MASTER OF SCIENCE IN BUSINESS ANALYTICS

The MSBA program includes 33 credits and is full-time and in-person. The program runs over the fall, spring, and summer sessions. The students complete eight required Business Analytics courses and choose a three-course specialization (Fintech, International Business, and Global Supply Chain Management). Students may also choose a generalist track (no specialization) that tailors electives to their personal and professional needs. Applicants who do not have the prerequisites for the MSBA program, depending on their background, will be required to take specific bridge courses during the summer before the full-time program begins.

Modern businesses rely on all kinds of data to make decisions and measure performance. Our Master of Science in Business Analytics (MSBA) program builds Bryant's expertise in business education and trains future business leaders on state-of-the-art business analytics tools and techniques. Students learn the whole process of data analytic life cycle from data gathering, preparation, data exploration, model building, and data visualization/communication. Students learn to use advanced analytics to support organizational goals and strategies and use analytics to tell compelling stories that impact business strategy. The program culminates with a capstone project where students apply what they have learned during the program to a project provided by our corporate partners and present their findings to the partners.

Upon graduation, students will be proficient programmers in Python, R, SQL/NoSQL, and data visualization software (Tableau/PowerBI). They will gain a deep understanding of predictive analytics, prescriptive analytics, machine learning, and marketing analytics. They will learn storytelling and communicating insights for different audiences using visual, oral and verbal methods. Additionally, they will have experience with an evolving array of cutting-edge big data management and cloud analysis tools like Microsoft Azure, Amazon Web Services, and Databricks.

Master of Science in Business Analytics Degree Requirements:

Required Introduction Course:

MSBA 515	Preparing for MSBA Success	0

Business Analytics Foundation Required Courses:

ISA 510	Probability and Statistics for Data Analytics	3
ISA 520	Data Visualization and Communication	3
ISA 530	Fundamentals of Machine Learning	3
ISA 540	Large Scale Data Management and Data Ethics	3

Business Analytics Required Courses:

MSBA 610	Time Series Analysis and Optimization for Business Decisions	3
MSBA 620	Marketing Analytics	3
MSBA 630	Business Strategy and Analysis	3
MSBA 640	Business Analytics Capstone	3

Please pick 3 Elective Courses from the approved listing below:

FIN 501	Programming in Finance	3
FIN 502	Fintech and Blockchain for Finance	3
FIN 503	Fintech and Digital Innovation Fund	3
GSCM 601	Corporate Social Responsibility in Global Supply Chain Management	3
GSCM 603	Advanced Supply Chain Integration	3
GSCM 604	Logistics of International Trade	3
HS 501	Introduction to Healthcare Informatics	3
HS 510	Population Health	3
HS 530	Healthcare Operations and Systems	3
HS 610	Electronic Health Records	3
HS 630	Health Analytics (R, Python, Tableau)	3
HS 640	Project Management	3
IB 601	International Business Management	3
IB 602	Global Human Resource Management	3
IB 603	International Marketing	3
MBA 520	Managing Corporate Enterprise	3
MBA 521	Leading Effective Organizations	3
MBA 522	Reporting and Controlling Resources	3
MBA 523	Managing Information Resources	3
MBA 524	Managing Financial Resources	3
MBA 525	Marketing for Competitive Advantage	3
MBA 526	Value Formation Through Operations	3
	May opt to take a direct study, co-ops, or special topics in Business Analytics with program director approval	

A minimum of 33 credit hours is required for graduation. Introduction course is also required.

Global Finance Courses

GFIN 601. Global Financial Management. 3 Credit Hours.
This course deals with the theories and principles of global management. It develops a framework for evaluating the opportunities, costs, and risks of operating in the global markets for goods, services, and financial assets. Topics include the rationale for hedging currency risk, treasury management of international transactions, managing transaction exposure to currency risk, managing operating exposure to currency risk, foreign market entry and country risk management, multinational capital budgeting, multinational capital structure and cost of capital, and corporate governance. Students will explore global financial management by analyzing case studies and preparing a country analysis report for market entry.

GFIN 691. Directed Independent Study in Global Finance. 3 Credit Hours.
This course is designed to allow an individual academic program to be tailored to fit the unique interests of a graduate student. At the initiation of the graduate student, the faculty member and the student will develop an academic plan that is submitted to the College of Business for final approval.

Global Supply Chain Management Courses

GSCM 601. Corporate Social Responsibility in Global Supply Chain Management. 3 Credit Hours.
This course will focus on the strategic impact of corporate social responsibility on the global supply chain. The goals of this course are to provide students with an in-depth knowledge of the various types of supply chain events that are connected to corporate social responsibility and the strategic best practices to mitigate these events. Lectures will provide a theoretical basis and illustrate the practical application of concepts. Cases, articles from academic journals, short videos, assignments, and one exam will be utilized to reinforce the subject matter and provide a variety of learning modes.

GSCM 603. Advanced Supply Chain Integration. 3 Credit Hours.
A key challenge to successful supply chain management is coordination of activities across the supply chain. This course will provide strategies for supply chain design by identifying the appropriate level of integration and coordination to improve the long-term performance of the individual companies and the supply chain as a whole. Topics include demand forecasting, integrated business management (sales and operations planning), demand management and CPFR, demand planning, and relationship management. Hands-on learning will take place within a global supply chain management simulation.

GSCM 604. Logistics of International Trade. 3 Credit Hours.
This course provides basic preparation in transportation economics and management as well as international transport and logistics. This course provides basic knowledge of import and export requirements for making contracts, payments, insurance, managing risk, arranging transportation, dealing with customs, and international trade law and theory. The course is taught in two modules: International Transport and Logistics, and Logistics Analysis. Attention is given to how transportation pricing and tradeoffs work, shipper and carrier strategies, and logistics processes for moving goods and people internationally. Students will quantitatively develop and assess strategies for transportation and network planning, inventory decision making, facility location planning, and vehicle routing. The course objectives are based on a partial list of the exam requirements for the Certification in Transportation and Logistics (CTL) professional credential offered by America's oldest logistics profession organization, The American Society of Transportation and Logistics (AST&L).
Prerequisites: MBA526.

GSCM 691. Directed Independent Study in Global Supply Chain Management. 3 Credit Hours.
The course is designed to allow an individual academic program to be tailored to fit the unique interests of a graduate student. At the initiation of the graduate studies, the faculty member and student will develop an academic plan that is submitted to the director of the College of Busines for final approval.

Information Syst. Analytics Courses

ISA 510. Probability and Statistics for Data Analytics. 3 Credit Hours.
Probability and statistics are at the foundation of data science and artificial intelligence. The objective of this course is to provide students with an understanding of how to analyze and understand data through statistics and probability. As such, this course provides an overview of more foundational probability and statistics topics, before delving into more advanced topics through projects. Students will work with data in Python Notebooks to demonstrate their analytical skills.
Session Cycle: Fall
Yearly Cycle: Annual.

ISA 520. Data Visualization and Communication. 3 Credit Hours.
This course examines the art and science of data visualization. It teaches how to visually explore data and how to criticize, design, and implement data visualizations. It teaches the fundamentals of human perception and data visualization, exploratory data analysis and the importance of interaction in exploration, techniques for data visualization of specific data sets (networks, temporal data, geographic data, business data, etc..), and storytelling. The course will enable students to describe a visualization problem, to explore the data using visualizations, to discuss and design appropriate visualization concepts, and to implement and critically reflect on them. We will learn multiple popular data visualization tools such as Power BI, Tableau, and Python to implement our data visualization projects throughout the course.
Session Cycle: Fall
Yearly Cycle: Annual.

ISA 530. Fundamentals of Machine Learning. 3 Credit Hours.
This is a fundamental machine learning course requiring background knowledge including probability theory, linear algebra, calculus as well as good programming skills. The programming environment used in the lecture examples, assignments, and projects will be using the following tools including Python/Pytorch/Keras. The course will cover many of the most important mathematical foundations and computational tools of modern machine learning as well as advanced methods and frameworks used in modern machine learning. We will examine specific models from the literature and examine how they can be used for modeling particular types of data. This course treats both the art of designing efficient machine learning algorithms as well as the science of analyzing and evaluating the properties and computation efficiency of algorithms. This course will help students to select and potentially develop appropriate methods and approaches to problems in real applications.
Session Cycle: Fall
Yearly Cycle: Annual.

ISA 540. Large Scale Data Management and Data Ethics. 3 Credit Hours.
This course introduces data preparation and data management with a focus on applications in large-scale analytics projects utilizing relational, document, and graph database systems. Students learn about the relational model, the normalization process, and structured query language. They learn about data cleaning and integration, and database programming for extract, transform and load operations. Students work with unstructured data, indexing and scoring documents for effective and relevant responses to user queries. They learn to load, store and process big data in a cloud environment. In addition, they explore the social and ethical dimensions of data science and critically evaluate all stages of the data lifecycle from data collection and storage to data analysis and use.
Session Cycle: Fall
Yearly Cycle: Annual.

ISA 691. Directed Independent Study. 3 Credit Hours.
Students interested in exploring an idea, contributing to research, or developing a project may do so under the guidance of an affiliated faculty member in the Data Science/Business Analytics program. At the initiation of the graduate student, the faculty member and the student will develop an academic plan that is submitted to the Chair of the ISA department for approval.

ISA 692. Data Science/Business Analytics Internship. 3 Credit Hours.
ISA internships give students the opportunity for supervised employment in an area where they can apply the Data Science and/or Business Analytics skills they have studied through our curriculum. Interns work at least ten hours per week, meet periodically with a supervising faculty member, and prepare a substantive report on their work experience. Prerequisites: ISA 510, ISA 520, ISA 530, and ISA 540.

Master of Sci Bus Analytics Courses

MSBA 515. Preparing for MSBA Success. 0 Credit Hours.
This course is designed to provide entering MSBA students with the skills necessary to be successful in a graduate data science program. Students will garner an understanding of the use of the critical expectations of a graduate level program.

MSBA 610. Times Ser. Analy Opt Bus Dec. 3 Credit Hours.
In this course, students will become familiar with modern data analytics methods to understand, analyze, and suggest solutions to business problems. Specifically, this course will provide an overview of time series, forecasting, and optimization techniques. This course will introduce students to a general class of models that can be used to represent time series data and investigate common time series modeling and forecasting methodologies. In addition, students will be introduced to optimization techniques including linear and non-linear programming methods. The course will equip students with a sound foundation in model building for a variety of business decision-making applications. In particular, this hands-on-the-data course offers an introduction to quantitative methods and prepares students to turn real-world problems into mathematical models. The application areas are diverse and originate from problems in finance, government, marketing, transportation, management, accounting, human resources, and healthcare.
Session Cycle: Summer Term 1
Yearly Cycle: Yearly.

MSBA 620. Marketing Analytics. 3 Credit Hours.
This course will provide students with an introduction to marketing analytics. Students will study various tools for generating marketing insights from empirical data in such areas as segmentation, targeting and positioning, satisfaction management, customer lifetime analysis, customer choice, and product and price decisions using conjoint analysis. Students will apply the tools such as Excel, R, and Tableau studied to actual marketing business situations. Students will have hands-on experience of data analysis.
Prerequisites: ISA 510
Session Cycle: Spring
Yearly Cycle: Yearly.

MSBA 630. Business Strategy and Analysis. 3 Credit Hours.
This course explores the role of analytics and business intelligence in an organization's evaluation of the strategic environment, the application of strategic frameworks to formulate a strategy, and the implementation of that strategy. The course will give students a thorough understanding of the interplay between analytics and strategic considerations in an organization. More specifically, students will learn the practical application of analytics to formulate an organization's strategy and reversely the influence of the organization's strategy to the nature of the analytics within the organization.

MSBA 640. Business Analytics Capstone. 3 Credit Hours.
The Analytics Capstone course provides students with the opportunity to apply the knowledge and skills that they have acquired to realistic problems that involve large data sets. The course will revolve around a project based on a data set from a business partner of Bryant University that will provide real data and define a typical decision set that can be solved using the data. Students will present the results of their analysis and recommendations to other students in the class and if appropriate to the client. Students are expected to create a professional presentation of their work and to deliver it confidently. The project will consist of multiple predictive models to assist the client that will be developed using Python. Multiple predictive modeling techniques learned in prior classes will be used. The class will review those techniques prior to beginning model development.
Prerequisites: ISA 510, ISA 520, ISA 530, and ISA 540
Session Cycle: Summer Term 2
Yearly Cycle: Yearly.