MSBA (MSBA)

MSBA 400. Linear Algebra. 1 Unit.
The objective of this one-credit hour course is to provide a basic working knowledge of material in linear algebra that is relevant to the MSM-OR/SC and MSM-BA programs. This background material includes geometric and algebraic properties of vectors and matrices together with operations that can be performed on them. The use of vectors and matrices in solving systems of linear equations is taught. Offered as MSOR 400 and MSBA 400. Prereq: For MSM-Business Analytics students and MSM-Business Analytics Integrated students only.

MSBA 406A. Operations Management I. 1.5 Unit.
Operations managers, ranging from supervisors to vice presidents, are concerned with the production of goods and services. More specifically, they are responsible for designing, running, controlling and improving the systems that accomplish production. This course is a broad-spectrum course with emphasis on techniques helpful to the practice of management at the analyst level. Its goal is to introduce you to the environments, to help you appreciate the problems that operations managers are confronted with, and provide you with the tools to address these problems. Operations Management spans all value-adding activities of an organization including product and process design, production, service delivery, distribution network and customer order management. As global competition in both goods and services increases, a firm's survival depends upon how well it structures its operations to respond quickly to changing consumer needs. Thus, it is essential for all business managers to acquire an understanding of operations management to maintain their competitive advantage. This course provides an overview of Quality management, Material Requirements planning, Inventory management, and Supply Chain management. The emphasis of the course is on both real world applications and technical problem solving. Several manufacturing and non-manufacturing environments will be discussed explicitly, like health care, insurance, hotel-management, airlines and government related operations. Also we will explore the interface of operations management with other functional areas such as marketing, finance, accounting, etc. This coursework includes individual and group assignments, case analyses and experiential learning through simulations and educational games. Prereq: For MSM Business Analytics and MSM Business Analytics Integrated students only and MSBA 406A.

MSBA 406B. Operations Management II. 1.5 Unit.
Operations managers, ranging from supervisors to vice presidents, are concerned with the production of goods and services. More specifically, they are responsible for designing, running, controlling and improving the systems that accomplish production. This course is a broad-spectrum course with emphasis on techniques helpful to the practice of management at the analyst level. Its goal is to introduce you to the environments, to help you appreciate the problems that operations managers are confronted with, and provide you with the tools to address these problems. Operations Management spans all value-adding activities of an organization including product and process design, production, service delivery, distribution network and customer order management. As global competition in both goods and services increases, a firm's survival depends upon how well it structures its operations to respond quickly to changing consumer needs. Thus, it is essential for all business managers to acquire an understanding of operations management to maintain their competitive advantage. This course provides an overview of Quality management, Material Requirements planning, Inventory management, and Supply Chain management. The emphasis of the course is on both real world applications and technical problem solving. Several manufacturing and non-manufacturing environments will be discussed explicitly, like health care, insurance, hotel-management, airlines and government related operations. Also we will explore the interface of operations management with other functional areas such as marketing, finance, accounting, etc. This coursework includes individual and group assignments, case analyses and experiential learning through simulations and educational games. Prereq: For MSM Business Analytics and MSM Business Analytics Integrated students only and MSBA 406A.

MSBA 407A. Managerial Marketing I. 1.5 Unit.
This course is part one of the Core Marketing Management class, as taught in typical MBA programs, including our own. Marketing management is defined as the ‘art and science of choosing target markets and getting, keeping, and growing customers through creating, delivering, and communicating superior customer value’ (Kotler and Keller 2012, p. 3). This course addresses the management challenges of developing products and services that profitably deliver value including selecting target markets and designing the best combination of marketing variables to carry out a firm’s strategy. Prereq: For MSM Business Analytics and MSM Business Analytics Integrated students only.

MSBA 407B. Managerial Marketing II. 1.5 Unit.
This course is part one of the Core Marketing Management class, as taught in typical MBA programs, including our own. Marketing management is defined as the ‘art and science of choosing target markets and getting, keeping, and growing customers through creating, delivering, and communicating superior customer value’ (Kotler and Keller 2012, p. 3). This course addresses the management challenges of developing products and services that profitably deliver value including selecting target markets and designing the best combination of marketing variables to carry out a firm’s strategy. MSM Business Analytics students and MSM Business Analytics Integrated students only and MSBA 407A.
MSBA 410. Accounting and Financial Management. 3 Units.
This course focuses on learning the language of business, how basic accounting information is reported and analyzed, and how basic financial principles can be applied to understanding how value is created within an enterprise. This course is intended for individuals who have a limited background in accounting, finance and business. Most of the exercises will involve evaluating and building models in Excel. Teaching objectives are fairly straightforward: 1. Provide you with a basic understanding of the key principles of accounting and finance. We will quickly cover material that is typically covered in a three-course sequence (Introductory Accounting and Finance I and II). We will fly at a fairly high level, but we want to make sure you understand the basic concepts. 2. Apply these concepts to real (but straightforward) business situations, to gain a better understanding of how companies utilize accounting and financial information. 3. Time permitting, explore how these concepts can be applied to securities, mergers and acquisitions and leveraged buyout transactions, with a specific emphasis on how these concepts are likely to surface in your role in such transactions. Offered as MSBA 410 and MSOR 410. Prereq: For MSM-Business Analytics students and MSM-Business Analytics Integrated students only.

MSBA 411. Operations Analytics: Deterministic. 3 Units.
The first half of the course provides a practical coverage of linear programming, a special type of mathematical model. The art of formulating linear programs is taught through the use of systematic model-building techniques. The simplex algorithm for solving these models is developed from several points of view: geometric, conceptual, algebraic, and economic. The role and uses of duality theory are also presented. Students learn to obtain and interpret a solution from a computer package and how to use the associated output to answer "What-happens-if..." questions that arise in post-optimality analysis. Specific topics include: problem formulation, geometric and conceptual solution procedures, the simplex algorithm (phase 1 and phase 2), obtaining and interpreting computer output, duality theory, and sensitivity analysis. The second half of this course provide a practical approach to formulating and solving combinatorial optimization problems in the areas of networks, dynamic programming, project management (CPM), integer programming, and nonlinear programming. The art of formulating problems, understanding what is involved in solving them, and obtained and interpreting the solution from a computer package are shown. A comparison with formulating and solving linear programming problems is provided as a way to understand the advantages and disadvantages of some of these problems and solutions procedures. Recommended preparation: Knowledge of Excel, one semester each of undergraduate linear algebra and undergraduate calculus (derivatives); or consent of instructor. Prereq: For MSM-Business Analytics students and MSM-Business Analytics Integrated students only.

MSBA 432. Operations Analytics: Stochastic. 3 Units.
This course covers modeling and analysis of discrete-event dynamical systems using computer simulations. Topics include an introduction to simulation as a modeling tool, with emphasis on understanding the structure of a simulation model and how to build such models, model validation, random number generation, simulation languages, statistical simulation output analysis, design of simulation experiments and selected current research topics. Prereq: For MSM-Business Analytics students and MSM-Business Analytics Integrated students only.

MSBA 433. Foundations of Probability and Statistics. 3 Units.
Data of many kinds are typically available in practice, but the challenge is to use those data to make effective professional decisions. This software-intensive course begins with useful descriptions of data and the probability theory foundation on which statistics rests. It continues to statistics, including the central limit theorem, which explains why data often appear to be normally distributed, and the Palm-Khintchine theorem which explains why data often appear to have a Poisson distribution. The remainder of the course focuses on regression and forecasting, including detecting and overcoming some of the deadly sins of regression, and the surprising flexibility of regression models. Recommended preparation: One semester of undergraduate calculus or consent of instructor. Offered as MSOR 433, OPRE 433 and MSBA 433. Prereq: For MSM Business Analytics and MSM Business Analytics Integrated students only.

MSBA 434. Data Mining & Visualization. 3 Units.
Data Mining is the process of identifying new patterns and insights in data. As the volume of data collected and stored in databases grows, there is a growing need to provide data summarization (e.g., through visualization), identify important patterns and trends, and act upon the findings. Insight derived from data mining can provide tremendous economic value, often crucial to businesses looking for competitive advantages. This course is a survey of data visualization methods, supervised and unsupervised learning techniques, and modern tools for discovering knowledge for business decisions. Prereq: For MSM Business Analytics and MSM Business Analytics Integrated students only.

MSBA 435. Marketing Models & Digital Analytics. 3 Units.
Models & analytics suitable for digital marketing data are the focus of this course. The objective to develop analytical skills for making intelligent decisions about marketing investments that create value and build competitive advantage. In short, to build capabilities for marketing analytics for insights. The course content and assignments are designed to (a) enable student learning by using real-world problems and data, (b) emphasize the Problem-Data-Analytics interdependence for effective problem solving, and (c) engage with thoughtful practitioners of digital data analytics to inform current practices and opportunities. Prereq: For MSM-Business Analytics students and MSM-Business Analytics Integrated students only.

MSBA 444. Predictive Modeling. 3 Units.
Predictive modeling is a set of procedures and tools for hypothesizing, testing and validating a model to explain and predict the probability or likelihood of a future event, or outcome. A wide range of procedures and tools are available for predictive modeling, and this course will cover a select set of topics with wide applicability. Through applications and case studies involving real-life data, the course will emphasize managerial problem solving. To build models is to capture managerial problem formulation, and to test/validate them is to confront managerial hypotheses with empirical observations. Problem solving is a creative act rooted in validated evidence of managerial hypotheses testing. Prereq: For MSM Business Analytics and MSM Business Analytics Integrated students only.
MSBA 445. Advanced Marketing Analytics. 3 Units.
In order to improve decision making in various decision areas of marketing like segmentation, positioning, advertising, promotions, new product development and pricing, use of quantitative data and analysis has become very popular. It is increasingly common for marketing managers to be challenged by top managers, to show the value of marketing expenditures to an organization’s financial well-being. This course will introduce a variety of data based decision-aids in the marketing area that will often focus on those metrics. In addition, the course will also introduce SAS to you. SAS is a very popular tool that analysts in business and economics field have been using for decades now, and has the potential to open some doors for you when it comes to internships and jobs. The course will also use R in parallel to re-emphasize what you have already learnt in previous classes. Prereq: For MSM-Business Analytics students and MSM-Business Analytics Integrated students only.

MSBA 446. Machine Learning and Artificial Intelligence in Business Analytics. 3 Units.
Advances in computational analytics including Machine, Deep and Statistical Learning (ML) provide powerful methods for developing mathematical “learning” models that can autonomously parse, learn from, and make predictions from data to improve performance with “experience”. In deep learning, large neural networks are leveraged to achieve artificial intelligence (AI), enabling machines to mimic human behavior. This course covers principles, algorithms, and applications of machine learning from a business analytics perspective. Specifically, the course will provide a practical understanding of modern machine learning techniques including regression and classification methods, resampling methods and model selection, regularization, perceptron and artificial neural networks, tree-based methods, support vector machines and kernel methods, and grouping methods. Prereq: MSBA 434 or MSBA 444.

MSBA 485B. Team Development. 1.5 Unit.
This course is unique in the sense that its primary focus is on the student working in teams. In this course the student will assess their team interaction based on team assignments simulated and action learning type projects, presenting to the class as a team, engaging in various experiential activities, participating one team coaching session, working with a team, and expanding their knowledge of team leadership and membership skills and abilities. They are also expected to engage with projects external to the university (similar to an action learning project). Offered as: MSOR 485B and MSBA 485B.

MSBA 499. Capstone Project in Business Analytics. 0 Unit.
This course is focused on engaging MSM in Business Analytics students in a capstone experience. Students will be provided with analytics problems with data from local companies and will be asked to leverage the broad range of skills, tools and approaches introduced throughout the program to analyze the data. They will also present a final report to the sponsoring organization. Prereq: For MSM-Business Analytics students and MSM-Business Analytics Integrated students only.