

Data Science (DSCI)

DSCI 150 Data Science I: Introduction 3 Credits (3,0)

Setting up and maintaining a computing environment; data formatting, loading, and manipulation; elementary data analysis; historical and ethical contexts of modern practice.

Course Offered at: Prescott

DSCI 151 Data Science II: Foundations 3 Credits (3,0)

Basic programming; data analysis and visualization using software packages; foundational practices in data science.

Course Offered at: Prescott

DSCI 176 Ethics of Data Science 3 Credits (3,0)

Ethical considerations in data science. Recent and current ethical controversies; potential harm in data collection and analysis; case studies.

Course Offered at: Prescott

DSCI 199 Special Topics in Data Science 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in data science.

Course Offered at: Daytona Beach, Prescott

DSCI 201 Introduction to Data Science Applications 3 Credits (3,0)

Fundamental machine learning data analysis concepts and procedures.

Prerequisites: MATH 111 or higher and CPSC 251

Course Offered at: Worldwide

DSCI 244 Data Acquisition and Manipulation 3 Credits (3,0)

Data acquisition and storage; public data sources; application programming interfaces; web scraping; HTML parsing; regular expressions; SQL and NoSQL databases.

Course Offered at: Prescott

DSCI 299 Special Topics in Data Science 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in data science.

Course Offered at: Daytona Beach, Prescott, Worldwide

DSCI 310 Data Storytelling 3 Credits (3,0)

Tools, topics, and best practices in data visualization. Ethical data handling; exploratory and explanatory visualizations for data storytelling.

Prerequisites: STAT 211 or STAT 222

Course Offered at: Worldwide

DSCI 312 Machine Learning 3 Credits (3,0)

Machine learning algorithms; data collection, preparation, and preprocessing; supervised and unsupervised models; decision trees, neural networks, random forests, support vector machines.

Course Offered at: Prescott

DSCI 317 Statistical Software 3 Credits (3,0)

Statistical analysis software; script and GUI-based applications; regression analysis; time series analysis; autocorrelation; ARMA models.

Course Offered at: Prescott

DSCI 330 Applied Generative AI 3 Credits (3,0)

Introduction to generative AI concepts, tools, and use cases. Overview of platforms like ChatGPT, DALL-E, and Midjourney. Basics of prompt engineering and hands-on platform usage. Text summarization, rewriting, translation, sentiment analysis, and chatbot development. Visual content generation using tools like Stable Diffusion and DALL-E. Multimedia applications for posters, infographics, and promotional content.

Course Offered at: Daytona Beach, Worldwide

DSCI 390 Research Project in Industrial Mathematics 3 Credits (3,0)

Data-enabled research projects based on real-world problems provided by businesses, industry, and government. Problem formulation, data visualization, analysis, written and oral communication, teamwork.

Prerequisites: MATH 243

Course Offered at: Daytona Beach

DSCI 399 Special Topics in Data Science 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in data science.

Course Offered at: Daytona Beach, Prescott, Worldwide

DSCI 412 Data Visualization 3 Credits (3,0)

Information and scientific visualization; computer graphics and related mathematics. Representation of data graphically; exploratory data analytics for insight. Use of software for interactive display analysis and explanations.

Prerequisites: MATH 335 or MATH 392

Course Offered at: Daytona Beach, Prescott

DSCI 413 Statistics for Data Science 3 Credits (3,0)

Statistical techniques for data analysis. Sampling distributions, regression and classification analysis, AI models from a statistical perspective, and statistical software packages.

Daytona Beach Prerequisites: MATH 243

Prescott Prerequisites: MATH 412

Worldwide Prerequisites: MATH 412

Course Offered at: Daytona Beach, Prescott, Worldwide

DSCI 440 Data Mining 3 Credits (3,0)

Types of data; data quality; preprocessing. Classification models: decision trees, K-nearest neighbors, support vector machines, Naive Bayes classifiers. Ensemble models: random forests, AdaBoost. Unsupervised learning: association, clustering, anomaly detection. Imbalanced classes and their impact.

Daytona Beach Prerequisites: MATH 243 and MATH 305

Worldwide Prerequisites: MATH 243 and (MATH 305 or CPSC 251)

Course Offered at: Daytona Beach, Prescott, Worldwide

DSCI 483 Cloud Computing 3 Credits (3,0)

Computing and data analysis in cloud environments. Cloud services; latency, availability, scalability; configuration of virtualized clusters; distributed data storage and analysis.

Course Offered at: Prescott

DSCI 490 Data Science Capstone 3 Credits (3,0)

Capstone project integrating data science learning outcomes. Data acquisition, cleaning, exploration, modeling, visualization, and presentation to technical and non-technical audiences.

Course Offered at: Daytona Beach, Prescott

DSCI 491 Applied Data Science Capstone 3

Credits (3,0)

Term-long data project, with work processes mirroring the workplace environment. Peer review and instructor feedback. Final report written and presented virtually.

Prerequisites: CPSC 251 or STAT 320 or DSCI 201

Course Offered at: Worldwide

DSCI 499 Special Topics in Data Science 1-6

Credit (1-6,0)

Individual, independent, or directed studies of selected topics in data science.

Course Offered at: Daytona Beach, Prescott, Worldwide