MASTER OF SCIENCE (M.S.) IN DATA ANALYTICS

College: College of Science and Health
Department: Mathematical and Computational Sciences
Student Type: Graduate Semester
Degree: Master of Science (M.S.)
Campus: Lisle Campus

Overview

The Master of Science in Data Analytics program at Benedictine University is designed to prepare students for careers in the rapidly growing field of data analytics. Through an industry-aligned curriculum, students will develop the technical and analytical skills necessary to process and analyze complex, large-scale data, build predictive models, and enhance decision-making across various industries.

The program is ideal for students from diverse academic backgrounds who seek to gain expertise in data analytics methodologies and applications. Graduates will be well-positioned for roles such as data scientist, machine learning engineer, data architect, data analyst, and business intelligence analyst.

Learning Goals for the M.S in Data Analytics Program

Graduates of the M.S. in Data Analytics program will:

- Develop advanced programming skills in languages such as Python and R.
- Apply mathematical and statistical techniques fundamental to data analytics.
- Analyze and visualize complex data sets effectively.
- Implement machine learning and data mining techniques in real-world scenarios.
- Design and execute large-scale data analytics projects and communicate findings clearly to diverse audiences.

Program Structure

The M.S. in Data Analytics program requires the successful completion of 33 semester credit hours, structured as follows:

- 3 credit hours of introductory courses (may be waived based on prior coursework).
- 21 credit hours of core courses covering essential data analytics concepts and techniques.
- 9 credit hours of elective courses in Business Applications.

ADMISSION REQUIREMENTS

Admissions Requirements:

To apply for the M.S. in Data Analytics program, students must submit:

- A graduate admission application and a $40 non-refundable application fee.
- Official transcripts from all previously attended universities/colleges.
- Students wishing to have DASC 5100 waived (likely Mathematics, Computer Science or Data Science undergraduate majors) should email transcripts to the Program Director for approval.

DEGREE REQUIREMENTS

Curriculum:

Code	Title	Hours
Introductory Courses (3 semester credit hours)		
(May be waived if equivalent undergraduate coursework has been completed.)		
DASC 5100	Programming Fundamentals	3
Core Courses (21 semester credit hours)		
DASC 5150	Ethics for Data Analytics	3
DASC 5200	Mathematics for Data Science	3
DASC 5300	Advanced Programming	3
DASC 5320	Data Analysis & Visualization	3
DASC 5383	Machine Learning	3
DASC 5400	Data Simulation, Bayesian Modeling, and Inference	0
DASC 6398	Capstone Project	3
Elective Courses (9 semester credit hours-choose from the following courses)		9
BALT 6102	Business Analytics I: Predictive Analytics	
BALT 6103	Business Analytics II: Prescriptive Analytics	
BALT 6201	Databases and Data Warehousing	
MNGT 6501	Operations Management	
MNGT 6701	Business Intelligence	
Total Hours		**30**

COURSES

DASC 5100 Programming Fundamentals. Introduction to foundational programming concepts. The course is specifically designed for students without prior programming experience. Topics include syntax, conditionals, loops, functions, lists, strings and dictionaries. Data structures such as trees and heaps are also discussed. 3 semester credit hour/s.
Campus: LISLE (Typically Offered: Fall Term)

DASC 5150 Ethics for Data Analytics. Ethical concepts and dilemmas within the field will be covered. Topics will include the ethical discussion about data science starting with proper data collection, then proper data analysis and finally safe and secure data storage. This course will prepare students to handle real world ethical issues within the field of data analytics and data science and their future projects. 3 semester credit hour/s.
Campus: LISLE (Typically Offered: Summer Term)

DASC 5200 Mathematics for Data Science. Mathematics from multiple disciplines, including probability, statistics, calculus, discrete mathematics and linear algebra, needed for understanding a variety of mathematical models used in data science. 3 semester credit hour/s.
Campus: LISLE (Typically Offered: Fall Term)

DASC 5300 Advanced Programming. Advanced programming concepts with specific emphasis on language features commonly utilized in data analytics. Relevant Python libraries for data analytics are also explored in depth, including NumPy, pandas and scikit-learn. Along with a brief introduction to R. Prerequisite: DASC 5100 3 semester credit hour/s.
Campus: LISLE (Typically Offered: Fall Term)

DASC 5320 Data Analysis & Visualization. Practical applications of data science in various industries are explored as well as ethical issues involved in data acquisition and analysis. Topics include data preparation techniques, data exploration methods, dimensional reduction techniques and data visualization approaches. Prerequisite: DASC 5300. 3 semester credit hour/s.
Campus: LISLE (Typically Offered: Fall Term)

DASC 5383 Machine Learning. Investigation of the design, implementation and application of various supervised machine learning algorithms. Techniques in data representation, model evaluation and model improvement are also considered. Prerequisite: DASC 5300 or CMSC 3270. 3 semester credit hour/s.
Campus: LISLE (Typically Offered: Fall Term, 1st 8 Weeks)

DASC 5400 Data Simulation, Bayesian Modeling, and Inference. The course will cover data simulation, statistical modeling techniques and inference.? Topics included will be differing methods of regression and model selection, Markov Chain Monte Carlo methods, EM algorithm, bootstrapping and other computational statistical models. Prerequisite: DASC 5200. Typically offered: Summer Session II 0 semester credit hour/s.
Campus: LISLE (Typically Offered: Summer Term)

DASC 6398 Capstone Project. This course will focus on defining a research question, literature review of the current state of the art in the particular subfield, collecting an appropriate dataset to evaluate the research question, and high-level design of the algorithmic solution and implementation of the solution. Prerequisite: Departmental Consent 3 semester credit hour/s. Department Consent Required.
Campus: LISLE (Typically Offered: Spring Term)

Objectives

Students in the Master of Data Analytics program will achieve the following student learning outcomes (SLO):

Student Learning Outcome 1:#Demonstrate a comprehensive understanding of the Python Programming language.
• University SLO: 5. Analytical Skills

Student Learning Outcome 2: Gain expertise in effectively communicating insights from data analysis.
• University SLO: 3.#Communication Skills;

Student Learning Outcome 3: Demonstrate a strong understanding of algorithms applicable to data science.
• University SLO: 2. Critical and Creative Thinking Skills;

Student Learning Outcome 4: Develop a research question and design analysis related to that question.
• University SLO: 1.#Disciplinary Competence and Skills;