WISCONSIN ONLINE COLLABORATIVES

Fall 2025

Course Preview Week: August 26 - September 01, 2025
Semester Dates: September 02 - December 12, 2025

DS 701: Exploratory Data Analysis — 3 Credits

This course introduces data science and highlights its importance in decision making. Students will learn how to analyze data using the R programming language. During the course, students will learn how to import data into R, tidy it, conduct exploratory data analysis, develop visualizations, and draw statistical inferences. The course aims to teach data wrangling, visualization and exploration with R.
DS701 Course Syllabus

DS 705: Statistical Methods — 3 Credits

This course will present statistical methods and inference procedures with an emphasis on applications, computer implementation, and interpretation of results. Familiarity with the R programming language is highly recommended. Topics include simple and multiple regression, model selection, correlation, moderation/interaction analysis, logistic regression, the chi-square test, the Kruskal-Wallis test, analysis of variance (ANOVA), multivariate analysis of variance (MANOVA), factor analysis, and canonical correlation analysis.
Prerequisite: DS 700 or 701.
DS 705 Course Syllabus

DS 710: Programming for Data Science — 3 Credits

Computer programming is an essential part of data science. When working with large data sets, it's especially important to be able to write effective, efficient code to help you organize and understand the data. In this course, we'll introduce you to one of the most widely-used programming languages for data science: Python. You'll gain experience working with real-world data, and leave the course with skills you can apply in other courses in the MS Data Science Program as well as on the job!
DS 710 Syllabus

DS 716: Data Management for Data Science — 3 Credits

This course explores the various approaches for data management used in data science. We present how data is collected, transformed, stored, and delivered for use in data science projects.

DS 730: Big Data: High-Performance Computing — 3 Credits

This course prepares you to process large data sets efficiently. You will be introduced to nonrelational databases and algorithms that allow for the distributed processing of large data sets across clusters.
Prerequisite: DS 710
DS 730 Syllabus

DS 740: Data Mining & Machine Learning **3 Credits**

Explore data mining methods and procedures for diagnostic and predictive analytics. Topics include association rules, clustering algorithms, tools for classification, and ensemble methods. Computer implementation and applications will be emphasized.
Prerequisites: DS 705 and DS 710.
DS 740 Syllabus

DS 750: Data Storytelling **3 Credits**

Data storytelling involves using data to tell a compelling narrative that helps audiences understand, engage with, and act on the information. This course combines data analysis with communication techniques to present data in an informative and engaging way. This course is specifically designed as a graduate-level requirement for the MSDS degree, focusing on teaching students how to effectively communicate insights through data storytelling techniques. Participants will learn to craft engaging stories that resonate with various audiences and drive decision-making.
Prerequisites: DS 700 or 701. DS 705 OR DS 740 suggested but not required.
DS750 Course Syllabus

DS 770: Ethical Decision-Making Using Data **3 Credits**

This course examines how data science relates to developing strategies for organizations. The emphasis is on using an organization's data assets to inform better decisions. The course investigates the use of data science findings to develop solutions to competitive organizational challenges. Special attention is given to critically examining decisions to ensure that they are ethical and avoid unfair bias. Professional codes of conduct as well as local and international regulations are also considered.
Prerequisites: DS 740 suggested but not required.
DS770 Course Syllabus

DS 776: Deep Learning **3 Credits**

Introduction to the theory and applications of deep learning. The course begins with the study of neural networks and how to train them. Various deep learning architectures are introduced including convolutional neural networks, recurrent neural networks, and transformers. Applications may include image classification, object detection, and natural language processing. Algorithms will be implemented in Python using a high-level framework such as Pytorch or TensorFlow.
Prerequisites: DS 740.

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DS 785: Capstone

3 Credits

Students will develop and execute a data science project using real-world data and communicate results to non-technical audiences.
Prerequisites: DS715 or DS716, DS730, DS740, DS750 *or completion of 27 credits.*
Sample Capstone Projects
DS 785 Syllabus