BUSINESS ANALYTICS (MSBA)

Subject-area course lists indicate courses currently active for offering at the University of Louisville. Not all courses are scheduled in any given academic term. For class offerings in a specific semester, refer to the Schedule of Classes (https://csprd.louisville.edu/psp/ps_class/EMPLOYEE/PSFT_CS/c/COMMUNITY_ACCESS.CLASS_SEARCH./x/?state=62dab551a0d600a5e8237359c50704e59007&duo_code=sjUx2OSTj21bWVEuQ371YBiHmfxngoV)

500-level courses generally are included in both the undergraduate- and graduate-level course listings; however, specific course/section offerings may vary between semesters. Students are responsible for ensuring that they enroll in courses that are applicable to their particular academic programs.

Course Fees

Some courses may carry fees beyond the standard tuition costs to cover additional support or materials. Program-, subject- and course-specific fee information can be found on the Office of the Bursar website (https://louisville.edu/bursar/tuitionfee/university-fees/).

MSBA 600. Master of Science in Business Analytics   **0 Units**
Description: Master of Science in Business Analytics - billing course
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

MSBA 605. Python for Analytics   **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): Admission to MSBA degree program.
Description: This course introduces essential general programming concepts and techniques to a data analytics audience with no prior programming experience. Students will learn the aspects of programming that can support business analytics with hands on programming including accessing data, creating informative data graphics, writing functions, debugging, and organizing code. Examples are drawn from the problems and programming patterns often encountered in data analysis. It will use a common analytics programming language such as Python.
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MSBA 610. Data Visualization with Power BI   **1.5 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): Admission to MSBA degree program.
Description: Students will become well versed in ingesting data sources and selecting the appropriate visualization to unearth the underlying story within large data sets. Students will be utilizing Data Analysis Expressions, DAX, to create various formulas to help in analyzing multiple data sources. By the end of the class, students will build a PowerBI model to be presented to the class in a professional scenario.
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MSBA 615. R for Analytics   **1.5 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): Admission to MSBA degree program.
Description: This course provides an intensive, hands-on introduction to the R programming language. The student will learn the fundamental skills required to acquire, mange, transform, manipulate, and visualize data in a computing environment that fosters reproducibility.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

MSBA 620. Statistical Foundations of Business Analytics   **3 Units**
Term Typically Offered: Fall, Spring
Description: This course provides comprehensive understanding of analytical fundamentals. Students will learn business problems, the types of data required to address problems, and solution estimation. Students will learn how to setup and test the efficacy of a business strategy by setting up experiments, analyzing data, and making business decisions. The course will provide a basic understanding of some advanced analytical techniques.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

MSBA 625. Storytelling with Data   **1.5 Units**
Term Typically Offered: Fall Only
Prerequisite(s): Admission to MSBA degree program.
Description: This course is a data visualization and business presentations course specifically designed for professionals in the field of business analytics. Throughout the semester, you will develop your ability to organize, visualize, and present data driven messages that are professional, clear, concise, and persuasive. By the end of the course, you will enhance your ability to communicate with and about data in multiple business and professional contexts: formal individual presentations, team-based presentations, and informal one-on-one and small group interactions.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

MSBA 630. Modern Data Management   **3 Units**
Term Typically Offered: Fall, Spring
Prerequisite(s): Admission to MSBA degree program.
Description: This course provides an introduction to issues, principles, and technologies of modeling and using organizational data. It covers concepts and skills for developing, accessing, and administering relational databases, and formulating and executing complex queries. It also discusses the role of data management technologies and practices in an organizational setting and how such technologies and practices may impact business strategy, business processes, and organizational structure. This course has a strong hands-on component. The course will make extensive use of a leading relational database management software and structured query language (SQL).
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MSBA 635. Predictive Analytics   **3 Units**
Term Typically Offered: Fall, Spring
Description: This course builds on the MSBA 620 course by introducing more advanced topics in analytics. This course challenges and teaches students how to use powerful statistical tools (e.g., SmartPLS, SAS, and SPAA) to handle data that come in a variety of forms and sizes in more complex, less structured business situations. Students will participate in extensive hands-on work solving realistic business problems. This course may guide students with handling advanced regression analysis that deals with real-life models and interaction variables, time series analysis, and topics such as PLS path modeling. After taking this course, students should: 1) Approach business problems data analytically; 2) think systematically whether and how data can help make better informed decisions; 3) be able to interact competently with business analytical tools; and 4) have had hands-on experience mining data.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

MSBA 640. Decision Models   **3 Units**
Term Typically Offered: Spring Only
Description: This course trains students to turn real-world problems into mathematical and spreadsheet models and to use such models to make better managerial decisions. This is a hands-on course that focuses on modeling business problems, turning them into spreadsheet models and using tools like Solver to obtain solutions to these managerial problems. The course focuses on two classes of models, optimization and simulation. The application areas are diverse and they originate from problems in finance, marketing and operations. We cover problems such as how to optimize a supply chain and how to price products when faced with demand uncertainty. Topics covered include linear and linear integer programming, nonlinear programming and evolutionary solver, simulation and optimization, multi-period linear programming and Monte Carlo simulation.
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MSBA 645. Applied Machine Learning   **3 Units**
Term Typically Offered: Fall, Spring
Description: Data mining draws on statistics, artificial intelligence and machine learning to discover novel, interesting and actionable relationships and patterns in large and complex data sets. This course will introduce the student to the fundamentals of data mining, including methodology, data preparation, commonly used predictive models, supervised and unsupervised learning, model comparison and evaluation, and mining of unstructured data such as text. While the emphasis is on solving realistic business problems, the course will also provide a brief background for the various models and techniques introduced in the course. The course follows a learn-by-doing approach in which the students will complete assignments using real world data sets. A leading data-mining tool such as SAS Enterprise Miner will be used extensively in this course.
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MSBA 650. Advanced Analytical Tools   **3 Units**
Term Typically Offered: Fall, Spring
Description: The course presents advance business analytics using R. The concepts learned in this class should help you identify opportunities in which business analytics can be used to improve performance and support important decisions. It will teach you important tools that can be used to transform data into high-impact business decisions. Lastly, it should make you alert to the ways that analytics can be used, and misused, within an organization.
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MSBA 655. Special Topics: Marketing Analytics   **1.5 Units**
Term Typically Offered: Spring Only
Description: The use and analysis of data to guide marketing decisions is the focus of this course. The course will focus marketing metrics, their estimation, and use.
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MSBA 680. Special Topics in Business Analytics   **1.5-3 Units**
Term Typically Offered: Occasionally Offered
Prerequisite(s): Admitted to MSBA & achieved elective status.
Description: An advanced study of one or more selected topics or issues related to the study of business. Topics or issues could be from a single business discipline such as management or from a combination of business disciplines, such as accountancy and finance.
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MSBA 685. Analytics Internship   **1 Unit**
Term Typically Offered: Spring Only
Description: The academic objective of the internship program in the Master of Science in Business Analytics program is to provide enrolled students with an opportunity for hands-on business experience where they can apply classroom knowledge in a real-world setting and bring the experiences gained during their internship employment into the classroom. The internship is expected to nominally last for 11 months.
Course Attribute(s): CBL - This course includes Community-Based Learning (CBL). Students will engage in a community experience or project with an external partner in order to enhance understanding and application of academic content.

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MSBA 690. Analytics Capstone **3 Units**
Term Typically Offered: Spring Only
Description: Each student assists (as a team member) an organization in the Louisville area to improve some aspects of its business analytics operations. The students develop project in conjunction with key business executive and work to investigate and then create recommended courses of action.
Course Attribute(s): CBL - This course includes Community-Based Learning (CBL). Students will engage in a community experience or project with an external partner in order to enhance understanding and application of academic content.

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MSBA 691. Deep Learning **1.5 Units**
Term Typically Offered: Fall, Spring
Description: Deep learning is a branch of machine learning and AI which uses artificial neural networks to solve complex problems. Deep learning models have already become the state of the art in most text, sound, and computer vision problems. Self-driving cars, expert Go player, and even AI generated art and music are thanks to deep neural networks. These models can be supervised (predicting a labeled target), unsupervised (learning a pattern or structure), or semi-supervised (learning from labeled and unlabeled data) and often requires less pre-processing and feature engineering on the data than other machine learning models. In this class we will start by building neural networks (using Python) against well-known datasets, then we will look at a variety of specialized structures of neural networks that are suitable for different domains. Following that, we will download and use pre-trained models and apply them to our own data sets.
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MSBA 692. Pipelines to Insights **1.5 Units**
Term Typically Offered: Fall, Spring
Description: This module is project-based and designed to provide the students with applied knowledge of pipeline design in an agile context by fully immersing them in agile ceremonies in a business setting. This class will expose the students to aspects of research, design, data discovery and data extraction, transformation, and landing concepts. Using web-based data sources, the students will gain a combination of hands-on knowledge of the data pipeline process, including real world challenges with designing pipelines for machine learning algorithms. The intent of this practical approach is to help students generate portfolio pieces to show potential employers and help students understand their current strength and weaknesses with machine learning pipelines.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

MSBA 693. Advanced Analytics using PySpark **1.5 Units**
Term Typically Offered: Fall, Spring
Description: Most organizations use analytics to efficiently provide a better quality experience for their customers. This course challenges students to understand various analytical strategies by participating in extensive hands-on work solving realistic industry problems. Upon completion of this course, students should be able to: 1) understand basic concepts and terminology about Machine Learning ; 2) apply unsupervised learning concepts like clustering and association rules, and supervised learning concepts like regression, decision trees, random forests, gradient boosting for problem solving; 3) identify relevant metrics to choose the best analytics model, and also be able to explain individual member level predictions using SHAP; and 4) communicate your complex analyses and insights to non-technical audience.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

MSBA 694. Natural Language Processing **1.5 Units**
Term Typically Offered: Fall, Spring
Description: In today's data-driven world, understanding the nuances of text data is becoming increasingly critical for decision-making processes in business. This course aims to provide MSBA students with a comprehensive introduction to Natural Language Processing (NLP) and its applications in business analytics. Through a blend of theoretical and hands-on approaches, students will gain insights into how NLP can solve various challenges in business, such as text mining, sentiment analysis, predictive modeling, chatbot development, and more.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

MSBA 695. Cloud Computing **1.5 Units**
Term Typically Offered: Fall, Spring
Description: [3:20 PM] Young, Krista This course explores the knowledge and technical aspects of cloud computing solutions across various industry domains. Students will explore the impact of cloud computing in the world today, identify key cloud industries and identify common patterns, and explore the technical aspects of cloud solutions. Students will build cognitive solutions, leveraging AI and data science in cloud solutions in addition to prototyping cloud solution leveraging industry-proven concepts, technologies, and methodologies such as IBM Cloud Garage.
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