DEPARTMENT OF MIS, OPERATIONS & SUPPLY CHAIN MANAGEMENT AND BUSINESS ANALYTICS (MOA)

Mark Jacobs, Department Chairperson

- Master of Business Analytics (p. 1)
  - Certificate in Cyber-Security Managemen (p. 1)

Master of Business Analytics

The Master of Business Analytics is offered by the Department of MIS, Operations & Supply Management and Business Analytics. Business analytics deals with data-driven or evidence-based decision making in any business or non-profit organization. This program addresses an expanding need in many organizations for professionals trained in business data analytics with competencies in both (i) designing/managing data acquisition, storage, and display technologies and (ii) performing modeling and analysis yielding insights that lead to high levels of organizational effectiveness. The program focuses on the entire problem-solving process and on applied analytics skills for real world organizational issues and problems.

The program is open to students with a variety of undergraduate majors and experiences who have some quantitative aptitude and interests. Different elective tracks are offered depending on students' prior business education and/or experience. The program culminates with a capstone consulting project, which is a final, integrating experience to develop and enhance student capabilities in applying knowledge and skills to the real practice of business analytics. The program is offered online as well as on campus in a face-to-face format.

Analysis Methodologies

BAN 611	Statistical Analysis for Business Decisions	1.5
or MBA 511	Statistical Analysis for Business Decisions	
BAN 614	Introduction to Machine Learning	3
BAN 618	Advanced Business Analytics	3
BAN 791	Business Analytics	1.5
or MBA 791	Business Analytics	
MBA 615B	Case Studies in Analytics	1.5
Data Management		
BAN 663/ MBA 663A	Business Analytics - Processes and Techniques	1.5
MIS 664A	Data Management for Analytics	3
MIS 667A	Advanced Business Intelligence	3
MIS 668A	Special Topics in Data Analytics	3
Tools/Applications of Analytics		
MIS 661A	Problem Solving Methods and Tools	3
BAN 710	Capstone Project in Analytics	3
Electives [1]		6
BAN 613	Supply Chain Analytics	
or MBA 613	Supply Chain Analytics	
BAN 616	Project Management for Professionals	
or MBA 616	Project Management for Professionals	

MBA 500	Introduction to Financial Accounting	
MBA 501	Introduction to Managerial Accounting	
MBA 512	Principles of Operations Management	
MBA 520	Principles of Finance	
MBA 530	Principles of Marketing	
MBA 632	Marketing Analytics	
MBA 670	Principles of Organizational Behavior	
MIS 669	Special Topics in Management Information Systems	
OPS 619	Special Topics in Operations Management	
Total Hours		**33**

[1] Analytic Foundations track: Select from MBA 613, MBA 616, MBA 632, MIS 669, OPS 619

Business Foundations track: Select from MBA 500, MBA 501, MBA 512, MBA 520, MBA 530, MBA 570

Certificate in Cyber-Security Management (CSM)

The focus of the CSM coursework is on both management and technical aspects needed to secure computer information systems and networks. It also focuses on aspects of information warfare that may be relevant to Department of Defense and other government entities. The skill sets acquired in the program are also useful in private industry (in particular for those who work in defense and government-related industries as well as banks and credit unions).

MBA 662A	Security Management for Informational Systems	3
MBA 662B	Telecommunications and Networking	3
MBA 662C	Internet Security	3
Total Hours [1]		9

[1] Nine semester hours do not include any prerequisites that must be satisfied for specific courses. Prerequisites that do not count toward the credits for the Certificate Program have equivalent courses offered at the undergraduate level. Transfer hours may be used toward such prerequisites but not toward any of the nine credit hours required for the Certificate Program.

Business Analytics Courses

BAN 601. Business Principles for Analytics 1. 1.5 Hour
This introductory course, which is designed for MBAN students without a business degree, provides an overview of several business contexts / scenarios where analytics may be applied. Several functional areas of business are discussed and are drawn from Marketing, Finance, Management, Supply Chain Management, Information systems, and Accounting.

BAN 602. Business Principles for Analytics 2. 1.5 Hour
This introductory course, which is designed for MBAN students without a business degree, provides an overview of several business contexts / scenarios where analytics may be applied. The primary focus will be on the transformation function and highlight the integration with other business functions.

BAN 611. Statistical Analysis for Business Decisions. 1.5 Hour
This course is an introduction to descriptive and inferential statistics for MBA students. The overall purpose is for students to develop skills in (1) describing/summarizing sample data sets, (2) using probability distributions, (3) drawing conclusions about the properties of large groups when only sample information is available, and (4) investigating relationships among several properties based on a sample of those properties.

BAN 613. Supply Chain Analytics. 3 Hours
Overview of decision making in supply chain management. Problem solving steps and algorithms. Introduction to specialized data analytics software. Emphasis on predictive analytics. Prerequisites: BAN 611 or approval of department chair.

BAN 614. Introduction to Machine Learning. 3 Hours
Topics include programming in R, data manipulation and exploratory data visualization; predictive modeling using regression, decision trees, naive bayes, discriminant analysis; regularization and resampling methods; clustering and principal component analysis. Prerequisites: MBA 511 or MBA 611 or BAN 611; MIS 661A.

BAN 615. Case Studies in Analytics. 1.5 Hour
Selected cases illustrating the use of various analytics methods in descriptive, predictive, and prescriptive analytics to solve specific business problems. Prerequisites: BAN 791 or MBA 791.

BAN 616. Project Management for Professionals. 3 Hours
Project-oriented work makes up the bulk of managerial activity in organizations and consequently knowledge of project management principles is valued highly. This course offers a broad review of issues and approaches to contemporary professional project management useful for any MBA student and future manager. Prerequisites: BAN 611 or permission of instructor.

BAN 618. Advanced Business Analytics. 3 Hours
Techniques for the solution and analysis of various business problems. Types of models: linear programming, integer linear programming, network models, utility theory with risk attitude, dynamic programing, Monte Carlo simulation, and decision tree. Problem-oriented case studies. Emphasis on business insights, implications, and on analysis of the solution procedures. Use of modeling languages, such as Python, and commercial solvers. Prerequisite(s): MBA 791 or BAN 791, MIS 661A.

BAN 661A. Problem Solving Methods and Tools. 3 Hours
Overview of organizational decision making. Problem solving steps and algorithms. Introduction to programming. Introduction to specialized software for data analytics.

BAN 663. Business Analytics - Processes and Techniques. 1.5 Hour
Survey of the main phases of the life-cycle of analytics, including information requirements determination, data acquisition, analysis with descriptive, predictive, and prescriptive models, visualization, analysis presentation, and delivery. Hands-on practice with creating visualization and dashboards and with using data mining tools to analyze data. Prerequisites: BAN 611 or MBA 511 or MBA 611.

BAN 664A. Data Management for Analytics. 3 Hours
Phases in creating relational databases systems for collecting, storing, and extracting data for business analysis including use of the Structured Query Language (SQL). Data quality issues. Steps in creating and operating a data warehouse, including multi-dimensional modeling, extracting, transforming, and loading data for business analysis. Prerequisites: BAN 661A.

BAN 667A. Advanced Business Intelligence. 3 Hours
The role of business intelligence in setting and achieving organizational goals. How business intelligence supports different types of organizational decisions making. Tools and analytical methods for acquiring business intelligence, including statistical methods, data mining, visualizations, and programming for analytics. Methods and organizational structures for implementing business intelligence in own organization, including maturity assessments, roadmaps, and business intelligence excellence centers. Prerequisites: MIS 661 or BAN 661. Corequisites: MBA 663A or BAN 663.

BAN 668A. Special Topics in Data Analytics. 3 Hours
Selected advanced business intelligence and data analytics topics, e.g., big data, social network analysis, web (social media) analytics, text analytics, text scraping and others, as applied to business scenarios. Seminar-based or survey-based course. Project intensive. Prerequisites: MIS 661A or BAN 661A, MIS 664A or BAN 664A and MIS 667A or BAN 667A.

BAN 710. Capstone Project in Analytics. 3 Hours
Application of business analytics knowledge and skills with real-world projects or actual firms, student teams, project planning and implementation, presenting a management-style report of results and benefits. Prerequisites: BAN 614, BAN 618, MIS 667A, BAN 615 or MBA 615B.

BAN 791. Business Analytics. 1.5 Hour
The role of Business Analytics in providing support for business decisions, particularly an overall framework for analyses involving mathematical models. Emphasis on optimization and descriptive modeling utilizing analysis techniques such as linear programming, integer and binary programming, and simulation modeling. Focus on the application of such techniques to business decisions with cases. Use of spreadsheets (e.g., Excel) to implement analytic models. Prerequisites: MBA 511 or MBA 611 or BAN 611.

Decision Sciences Courses

Management Info Systems Courses

MIS 616. Project Management for Professionals. 3 Hours
Project-oriented work makes up the bulk of managerial activity in organizations and consequently knowledge of project management principles is valued highly. This course offers a broad review of issues and approaches to contemporary professional project management useful for any MBA student and future manager. Graduate Standing.

MIS 622A. Security Management for Informational Systems. 3 Hours
Addresses issues relevant to creating and managing a systematic security process in organizations. Information security policy, assets, physical and logical information resource security, business continuity, and compliance with relevant security standards are covered. Prerequisites: MBA 560 or MBA 660.

MIS 661A. Problem Solving Methods and Tools. 3 Hours
Overview of organizational decision making. Problem solving steps and algorithms. Introduction to programming. Introduction to specialized software for data analytics.

MIS 662A. Security Management for Informational Systems. 3 Hours
Addresses issues relevant to creating and managing a systematic security process in organizations. Information security policy, assets, physical and logical information resource security, business continuity, and compliance with relevant security standards are covered. Prerequisites: MBA 560 or MBA 660.

MIS 662B. Telecommunications and Networking. 3 Hours
Introduction to management of computer-based communication networks. Includes underlying concepts, basic hardware components and operating systems, network architectures and protocols, data integrity and security, message routing, network resource management. Prerequisites: MBA 560 or MBA 660.

MIS 662C. Internet Security. 3 Hours
Provides managers with an understanding of both defensive and offensive issues surrounding the security of computer-based information networks. The course includes instruction on theory about information security, psychological operations, hacking, viruses, network systems management, and security for e-commerce. Prerequisite(s): MBA 662B.

MIS 663A. Business Analytics - Processes and Techniques. 1.5 Hour
Survey of the main phases of the life-cycle of analytics, including information requirements determination, data acquisition, analysis with descriptive, predictive, and prescriptive models, visualization, analysis presentation, and delivery. Hands-on practice with creating visualization and dashboards and with using data mining tools to analyze data. Prerequisites: BAN 611 or MBA 511 or MBA 611.

MIS 664. Database Management. 3 Hours
Introduction to databases and their management. File organization and data structures; database management systems; major data models; conceptual, logical, and physical database design; data definition and manipulation with SQL; data administration; and client/server and distributed databases. SQL-based software tool for database project. Prerequisites: MBA 560 or MBA 660.

MIS 664A. Data Management for Analytics. 3 Hours
Phases in creating relational databases systems for collecting, storing, and extracting data for business analysis including use of the Structured Query Language (SQL). Data quality issues. Steps in creating and operating a data warehouse, including multi-dimensional modeling, extracting, transforming, and loading data for business analysis. Prerequisites: MIS 661A.

MIS 665. System Analysis & Design. 3 Hours
Introduction to object-oriented concepts and techniques for analyzing and designing systems. Activities performed and models created during the different phases of the development life cycle. Systems development project using a CASE tool. Prerequisites: MBA 560 or MBA 660.

MIS 667A. Advanced Business Intelligence. 3 Hours
Supporting business intelligence for organizational decision making through building visualizations and interactive dashboards. Tools and analytical methods for acquiring data, preparing and organizing data, identifying key performance indicators, crafting visualizations, and building interactive dashboards using Python-based tools and libraries. Prerequisites: MBA 663A or BAN 663 or MIS 663A (may be taken as a co-requisite); MIS 661A.

MIS 667B. Data Warehousing. 3 Hours
Emphasizes the purpose, design, implementation, and effective use of data warehouses and data warehousing technologies. Various schemas for the design of a data warehouse, modeling time in a data warehouse, data quality management for building a data warehouse from operational data stores and legacy applications, and technologies to populate and retrieve information from data warehouses will be covered. Related topics of data marts, analytical processing, data mining, and active data warehousing will also be addressed. MBA 664 is required unless student has database management coursework or relevant database management experience. Prerequisites: MBA 560 or MBA 660; MBA 664.

MIS 668. Advanced Website Development. 3 Hours
Covers issues involved in developing websites for business usage. Issues covered or investigated include: site layout, implementation and management, good site design practices, connecting websites to company data, and processing secure transactions across the Web. HTML and a high-level programming language required or permission of instructor.

MIS 668A. Special Topics in Data Analytics. 3 Hours
Selected advanced business intelligence and data analytics topics, e.g., big data, social network analysis, web (social media) analytics, text analytics, text scraping and others, as applied to business scenarios. Seminar-based or survey-based course. Project intensive. Prerequisites: BAN 614 (may be taken concurrently).

MIS 669. Special Topics in Management Information Systems. 1-3 Hours
Advanced and current topics in management information systems. Topics vary. Prerequisite(s): Permission of instructor.

Operations Management Courses

OPS 615. Analytics: Processes and Applications. 3 Hours
Main phases of the life-cycle of analytics, including information requirements determination, data acquisition, analysis with descriptive, predictive, and prescriptive models, visualization, analysis presentation, and delivery. Selected cases illustration use of various analytics methods to solve specific business problems. Prerequisite(s): MBA 791.

OPS 616. Project Management for Professionals. 3 Hours
Project-oriented work makes up the bulk of managerial activity in organizations and consequently knowledge of project management principles is valued highly. This course offers a broad review of issues and approaches to contemporary professional project management useful for any MBA student and future manager. Graduate Standing.

OPS 617. Business Process Improvements. 3 Hours
Study of the concepts and techniques of business process analysis and improvements as building blocks for all operations improvement strategies, using a range of tools from simple process-mapping to computer-based process-modeling. Balancing technical/analytical and organizational/behavioral aspects of business process improvements are highlighted. The class will include a business process analysis/improvement project using a process modeling software. Prerequisites: (MBA 511 or MBA 611); (MBA 512 or MBA 612).

OPS 619. Special Topics in Operations Management. 1.5,3 Hours
Advanced or special topics in the analysis, design, operation, and maintenance of manufacturing and service systems. Topics vary. Prerequisite(s): Permission of instructor.