

DECISION SCIENCE (DSCI)

DSCI 245. BUSINESS STATISTICS 1. 4 Credits.

Pre-requisites: one of the following: MATH 142, MATH 161, HONS 161 or MATH 200 with a grade \geq C.

An introduction to decision making in the business environment using statistical and data analysis procedures. Computer software is used extensively. Written communication skills are emphasized as a means to incorporate analysis results into the decision making process. Topical coverage includes discrete and continuous probability distributions, sampling distributions, estimation and hypothesis testing.

DSCI 297. WORKSHOP, SHORT COURSE, CONFERENCE, SEMINAR. 1-5 Credits.

DSCI 299. DIRECTED STUDY. 1-15 Credits.

DSCI 346. BUSINESS STATISTICS 2. 4 Credits.

Pre-requisites: DSCI 245 and one of the following: MATH 142, MATH 161, HONS 161, (MATH 200 with a grade \geq C) or permission of the instructor. This course offers an in-depth study of decision making in the business environment using statistical and data analysis procedures. Statistical methods used in decision making include chi-square tests, analysis of variance, correlation, simple and multiple regression, time series analysis, and forecasting. Computer software is used extensively for both analysis and presentation. Case studies or projects are used to integrate statistical methods with problem solving and communication skills.

DSCI 352. MIXED RESEARCH METHODS, SECURITY AND ETHICS FOR ANALYTICS. 4 Credits.

Pre-requisites: DSCI 245 or permission of the instructor.

This course introduces mixed methods research, specifically concentrating on the intersection of qualitative and quantitative data in a single research project. Research ethics as applied in the real world are of particular interest, with specific focus on the Family Educational Rights and Privacy Act (FERPA) and the Health Insurance Portability and Accountability Act (HIPAA).

DSCI 353. DATA MANAGEMENT, CLEANING AND IMPUTATION. 4 Credits.

Pre-requisites: DSCI 245 or permission of the instructor.

This course introduces applied data mining skills, that is location of errors and inconsistencies in data sets, missing value management and the impact of these methods of data analytic methods, and data transformations used to meet model assumptions for appropriate data analytic methods.

DSCI 399. DIRECTED STUDY. 1-5 Credits.

Pre-requisites: permission of the instructor, department chair and college dean.

DSCI 445. OPTIMIZATION VIA MANAGEMENT SCIENCE. 4 Credits.

Pre-requisites: DSCI 346 or permission of the instructor.

Business analytics is a hybrid of information systems, applied statistics, management science, data analysis, operations research, consumer behavior, risk management, and decision support. The focus of this particular course is the optimization of spreadsheet decision models in a business environment. Topics may include linear programming, network modeling, goal programming, nonlinear programming, regression, data mining, forecasting, simulation, queuing theory and decision analysis.

DSCI 446. BUSINESS FORECASTING. 4 Credits.

Pre-requisites: DSCI 346 or permission of the instructor.

Integrates several forecasting models with applications to managerial techniques. Topics include regression, multiple regression, time series analysis, autocorrelation, econometric models, exponential smoothing, autoregressive models, adaptive filtering, Box Jenkins methods, and survey techniques. The computer is employed to develop meaningful forecasts for management.

DSCI 447. DESIGN OF EXPERIMENTS. 4 Credits.

Pre-requisites: DSCI 346 or permission of the instructor.

An in-depth study of quantitative business analysis techniques in a variety of organizational environments. Emphasizes the use of the computer and a discussion of quality in the organizational setting.

DSCI 448. BUSINESS SIMULATION. 4 Credits.

Pre-requisites: DSCI 346 or permission of the instructor.

An examination of probabilistic models in decision science, with emphasis on discrete event simulation.

DSCI 449. MULTIVARIATE DATA ANALYSIS. 4 Credits.

Pre-requisites: DSCI 346 or permission of the instructor.

Examines the concepts and principles of the various statistical methods used in the analysis of multiple simultaneous measurements on the subjects under investigation. Multivariate data analysis methods are used in fields such as business, engineering, education, data mining and many others. Software is heavily used to support the studies in this course.

DSCI 450. DATA VISUALIZATION. 4 Credits.

Pre-requisites: DSCI 346 or permission of the instructor.

Data visualization helps people understand the information within data by placing it in a visual context. As statistical results are often communicated poorly in the media, in scientific journals and in business, this course examines methods used in the presentation of these results to non-statistically oriented audiences. A variety of software packages are used to develop appropriate data visualizations. Non-technical writing and presentation skills are emphasized.

DSCI 481. ML-DATA SCIENCE FUNDAMENTALS. 4 Credits.

Pre-requisites: DSCI 353, MISC 373 and MATH 142 (MATH 161 preferred) or permission of the instructor.

Focuses on enhancing skills in data exploration, data queries, data analysis, data ethics and data visualization.

DSCI 483. ML-APPLIED DATA SCIENCE. 4 Credits.

Pre-requisites: DSCI 481.

Focuses on programming languages for manipulating and wrangling data and then developing applied skill in structured and unstructured machine learning.

DSCI 489. SENIOR PROJECT. 4 Credits.

Pre-requisites: declared major in Business Systems and Analytics, and DSCI 450 and MISC 485 (may be taken concurrently).

Provides students with the opportunity to experience real-world scenarios in which direction in vague and stakes are similar to those experienced by professionals.

DSCI 490. ANALYTICS SENIOR CAPSTONE. 4 Credits.

Notes: to be taken in the final quarter of instruction.

Pre-requisites: DSCI 450; MISC 485, may be taken concurrently; and a declared Analytics Major.

Satisfies: a university graduation requirement—senior capstone.

Provides students the opportunity to experience real-world scenarios in which direction is vague and stakes are similar to those experienced by professionals. BS in Data Analytics sections also have components to complete in Microsoft Learn and Microsoft Role-Based certifications.

DSCI 495. PROFESSIONAL INTERNSHIP. 1-15 Credits.

DSCI 498. SEMINAR. 1-15 Credits.

DSCI 499. DIRECTED STUDY. 1-5 Credits.

Pre-requisites: permission of the instructor, department chair and college dean.