Business Analytics

**BUAN 6009** Business Analytics Internship (0 semester credit hours) Student gains experience and improves skills through appropriate developmental work assignments in a real business environment. Student must identify and submit specific business learning objectives at the beginning of the semester. The student must demonstrate exposure to the managerial perspective via involvement or observation. At semester end, student prepares an oral or poster presentation, or a written paper reflecting on the work experience. Student performance is evaluated by the work supervisor. Pass/Fail only. Prerequisites: (MAS 6102 or MBA major) and department consent required. (0-0) S

**BUAN 6311 (FTEC 6311)** Robotics and Financial Technology (3 semester credit hours) This course focuses on different robotic technologies used in finance. (3-0) Y

**BUAN 6312 (MECO 6312)** Applied Econometrics and Time Series Analysis (3 semester credit hours) A survey of techniques used in analyzing cross-sectional, time series and panel data with special emphasis on time series methods. Credit cannot be received for more than one of the following: BUAN 6312 or FIN 6318 or MECO 6312. Prerequisite or Corequisite: OPRE 6301 or OPRE 6359 or BUAN 6359 or FIN 6306 or FIN 6307 or SYSM 6303. (3-0) T

**BUAN 6320** Database Foundations for Business Analytics (3 semester credit hours) This course covers Structured Query Language (SQL) and NoSQL databases and focuses on understanding the differences, and to learn how to effectively query SQL and NoSQL databases. Topics include ER models, SQL, PL/SQL, query optimization, NoSQL database types, and NoSQL querying. Credit cannot be received for more than one of the following: BUAN 6320 or MIS 6326 or ACCT 6320 or ACCT 6321 or MIS 6320 or OPRE 6393. (3-0) Y

**BUAN 6324 (MIS 6324 and OPRE 6399)** Business Analytics With SAS (3 semester credit hours) This course covers theories and applications of business analytics. The focus is on extracting business intelligence from firms' business data for various applications, including (but not limited to) customer segmentation, customer relationship management (CRM), personalization, online recommendation systems, web mining, and product assortment. The emphasis is placed on the 'know-how' -- knowing how to extract and apply business analytics to improve business decision-making. Students will also acquire hands-on experience with business analytics software in the form of SAS Enterprise Miner. Credit cannot be received for more than one of the following: BUAN 6324 or BUAN 6356 or MIS 6324 or OPRE 6399. Prerequisite or Corequisite: OPRE 6301 or OPRE 6359 or BUAN 6359. (3-0) Y

**BUAN 6335 (SYSM 6335)** Organizing for Business Analytics Platforms (3 semester credit hours) The course develops conceptual understanding of platforms for business analytics and key business drivers that lead to business initiatives. The course examines how decision-makers in key functional areas of an enterprise rely on business analytics, how teams identify and develop analytical techniques to solve business problems, and how analytics platforms are adopted successfully. The course also emphasizes the development of business cases for strategic analytics initiatives and discusses best practices for descriptive, predictive, and prescriptive analytics. (3-0) T

**BUAN 6337 (MKT 6337)** Predictive Analytics Using SAS (3 semester credit hours) This course is designed to provide students with in-depth knowledge of the analytical techniques frequently used in marketing analytics. Students analyze data from real world datasets to make useful marketing decisions. These
econometric methods are commonly employed in online marketing, the retail sector, and financial services. Students will acquire knowledge about the methods and software that are used to understand issues such as who the profitable segments/customers are, how to acquire them, and how to retain them. The tools can also be used to manage brand prices and promotions using grocery scanner data. Prerequisite: **OPRE 6301** or **BUAN 6359** or **OPRE 6359**. (3-0) Y

**BUAN 6340** Programming for Data Science (3 semester credit hours) This course covers many aspects of programming for data science and analytics, including syntax, handling data, data visualization, and implementation of statistical analysis models. The course will be taught using Python language and may use a different programming language as applicable. Prerequisite: **BUAN 6356** or **MIS 6323** or **MIS 6334** or **MIS 6356** or **MIS 6382**. (3-0) Y

**BUAN 6341** (MIS 6341 and OPRE 6343) Applied Machine Learning (3 semester credit hours) This course covers machine learning models for business data including text mining, natural language processing, non-linear regression models, resampling methods and advanced neural networks and artificial intelligence-based models for data-driven analytics. The course will be taught using either R or Python language. Prerequisites: (**BUAN 6356** or **BUAN 6324** or **MIS 6324** or **OPRE 6399** and (**OPRE 6359** or **BUAN 6359**)). (3-0) Y

**BUAN 6342** Applied Natural Language Processing (3 semester credit hours) This is an advanced course focusing on natural language processing and the utility of textual data to gain meaningful quantitative and actionable insights about the language (mainly English) using rule-based and statistical methods and to extract the information for real-world applications. Our goal will be to create machine-learning programs that analyze and interpret human language using classical text, social media and business text/unstructured data. Prerequisite: **BUAN 6341**. (3-0) Y

**BUAN 6344** (MIS 6344) Web Analytics (3 semester credit hours) The course examines the technologies, tools, and techniques to maximize return from web sites. The course includes topics related to web site design issues, web data collection tools and techniques, measurement and analysis of web traffic, visitor tracking, search engine optimization, visitor acquisition, conversion and retention, key performance indicators for web sites, and measurement of online marketing campaigns. The use of web analytics tools such as Google Analytics will be an integral part of the course. (3-0) Y

**BUAN 6345** (MIS 6345) SAP Analytics (3 semester credit hours) This course provides students with in-depth knowledge of In-memory Business Intelligence tools and In-memory databases using SAP. The course features the SAP Analytics portfolio of solutions that provides a comprehensive set of modern business intelligence, augmented analytics (including predictive analytics), and enterprise planning capabilities that work together to analyze, predict, plan, and report on data wherever it resides. Students learn about different options available to speed up the queries and why In-memory tools are important. The course covers both the semantic layer modeling and front-end visualization aspects of the In-memory BI tool used. The course also covers the DML, DDL, and modeling techniques used for the In-memory database used. Students learn such concepts using hands-on exercises and practical assignments. The course requires a solid understanding of ER and dimensional modeling. (3-0) Y

**BUAN 6346** (MIS 6346) Big Data (3 semester credit hours) This course covers topics including (1) understanding of big data concepts, (2) manipulation of big data with popular tools, and (3) distributed analytics programming. It is a project-oriented course; thus, students will be required to establish a big data environment, perform various analytics, and report findings in their projects. Though concepts and theoretical aspects are addressed, more emphasis will be on actual operations of a big data system. Students will not only manipulate the basic big data software/system, but also use various dedicated big-
data tools and perform distributed analytics programming with popular computer languages. Prerequisite: **BUAN 6320** or **MIS 6320** or **MIS 6326**. (3-0) Y

**BUAN 6347** Advanced Big Data Analytics (3 semester credit hours) The course covers Spark using Scala in a Hadoop environment. The topics include Scala syntax, Spark streaming, GraphX, MLlib, and other features of Spark. This advanced course requires students to have prior skills and working knowledge of big data environment and Python functional programming. Prerequisite: **BUAN 6346**. (3-0) Y

**BUAN 6356** (MIS 6356 and OPRE 6305) Business Analytics With R (3 semester credit hours) This course covers theories and applications of business analytics. The focus is on extracting business intelligence from firms' business data for various applications, including (but not limited to) customer segmentation, customer relationship management (CRM), personalization, online recommendation systems, web mining, and product assortment. The emphasis is placed on the 'know-how' -- knowing how to extract and apply business analytics to improve business decision-making. Students will also acquire hands-on experience with business analytics software in the form of R. Credit cannot be received for both courses, **BUAN 6324** and **BUAN 6356**. Prerequisite or Corequisite: **BUAN 6359** or **OPRE 6359**. (3-0) Y

**BUAN 6357** (MIS 6357) Advanced Business Analytics with R (3 semester credit hours) This course is based on the open-source R software. Topics include data manipulation, imputation, variable selection, as well as advanced analytic methods. Students will also learn various advanced business intelligence topics including business data analytics, modeling, customer analytics, web intelligence analytics, business performance analytics, and decision-making analytics. Tools to be used include R. Credit cannot be received for both courses, **MIS 6334** or **OPRE 6334** and (**BUAN 6357** or **MIS 6357**). Prerequisites: (**BUAN 6356** or **MIS 6356** or **OPRE 6305** and (**OPRE 6359** or **BUAN 6359**). (3-0) Y

**BUAN 6358** (MIS 6347) AWS Cloud Analytics (3 semester credit hours) This course aims to help students learn how to use cloud services to build an enterprise platform for data analytics and machine learning. The course will help students develop skills with AWS services that are critical for conducting an analysis of big data problems. Through a series of hands-on labs, students will learn how to use AWS services and build a data pipeline to source data from other systems as well as streaming data, ingest, store, process, and visualize data. Additionally, students will be able to select and apply machine learning services to resolve business problems. They will also be able to label, build, train, and deploy a custom machine learning model through a guided, hands-on approach. Finally, the course will help students prepare for AWS certifications in Data Analytics and Machine Learning. Corequisite or Prerequisite: **MIS 6363**. (3-0) Y

**BUAN 6359** (OPRE 6359) Advanced Statistics for Data Science (3 semester credit hours) This course uses statistical methods to analyze data from observational studies and experimental designs to communicate results to a business audience. The course mandates prior knowledge of fundamental statistical concepts such as measures of central location, standard deviations, histograms, the normal and t-distributions (knowledge of calculus is not required). The course also emphasizes interpretation and inference, as well as computation using a statistical software package such as R or STATA. Credit cannot be received for both: **OPRE 6301** and (**OPRE 6359** or **BUAN 6359**). (3-0) S

**BUAN 6382** Applied Deep Learning (3 semester credit hours) This is a basic course focusing on the fundamentals of Deep Learning applied to business data. Students will learn to apply various neural network architectures like Feedforward Artificial Neural Networks, Convolutional Neural Networks, Recurrent Neural Networks, Transfer learning for computer vision, and Generative Adversarial Networks in a variety of business scenarios. Prerequisite: **BUAN 6341** or **MIS 6341** or **OPRE 6343**. (3-0) Y

**BUAN 6385** (MIS 6385) Robotic Process Automation (3 semester credit hours) This course is intended to
provide students with practical literacy on robotic process automation through real-world, relevant data preparation use cases. It will help identify potential uses and the benefits and considerations for robotic process automation. The students will learn the elements of a business process and the basics of developing a BPM application, implementing triggers to automate processes, defining and measuring KPIs. Students will use elements of artificial intelligence (AI) and machine learning capabilities to handle high-volume, repeatable tasks that previously required humans to perform. These tasks can include queries, calculations, and maintenance of records and transactions. Students will be able to use apply analytics to the generated data for a systematic computational analysis of data for the discovery, interpretation, and communication of meaningful patterns in data that will be used towards effective decision making. (3-0) S

**BUAN 6386 (MIS 6371)** SAP Cloud Analytics (3 semester credit hours) The course allows students to learn about the capabilities of SAP Analytics Cloud that combines business intelligence, planning, predictive, and augmented analytics capabilities into one cloud environment to support business processes. Students also learn about SAP AI technologies and an in-memory database, which are part of the SAP Analytics Cloud. Students will also learn about Augmented Analytics which helps users ask questions in a conversational manner and get instant results explained in natural language, detect drivers of a KPI and take the best action using automated machine learning that discovers unknown relationships in data and predict outcomes, generate forecasts and automate predictive planning. Students also learn about the modeling environment to create planning models and import data, as well as the standard planning features available in the story. Advanced planning capabilities like value-driver trees, data actions, advanced formulas, and allocations, combined with Smart Predict, an environment to create and train predictive models. (3-0) S

**BUAN 6390** Analytics Practicum (3 semester credit hours) Student gains experience and improves analytics skills through appropriate developmental work assignments in a real business environment. Student must identify and submit specific business learning objectives at the beginning of the semester. Student must demonstrate exposure to the managerial perspective via involvement or observation. At semester end, student prepares an oral or poster presentation or a written paper reflecting on the work experience. Prerequisites: (MAS 6102 or MBA major) and department consent required. (3-0) S

**BUAN 6392 (MIS 6392)** Causal Analytics and A/B Testing (3 semester credit hours) This course focuses on the distinction between correlation and causation in data. This distinction is critical for managers to understand the effect of proposed managerial interventions. For example, an advertiser may want to know whether referral marketing interventions will be effective for its customers, and, if so, what types of messages may be used to implement a referral marketing program with a high degree of success. Similarly, a music service like Spotify may want to know what kinds of promotions will help increase the number of subscribers in the most effective way. The course will focus on the design and analysis of A/B tests to tease out the difference between correlation and causation. It will also focus on statistical techniques that can be used with observational data to achieve reliable causal inferences in the absence of experimental data. The course employs a combination of lectures, cases, and in-class exercises to introduce the course material. It takes a hands-on approach, exposing students to simulated and real-world datasets, and equipping them with tools they can leverage immediately on the job. Prerequisite: OPRE 6301 or OPRE 6359 or BUAN 6359. (3-0) Y

**BUAN 6398 (OPRE 6398)** Prescriptive Analytics (3 semester credit hours) Introduction to decision analysis and optimization techniques. Topics include linear programming, decision analysis, integer programming, and other optimization models. Applications of these models to business problems will be emphasized. Prerequisite: OPRE 6301 or OPRE 6359 or BUAN 6359. (3-0) S
BUAN 6V98 Business Analytics Internship (1-3 semester credit hours) Student gains experience and improves skills through appropriate developmental work assignments in a real business environment. Student must identify and submit specific business learning objectives at the beginning of the semester. The student must demonstrate exposure to the managerial perspective via involvement or observation. At semester end, student prepares an oral or poster presentation, or a written paper reflecting on the work experience. Student performance is evaluated by the work supervisor. Pass/Fail only. May be repeated for credit as topics vary (3 semester credit hours maximum). Prerequisites: (MAS 6102 or MBA major) and department consent required. ([1-3]-0) S

BUAN 6V99 Special Topics in Business Analytics (1-6 semester credit hours) May be repeated for credit as topics vary (6 semester credit hours maximum). Instructor consent required. ([1-6]-0) S