foundations for Data Engineering
MSDS 434-DL	Analytics Application Engineering
MSDS 436-DL	Analytics Systems Engineering
MSDS 440-DL	Real-Time Interactive Processing and Analytics
MSDS 442-DL	Real-Time Stream Processing and Analytics
MSDS 450-DL	Marketing Analytics
MSDS 451-DL	Financial and Risk Analytics

MSDS 452-DL	Web and Network Data Science
MSDS 453-DL	Natural Language Processing
MSDS 454-DL	Advanced Modeling Techniques
MSDS 455-DL	Data Visualization
MSDS 456-DL	Sports Performance Analytics
MSDS 457-DL	Sports Management Analytics
MSDS 458-DL	Artificial Intelligence and Deep Learning
MSDS 459-DL	Knowledge Engineering
MSDS 462-DL	Computer Vision
MSDS 464-DL	Intelligent Systems and Robotics
MSDS 470-DL	Analytics Entrepreneurship
MSDS 472-DL	Analytics Consulting
MSDS 474-DL	Accounting and Finance for Analytics Managers
MSDS 485-DL	Data Governance, Ethics, and Law
MSDS 490-DL	Special Topics in Data Science
MSDS 499-DL	Independent Study

## About the Final Project

As their final course in the program, students take either a master's thesis project in an independent study format or a classroom final project class in which students integrate the knowledge they have gained in the core curriculum in a team project approved by the instructor. In both cases, students are guided by faculty in exploring the body of knowledge of data science. The master's thesis or capstone class project count as one unit of credit.

Course	Title
<b>Choose one</b>	
MSDS 498-DL	Capstone Class
MSDS 590-DL	Thesis Research