

# DATA SCIENCE (DS)

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## DS-107 INTRO TO DATA & DATA ANALYTICS (3 Credits)

This introduction begins with many of the topics of traditional statistics used in Data Science including data collection, cleaning, visual display, summary statistics and their distributions. It continues with methods for data exploration, introduces multivariate data, including covariance, the selection of predictor variables and reduction of dimension. It concludes with a brief introduction to information theory especially as related to variable selection and the close cousins, data comprehension and knowledge discovery.

## DS-201 DATA SCIENCE TOOLKIT (3 Credits)

An introduction to traditional methods of Data Science with an emphasis on the relevant mathematics, statistics and theory. Topics to include regression, clustering, discriminant analysis, naive Bayes, variable selection, decision trees, and time series.

**Prerequisite(s):** TAKE CS-133 CSL-133

**Corequisite(s):** TAKE DSL-201

## DS-301 EMERGING TRENDS IN DATA SCIENCE (3 Credits)

An introduction to the established Data Science tool kit including clustering, the many faces of regression, random forests, and support vector machines. An optional introduction to neural nets and deep learning. An introduction to the presentation of Data Science results including proper visualization and storytelling. The course consists of three lecture hours and one two-hour laboratory per week.

**Prerequisite(s):** TAKE DS-201 DSL-201

**Corequisite(s):** TAKE DSL-301

## DS-351 DATA SCIENCE CASE STUDIES (3 Credits)

This course explores the challenges and opportunities in the evolving field of Data Science by evaluating case studies across the entire data science pipeline. Classes are interspersed with student presentations and discussions around best practices, technical implementation, and ethical concerns. Based on the reviewed case studies, students will analyze the future of Data Science and their role within the field.

## DS-401 SENIOR COMPREHENSIVE PROJECT I (2 Credits)

As part of the senior capstone, students will formulate and carry out a Data Science project within or across one or more areas of their major. In this first capstone course, students will learn how to choose a topic, conduct a literature review, and choose appropriate methods.

**Prerequisite(s):** TAKE DS-301 DS-351

## DS-402 SENIOR COMPREHENSIVE PROJECT II (1 Credit)

As part of the senior capstone, students will build on their work from the first capstone course to formulate and report on their results. In this course, students will synthesize findings, write a paper, and give a presentation to the department.

**Prerequisite(s):** TAKE DS-401

## DSL-201 DATA SCIENCE TOOLKIT LAB (1 Credit)

An introduction to traditional methods of Data Science with an emphasis on the relevant mathematics, statistics and theory. Topics to include regression, clustering, discriminant analysis, naive Bayes, variable selection, decision trees, and time series.

**Prerequisite(s):** TAKE CS-133 CSL-133

**Corequisite(s):** TAKE DS-201

## DSL-301 EMERGING TRENDS IN DATA SCIENCE LAB (1 Credit)

An introduction to the established Data Science tool kit including clustering, the many faces of regression, random forests, and support vector machines. An optional introduction to neural nets and deep learning. An introduction to the presentation of Data Science results including proper visualization and storytelling. The course consists of three lecture hours and one two-hour laboratory per week.

**Prerequisite(s):** TAKE DS-201 DSL-201

**Corequisite(s):** TAKE DS-301