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)** Financial Technology I (3 semester credit hours) This course builds on financial information and analytics to understand and develop new financial technologies. (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 for those interested in a career in marketing analytics. Students analyze data from large databases to make important marketing decisions. These methods are commonly employed in online marketing, grocery
stores, and in financial markets. Students will acquire knowledge about the tools and software that are used to understand issues such as who the profitable customers are, how to acquire them, and how to retain them. The tools can also be used to manage brand prices and promotions using scanner data as is done in supermarkets. Prerequisite: **OPRE 6301 or OPRE 6359 or BUAN 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 6345 (MIS 6345)** High Performance Analytics with SAP (3 semester credit hours) This course provides students with in-depth knowledge of In-memory Business Intelligence tools and In-memory databases. 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 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: OPRE 6301 or 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 6301 or OPRE 6359 or BUAN 6359). (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 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: (\textit{MAS 6102} or MBA major) and department consent required. ([1-3]-0) S

\textbf{BUAN 6V99} Special Topics in Business Analytics (1-6 semester credit hours) May be lecture, readings, or individualized study. May be repeated for credit as topics vary (6 semester credit hours maximum). Instructor consent required. ([1-6]-0) S