DATA SCIENCE (DS)

DS 700 Foundations of Data Science   3.00
This course provides an introduction to data science and highlights its importance in business decision making. It provides an overview of commonly used data science tools along with spreadsheets, databases, statistics and programming assignments to lay the foundation for data science applications.
Prerequisites:
Admission to M.S. in Data Science program

Typically Offered:
  • Fall and Spring Terms

DS 705 Statistical Methods   3.00
Statistical methods and inference procedures will be presented in this course with an emphasis on applications, computer implementation, and interpretation of results. Topics include simple and multiple regression, model selection, correlation, moderation/interaction analysis, logistic regression, chi-square test, ANOVA, Kruskal-Wallis test, MANOVA, factor analysis, and canonical correlation analysis.
Prerequisites:
Successful completion of DS 700 and Admissions to M.S. in Data Science program

Typically Offered:
  • Fall and Spring Terms

DS 710 Programming for Data Science   3.00
Introduction to programming languages and packages used in Data Science.
Prerequisites:
Admission to M.S. in Data Science program

Typically Offered:
  • Fall and Spring Terms

DS 715 Data Warehousing   3.00
Introduce the concepts and techniques to work with and reason about subject-oriented, integrated, time-variant, and nonvolatile collections of data in support of management's decision-making process.
Prerequisites:
Admission to M.S. in Data Science program

Typically Offered:
  • Fall and Spring Terms

DS 730 Big Data: High Performance Computing   3.00
This course will teach students how to process large datasets efficiently. Students will be introduced to non-relational databases. Students will learn algorithms that allow for the distributed processing of large data sets across clusters.
Prerequisites:
Successful completion of DS 710 and declared Data Science Major

Typically Offered:
  • Fall and Spring Terms

DS 735 Communicating about Data   3.00
This course will prepare you to master technical, informational and persuasive communication to meet organizational goals. Technical communication topics include a study of the nature, structure and interpretation of data. Informational communication topics include data visualization and design of data for understanding and action. Persuasive communication topics include the study of written, verbal and nonverbal approaches to influencing decision makers.
Prerequisites:
Admission to M.S. in Data Science program

DS 740 Data Mining & Machine Learning   3.00
This course covers two aspects of data analytics. First, it teaches techniques to generate visualizations appropriate to the audience type, task, and data. Second, it teaches methods and techniques for analyzing unstructured data - including text mining, web text mining and social network analysis.
Prerequisites:
Successful completion of DS 700 & DS 710 and Admissions to M.S. in Data Science program

Typically Offered:
  • Fall and Spring Terms

DS 745 Visualization and Unstructured Data Analysis   3.00
This course covers two aspects of data analytics. First, it teaches techniques to generate visualizations appropriate to the audience type, task, and data. Second, it teaches methods and techniques for analyzing unstructured data - including text mining, web text mining and social network analysis.
Prerequisites:
Successful completion of DS 740 and Admission to the M.S. Data Science program

Typically Offered:
  • Fall and Spring Terms

DS 760 Ethics of Data Science   3.00
This course will focus on the investigation of ethical issues in computer science that ultimately also pertain to data science, including privacy, plagiarism, intellectual property rights, piracy, security, confidentiality and many other issues. Our study of these issues will begin broadly, with a look at ethical issues in computer science at large. We will then make inferences to the narrower field of data science. We will consider ethical arguments and positions, the quality and integrity of decisions and inferences based on data and how important cases and laws have shaped the legality, if not the morality, of data science related computing. Case studies will be used to investigate issues.
Prerequisites:
Successful completion of DS 740 and Admission to the M.S. Data Science program

Typically Offered:
  • Fall and Spring Terms

DS 775 Prescriptive Analytics   3.00
This course covers procedures and techniques for using data to inform the decision-making process. Topics include optimization, decision analysis, game theory, and simulation. Case studies and applications will be emphasized.
Prerequisites:
Successful completion of DS 705 and DS 710 and Declared DS Major

Typically Offered:
  • Fall and Spring Terms

DS 776 Deep Learning   3.00
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:
Prerequisite for enrollment in DS 776 is successful completion of DS 740

Typically Offered:
  • Online: Fall & Spring

DS 780 Data Science and Strategic Decision Making   3.00
The interaction between data science and strategic decision making. Leveraging data resources for competitive advantage in the marketplace.
Prerequisites:
Admission to M.S. in Data Science program

Typically Offered:
  • Fall and Spring Terms

DS 785 Data Science Capstone   3.00
Capstone course; students will develop and execute a data science project using real-world data and communicate results to a non-technical audience.
Prerequisites:
Successful completion of Data Science 700, 705, 710, 715, 730, 735, 740, 745 & 775

Typically Offered:
  • Fall and Spring Terms