BUSINESS ANALYTICS

BUA 250 | CAREER MANAGEMENT SKILLS | 2 quarter hours
(Undergraduate)
This course helps business analytics major students develop their careers. Students review their skills and interests as they relate to relevant career paths and professions. They acquire career-enhancing skills in job search, career research, goal setting, and action planning. Students create resumes and cover letters, and they enhance their interviewing and networking skills. Through activities, students assess their current career activities and explore appropriate adjustments. This course is designed for students who have declared (or intend to declare) majors in Business Analytics.

BUA 301 | DESCRIPTIVE AND DIAGNOSTIC BUSINESS ANALYTICS | 4 quarter hours
(Undergraduate)
This course introduces students to fundamental business analytics concepts and work processes. Students will develop their business analytics knowledge and skills by learning to formulate and address business questions with data, performing reproducible analytics with an open-source scripting language (e.g., R, Python), iterating typical analytical steps (e.g., importing, cleaning, analyzing data), describing and summarizing business data, computing bivariate relations, applying ordinary-least squares regression to model continuous business outcomes, and applying logistic regression to model binary business outcomes. Along the way, students will engage in mastery-learning orientation as they complete assignments. By the end of the course, students will feel prepared to apply their business analytics knowledge and skills to perform fundamental business analytics work tasks.
A grade of C- or better in BUS 102 is a prerequisite for this class.

BUA 302 | PREDICTIVE AND PRESCRIPTIVE BUSINESS ANALYTICS | 4 quarter hours
(Undergraduate)
This course introduces students to predictive and prescriptive business analytics. In the first part of the course, students will learn how to apply a supervised learning workflow to predict outcomes. This includes learning how to apply supervised learning methods such as elastic nets and ensemble trees, tuning hyperparameters of these methods, training these algorithms on training data, and evaluating trained algorithms on testing data. In the second part of the course, students will learn the fundamentals of using models for explanatory purposes. This includes learning how to work with data collected from experiments (e.g., A/B tests) and quasi-experiments (e.g., field data). By the end of the course, students will feel prepared to apply their predictive and prescriptive analytics knowledge and skills to perform fundamental business analytics work tasks.
A grade of C- or better in BUA 301 is a prerequisites for this class.

BUA 303 | DATA VISUALIZATION | 4 quarter hours
(Undergraduate)
This course introduces students to data visualization for business analytics. In this course, students learn how to work with data visually and produce visuals for various business stakeholders. Specific topics include understanding data visualization principles, building different types of charts, developing dynamic and interactive charts, and creating dashboards and storyboards. Throughout the course, students will engage in active learning by completing individual assignments on business data to develop their data visualization knowledge and skills. Students will also learn how to incorporate visualization into clear and compelling communication. After completing the course, students will feel prepared to apply their data visualization knowledge and skills to business analytics projects.
A grade of C- or better in BUA 301 is a prerequisites for this class.

BUA 304 | DATA MANAGEMENT | 4 quarter hours
(Undergraduate)
This course covers data management skills for business analysts such as developing database structure so that the relations database using Structured Query Language (SQL) will be robust, resistant to errors, and flexible enough to accommodate a reasonable amount of future change. It also covers how to discover database requirements, build data models, and refine those models to improve the database's effectiveness.
A grade of C- or better in BUA 301 is a prerequisites for this class.

BUA 320 | ARTIFICIAL INTELLIGENCE AND COGNITIVE TECHNOLOGIES | 4 quarter hours
(Undergraduate)
This course provides students with an overview of modern artificial intelligence technology and its applications in the real world. Students will study the fundamentals of AI models and how they can be used to generate value for an organization. Through lectures, case studies, and hands-on activities, students will explore the potential of AI to solve complex problems. Additionally, students will gain insights into the impact of AI on industry, legal and ethical implications of its use, and how it can be leveraged to transform business processes.
A grade of C- or better in BUS 102 and a grade of C- or better in MAT 137 are prerequisites to this class.

BUA 321 | TEXT ANALYTICS FOR BUSINESS | 4 quarter hours
(Undergraduate)
This course provides students with a theoretical and practical understanding of text analysis applied to marketing and business context. The first two weeks of the course provide a high-level theoretical initiation into frameworks that explain human communication, discourse and conversation. The rest of the course is devoted to hands-on learning and use of qualitative and quantitative methods for gathering, processing and analyzing textual data. Students will obtain a level of competence and understanding in skills including data mining (extracting raw data from public sources), preprocessing unstructured data, tagging themes in qualitative data, sentiment or opinion mining, and more.
A grade of C- or better in BUS 102 and a grade of C- or better in MAT 137 are prerequisites to this class.

BUA 322 | MACHINE LEARNING FOR BUSINESS ANALYTICS | 4 quarter hours
(Undergraduate)
This course advances student understanding of machine learning for business analytics. In the first part of the course, students will learn how to apply unsupervised learning for dimensionality reduction and clustering units. This includes learning how to apply several unsupervised learning methods for dimensionality reduction such as principal components analysis, singular value decomposition, and non-linear techniques, and clustering such as hierarchical clustering, partition methods, and model-based clustering. In the second part of the course, students will learn how to apply supervised learning for predicting categorical and continuous outcomes. This includes learning how to apply various supervised learning algorithms such as tree methods, support vector machines, and neural networks, and evaluating the predictive performance of such algorithms. By the end of the course, students will feel prepared to apply their machine learning knowledge and skills to perform fundamental business analytics work tasks.
A grade of C- or better in BUA 301 and a grade of C- or better in BUA 302 are prerequisites to this class.

BUA 340 | QUASI-EXPERIMENTAL DESIGN | 4 quarter hours
(Undergraduate)
Some of the most important questions in business and the social sciences involves causal relationships. Here are a few recent examples: How do paywalls affect digital media site usage? How does moving out of a high poverty neighborhood affect obesity and diabetes? How do price promotions affect the sale of our products? How will opening a new store location affect our total sales? These questions can't afford mere correlations. They require causal evidence. What assumptions are necessary to achieve this? And what do we even mean by causality? What about those warnings that correlation does not imply causation? What should we believe? This course is about the research designs and methods that researchers use to support causal inferences in business and the social sciences. The specific topics include randomized experiments, instrumental variables, regression discontinuity designs, difference-in-differences models, regression analysis, and propensity score matching. There are four broad goals of the course. The first is to learn some of the notation and language that social scientists use to describe causal effects. The second is to understand the logic and assumptions that support a set of research designs that are commonly used in quantitative social science research. The third is to gain some experience in implementing the methods using a statistical software package such as R. The fourth objective is to develop skill at reading, understanding, and critiquing "technical" scientific articles that make casual claims.
A grade of C- or better in BUA 302 and a grade of C- or better in ECO 304 are prerequisites to this class.