

DATA SCIENCE (DTS)

DTS 2201 Programming in Data Science (3 Credits)

Introduction to the field of data science and the programming language of R. Explores the data science lifecycle, including question formulation, data collection and cleaning, exploratory data analysis and visualization, statistical inference and prediction, and decision-making. Focuses on quantitative critical thinking and key principles and techniques needed to carry out this cycle. No prior programming experience required.

Prerequisites: MATH 1200

Previous: Legacy Equivalent(s): DTS* 201

DTS 2203 Elements of Data Science (4 Credits)

This course introduces the basic concepts of data science as they apply to several disciplines. Students will explore methods to collect, organize, manage, examine, prepare, analyze and visualize combined data sources. Emphasis will be placed on the development of sound research questions, the identification and verification of data sources, the recognition of random behavior, the retrieval, cleaning and manipulation of data and the process for identifying the data elements that are relevant for a given audience. The ethics of data production and use will also be discussed.

Prerequisites: MATH 1200 OR MATH 1201

Previous: Legacy Equivalent(s): DTS* 203

DTS 2205 Introduction to Artificial Intelligence (3 Credits)

This course provides an introduction to artificial intelligence (AI), the history and evolution of AI, and AI technology, and AI applications. Topics explore concepts in data analysis, machine learning and deep learning. Students examine the use of AI in society and ethical issues related to AI, and build AI models to solve problems in the domains of statistical data, natural language processing, and machine learning.

Corequisite: MATH 1200

DTS 2215 Data Ethics and Security (3 Credits)

This course introduces critical and ethical issues surrounding data and society. A blend of social and historical perspectives on data ethics, policy, security, and case examples will be explored. There is a strong focus on the core principles related to proper management, use, and understanding of data. Current issues related to data ethics and security are addressed and explored.

Prerequisites: Eligibility for ENG 0910

Previous: Legacy Equivalent(s): DTS* 215

DTS 2220 Introduction to Machine Learning (3 Credits)

This course focuses on machine learning as an integral tool for data science, including how to use data to automatically understand the world, make complex decisions, and even predict the future. Several algorithms will be introduced along with which language (Python or R) is better suited for which algorithm based on the particular goal in mind. Programming language(s) will be used.

Prerequisites: DTS 2201 OR DTS 2203

Previous: Legacy Equivalent(s): DTS* 220

DTS 2230 Natural Language Processing (3 Credits)

Students learn fundamental concepts in Natural Language Processing (NLP) and text processing. The course focuses on developing knowledge and skills necessary to create and apply language recognition applications. Students learn to build chatbots that employ machine learning algorithms and neural networks.

Prerequisites: DTS 2220

DTS 2240 Artificial Intelligence for Computer Vision (3 Credits)

Students examine and apply basic techniques in computer vision. The course focuses on machine learning models in computer vision using OpenCV and python libraries. Students develop applications and learn to implement computer vision within an artificial intelligence project cycle.

Prerequisites: DTS 2220

DTS 2258 Data Journalism (3 Credits)

This course combines the world of data with the art of journalism. Taking students through the entire process of gathering, cleaning, organizing, visualizing, and reading the data with the intention to discover stories that lie within. Students will create a narrative from start to finish, accompanying their story with visuals created from the data. Tableau and online tools will be used.

Prerequisites: ENG 1010, MATH 1200

Prerequisite or corequisite: MATH 1200

Previous: Legacy Equivalent(s): DTS* 258

DTS 2290 Capstone Research (3 Credits)

PIC Math (Preparation for Industrial Careers in Mathematics) is a program sponsored by the Mathematical Association of America (MAA), the Society for Industrial and Applied Mathematics (SIAM), and the National Science Foundation (NSF). The goal of this capstone project is to provide students with experience in researching and solving industrial problems. Students work in groups and research problems given by local businesses, industry, and government (BIG). This course mimics an internship - students learn to interact in a business setting, manage deadlines, produce technical documents, and think critically to find solutions. By the end of the course, each group produces a solution to their problem and completes a written, oral (video), and poster/PowerPoint summary of their work.

Prerequisites: Permission by instructor

Previous: Legacy Equivalent(s): DTS* 299