MASTER OF SCIENCE IN BUSINESS ANALYTICS (MSBA)

MSBA 500 | INTRODUCTION TO DATA ANALYTICS & BUSINESS CONCEPTS
Units: 2 Repeatability: No
This course introduces the data analytics process (acquisition, exploration, pre-processing, analysis, etc.) and concepts (data sources, structured vs. unstructured data, descriptive / prescriptive / predictive analytics). There will be an emphasis on formulating the problem and defining data needs and missing data issues. Students will develop key skills in Excel, including shortcut keys, text functions, date functions, logical functions, aggregate functions, if statements, vlookup, index match, nested statements, filters, pivot tables, and macros.

MSBA 501 | APPLIED STATISTICS
Units: 2 Repeatability: No
Prerequisites: MSBA 500 with a minimum grade of C- (Can be taken Concurrently)
This course examines how managers use data as the key input for systematic business problem-solving. Topics will include collecting data, describing and presenting data, probability, statistical inference, regression analysis, forecasting, and risk analysis. Special emphasis will be given to computer techniques, especially using Excel, for statistical analysis and problem solving. Students will gain experience with common business processes and business skills practiced such as gathering and organizing data, quantitative data analysis, forecasting, decision-making under uncertainty and communicating or presenting results.

MSBA 502 | ANALYTICS PROGRAMMING I
Units: 2 Repeatability: No
Prerequisites: MSBA 500 with a minimum grade of C-
This course will apply programming skills in Python and R for predictive analytics. Topics will include, but not be limited to, programming, repository management, preprocessing and cleaning data, documentation and reproducibility, machine learning, and validation. Students will understand how to clean a data set and apply a predictive algorithm using the edited data.

MSBA 503 | ANALYTICS PROGRAMMING II
Units: 2 Repeatability: No
Prerequisites: MSBA 502 with a minimum grade of C-
This course is a continuation of Analytics Programming I with a focus on unstructured data and analytical tools, artificial intelligence and machine learning. Students will apply these tools using Python and R.

MSBA 504 | DATA MANAGEMENT
Units: 2 Repeatability: No
Prerequisites: MSBA 500 with a minimum grade of C-
This course will provide students with an introduction to relational databases concepts, data warehousing, and Structure Query Language (SQL).

MSBA 505 | INTERACTIVE DATA VISUALIZATION
Units: 3 Repeatability: No
Prerequisites: MSBA 501 with a minimum grade of C-
Building upon relational database concepts, this course will focus on the principles of effective data visualizations, and interactive data visualization. Tools covered will be Tableau and Power BI.

MSBA 506 | PRESCRIPTIVE ANALYTICS
Units: 2 Repeatability: No
Prerequisites: MSBA 501 with a minimum grade of C-
This course will provide students with the skills necessary to be able to approach decision making in a systematic manner. Using spreadsheets as the medium, this course will examine such topics as modeling, decision analysis tools, constrained optimization methods, and Monte Carlo simulation. This course will also provide students with experience using these tools in such areas as marketing, finance and operations.

MSBA 507 | DATA FOR SOCIAL GOOD
Units: 3 Repeatability: No
Prerequisites: MSBA 500 with a minimum grade of C-
This course will explore how data is used in non-profits, schools, granting agencies and social enterprises to further an organizations ability to address its triple bottom line. In this class, different analytics techniques will be explored to investigate social impact analysis, marketing analytics for non-profits, donor data analytics, funding analytics for foundations and business efficiencies as they relate to the building, measuring and monitoring of social programming.

MSBA 510 | INTERNATIONAL CONSULTING PROJECT
Units: 3 Repeatability: No
Prerequisites: MSBA 503 with a minimum grade of C-
Students will work in teams to design and develop solutions to a business problem or strategic initiative for a company abroad. The project will provide hands-on experience of the people, markets, economic policies, and business practices of the country in which the company operates. Students will apply creativity and analytical tools to complete the project and communicate results to clients.

MSBA 511 | DATA MINING FOR BUSINESS ANALYTICS
Units: 3 Repeatability: No
Prerequisites: MSBA 503 with a minimum grade of C-
This course will develop students' data literacy by discussing current data mining techniques and practices in business contexts. Topics include: market basket analysis, recommender systems and collaborative filtering, clustering and segmentation, classification (decision trees, neural networks, and logistic regression etc.), text analytics. For each of these techniques, the emphasis will be on developing the intuition with the aim of business application. The algorithmic details will be covered only to the extent necessary to understand when and how each technique can be used. Students will use IBM SPSS Modeler throughout this course to independently conduct data mining / predictive analytics projects.

MSBA 512 | CAPSTONE PROJECT
Units: 3 Repeatability: No
Prerequisites: MSBA 510 with a minimum grade of C-
Students will work in teams with an industry partner to refine a business problem, identify necessary data to solve the problem, and statistically analyze existing data to develop solutions to the business problem or strategic initiative. Using company-specific data students will utilize the programming, statistical, and business knowledge learned during the program to develop a solution to a business problem for the industry partner. Each team will have a faculty advisor and a key industry partner. Students will have interim presentations to the client and to classmates. Students will complete the project and communicate the results to clients via a presentation and a written report.

MSBA 530 | ACCOUNTING ANALYTICS
Units: 3 Repeatability: No
Prerequisites: MSBA 503 with a minimum grade of C-
This course will explore how financial statement data and non-financial metrics can be linked to financial performance. In this course, students will learn how data is used to assess what drives financial performance and to forecast future financial scenarios. While many accounting and financial organizations deliver data, accounting analytics deploys that data to deliver insight, and this course will explore the many areas in which accounting data provides insight into other business areas including consumer behavior predictions, corporate strategy, risk management, optimization, and more. By the end of this course, students will understand how financial data and non-financial data interact to forecast events, optimize operations, and determine strategy.

MSBA 531 | FORECASTING / APPLIED TIME SERIES ANALYSIS
Units: 3 Repeatability: No
Prerequisites: MSBA 503 with a minimum grade of C-
This course will examine the business cycle and techniques for forecasting fluctuations. The emphasis of the course will be to gain hands-on exposure to specific business forecasting techniques and learn to apply them to limit the range of uncertainty in management decision making. Specific techniques covered will include lead-lag, exponential smoothing, and econometric and ARIMA (Box-Jenkins) time series analysis.

MSBA 532 | FINANCIAL ANALYTICS
Units: 3 Repeatability: No
Prerequisites: MSBA 503 with a minimum grade of C-
This course will provide a detailed, hands-on examination of financial modeling techniques applied to optimal decision making in the areas of corporate finance and investment banking. Topics will include the construction of comprehensive valuation models (including capital structure and dividend policy modifications), use of precedent transactions and comparable companies in valuation, strategic industry examination, and application of valuation in the context of mergers and acquisitions. Students will make extensive use of Microsoft Excel.

MSBA 533 | DIGITIZATION AND AGILE DECISION MAKING
Units: 3 Repeatability: No
Prerequisites: MSBA 503 with a minimum grade of C-
This course will prepare students to understand the main elements of the digital transformation process and apply their knowledge to a case company. The course will cover academic and practitioner insights and frameworks relating to business analytics and digitization. This includes key data analytics tools, major decision support tools, data visualization, and digitization.

MSBA 534 | MARKETING ANALYTICS
Units: 3 Repeatability: No
Prerequisites: MSBA 505 with a minimum grade of C-
This course will take an applied, data driven, approach to understanding how analytics can help firms with various insights such as measuring the effectiveness of promotions, estimating sales, and segmenting their customers. Students will learn how different types of data and analytical methodologies can be used to solve these problems. They will also develop proficiency in communicating their insights to a managerial audience.

MSBA 535 | OPERATIONS & SUPPLY CHAIN ANALYTICS
Units: 3 Repeatability: No
Prerequisites: MSBA 503 with a minimum grade of C-
This course will develop advanced ability to use quantitative methods and Excel spreadsheet to build effective models for operational decisions. In the first part of the course, students will learn several analytical tools for operational decision making, including inventory management, demand forecast and capacity analysis. Students will apply those skills in a simulation to manage a company. In the second part of the course, students will focus on advance spreadsheet modeling that integrate optimization, simulation and decision analysis.

MSBA 594 | SPECIAL TOPICS
Units: 3 Repeatability: Yes (Repeatable if topic differs)
Prerequisites: MSBA 500 with a minimum grade of C-
Topics of current interest in business analytics study. Course content and structure will differ depending on instructor. Students should consult their advisor for course description(s) for any given semester.

MSBA 598 | INTERNSHIP
Units: 1-3 Repeatability: Yes (Can be repeated for Credit)
Applied learning experience working for a business, government, or nonprofit organization. Students undertaken individual project or employer designated internship program. Grading is Pass/Fail.