BUSINESS ANALYTICS

Program Director: Dr. Natalie Gerhart
Program Chair: Dr. Maggie Knight
Program Office: Harper Center

Graduate Study in Business Analytics

The Master of Science (M.S.) in Business Analytics (BA) degree is a 33 credit hour program. The program focuses on using analytics to improve business decision making. Graduates will exhibit statistical thinking, computation thinking, data literacy, storytelling skills, and business acumen. The core courses cover descriptive, predictive, and prescriptive analytics as well as analytics focus on ethics. Courses will mainly be online with few options for on-campus courses.

Program Learning Goals and student learning outcomes

Program Mission: To develop business analysts with skills to turn data into actionable insights.

Creighton-formed business leaders will:

PLG 1: Exhibit disciplinary knowledge in Business Intelligence and Analytics.

SLO 1A: Analyze data for business decisions.

SLO 1B: Design and interact with a database.

SLO 1C: Create clear and actionable data visualizations.

PLG 2: Think critically to aid business decision-making.

SLO 2A: Apply computational thinking to diagnose and address business challenges.

PLG 3: Communicate results to business audiences.

SLO 3A: Write recommendations based on data analyses.

SLO 3B: Utilize storytelling techniques to verbally convey results.

PLG 4: Demonstrates care for others.

SLO 4A: Analyze a business ethics situation and propose a course of action.

SLO 4B: Evaluate the implications of analytics as it relates to diversity.

PLG 5: Exhibit personal habits consistent with leadership formation.

SLO 5A: Reflect on and articulate the relationships among personal values, professional obligations, and social responsibilities.

Admission

1. **Eligibility for Admission:** Applicants for admission to the M.S. program must have a baccalaureate degree, regardless of the undergraduate field of study, and an acceptable level of scholarship from an accredited institution of higher education, along with the following documents:
2. **Application:** A completed application form, personal essay discussing how a master's degree fits in with an applicant's career plans and which aspects of Creighton's M.S. program are most appealing, current resume, and a non-refundable application fee.
3. **Recommendations:** Two recommendations are required. The recommendations should be completed by persons other than family members who are capable of assessing an applicant's performance in an academic or work setting.
4. **Transcripts:** One official transcript must be sent from each institution of collegiate rank attended by the applicant. Transcripts should be sent directly from the collegiate institution to the Enrollment Services, Harper Center, 2500 California Plaza, Omaha, NE 68178. All such transcripts become the property of Creighton University.
5. **Graduate Management Admissions Test (GMAT)**: The Graduate Management Admission Test (GMAT) is not required for applicants who have work experience and a minimum 3.00 cumulative GPA across all institutions attended. If the applicant's cumulative GPA is less than 3.00, the GMAT is required. For applicants without work experience, and for all applicants to the MIMFA and MFIN programs, a minimum 3.50 cumulative GPA is required for the GMAT waiver. All international students whose undergraduate degree was not granted by a US institution will be required to submit a GMAT score.   Regardless of the applicant's cumulative GPA, the admissions committee reserves the right to require an applicant to submit a GMAT score if there are concerns regarding the applicant's work experience and/or the student's achievement across all math, statistics, economics and finance courses previously completed.
6. **Test of English as a Foreign Language:** The Graduate School requires all students who are native speakers of languages other than English to demonstrate competence in English. International applicants who received their baccalaureate degree from an accredited institution from the following countries are not required to show proficiency in English; Australia, Canada, Barbados, Bahamas, Bermuda, British Virgin Islands, Cayman Islands, Dominica, Grenada, Guam, Ireland, Jamaica, Marshall Islands, New Zealand, St. Kitts, St. Lucia, Scotland, Singapore, Trinidad and Tobago, United Kingdom, United States, and Virgin Islands. There are 3 test scores that can be used to demonstrate competence in English. Only one of the three must be provided. **1) TOEFL:** score of 90 or above on the Internet-based Test (TOEFL iBT) with no section below 20. **2) IELTS:** overall band score of at least 6.5 with no section below 6. **3) Duolingo:** score of 110 or above.
7. **Financial Ability:** All international applicants must provide a "Certification of Available Finances" form in order for the I-20 form to be issued by the Office of International Programs if an applicant is admitted to the program.
8. **Prerequisites:** Proficiency in programming and foundational statistics is necessary for this program. Students can demonstrate proficiency in these areas with prior courses or professional experience. Those that do not have proficiency can meet this requirement with courses as part of the program.

Acceptance to the M.S. Program is granted to applicants who clearly demonstrate that they have high promise of succeeding in graduate business study. Interviews are not required as part of the admission process.

Degree Programs

- M.S., Business Analytics (http://catalog.creighton.edu/graduate/graduate-programs-courses/business-intelligence-analysis/business-intelligence-analytics-ms/)
- MBA/MS-BIA Dual Degree (http://catalog.creighton.edu/graduate/graduate-programs-courses/master-business-administration/mba-bia-dual-degrees/)

Graduate Certificate in Business Analytics

- Business Analytics (http://catalog.creighton.edu/graduate/graduate-programs-courses/business-intelligence-analysis/graduate-certificate-business-analytics/)

Courses

BIA 603. Python Programming for Analytics. 3 credits.
This course provides a foundation in Python, focusing on how it is used for data analytics. This course will teach several things: the mental model of a programmer, how to problem-solve using computational thinking, how to devise creative solutions to problems, the terminology of technology/computers/software/hardware, and of course, some programming. Popular data analytics libraries will also be incorporated, including Pandas, NumPy, and SciPy.

BIA 729. Statistics for Business Analytics. 3 credits.
Properly applying statistical methodology to the analysis of business data benefits from a firm grasp of statistical concepts and techniques. This course strives to bring depth to the business analyst's toolbox of statistical methods by introducing the fundamental mathematical and statistical concepts underpinning modern statistical methods of data analysis.

BIA 742. Predictive Analytics. 3 credits.
Predictive analytics allows organizations to predict future outcomes by studying the relationships among variables from existing data. This course discusses the process of developing, evaluating, and deploying predictive models in an application-oriented environment. The course is applied in nature and extensively uses business examples, readings, and hands-on exercises to reinforce the concepts. P. BIA 603, BIA 729, or IC.

BIA 746. Applications of Optimization Modeling. 3 credits.
The overarching purpose of this course is to help students improve their quantitative skills and make better decisions with the aid of mathematical modeling tools. This course introduces students to the basics of optimization modeling and analyses. Specifically, students will have a working knowledge of linear, non-linear, and integer programming models in a variety of business contexts. In addition, sensitivity analyses and "what if" scenarios will be examined. P. BIA 729.

BIA 755. Data Wrangling. 1.5 credit.
Methodologies and tools for acquiring data from multiple sources and combining them to create useable data sets are critical to fully harness the potential of big data and analytics. Topics such as data validation, handling missing data, data acquisition and web scraping are discussed. P. ANX 603 or Coding experience or IC.

BIA 762. Survey of Business Intelligence and Analytics. 3 credits.
Business Intelligence (BI) and Data Analytics are at the forefront of modern business management and have become key components in accomplishing strategic and operational goals. This course explores the fundamental sources of BI and surveys the current and emerging landscape of data analytics, while introducing techniques and tools used to transform data into actionable information.

BIA 764. Data Governance. 3 credits.
This course explores the elements of data governance (e.g., principles, policies, functions, metrics, technology, tools, etc.), along with the process of designing, deploying and sustaining an effective data governance program which is essential to analytics-driven organizations. Additionally, students will explore master data management (MDM), data quality, and security, privacy, and regulatory compliance topics. P. BIA 762 or IC.

BIA 766. Graduate Internship. 1-3 credits.
This course is intended to provide graduate-level credit for significant program-related practical experience, coupled with a research component that utilizes the context of this practical experience as its primary vehicle of inquiry. Students must work a minimum of 150 hours for the sponsoring employer during the semester. In addition, the student must complete a research project related to this work, which has been planned and carried out under the direction of a graduate faculty supervisor, with the approval and cooperation of the sponsoring employer. The student's internship employment and faculty supervision for the research component must be arranged before registration for the course will be allowed. The course is graded Satisfactory/Unsatisfactory and only 3 hours of internship credit may be used to satisfy graduation requirements. P. IC and approval of the Associate Dean for Graduate Business Programs.

BIA 770. Cybersecurity. 3 credits.
This course will provide students with a solid technical understanding of cybersecurity or computer security. Students will gain an understanding of security concepts and explore a variety of technical tools that cover a wide range of security topics including governance, network security, database security, application security, cryptography, access controls, and incident and disaster response.

BIA 772. Data Visual Analysis and Visualization. 3 credits.
Information Visualization is an active area in BIA. The presence of big data in business today, along with the need for fast, accurate, and timely decisions based on information make information or data visualization critical. While there is a lot of data available, communicating insights and data storytelling are sought after skills that will be central to this course. P. BIA 729 or IC.

BIA 775. Ethics in Data Analytics. 1.5 credit.
Students will be introduced to the concept of big data ethics, and become familiar with some of the key types of ethical challenges in this area, as well as ethical precepts and moral codes to give them guidance. From this course students should be able to identify ethical considerations and reason critically to arrive at moral decisions with issues surrounding big data, particularly privacy and confidentiality, responsible use of data, and accurate representation of data and avoidance of algorithmic bias.

BIA 776. Ethics in Business Analytics. 3 credits.
This course considers the relationships between business and society, considering the ethical questions in analytics. Students should be able to identify ethical considerations and reason critically to arrive at moral decisions with issues surrounding analytics, particularly privacy and confidentiality, responsible use of data, and accurate representation of data and avoidance of algorithmic bias.

BIA 781. Machine Learning. 3 credits.
This course is designed to provide students with a foundation in machine learning as used in business analytics. Machine learning, while not a new field, has become of increasing interest to business due to its ability to provide predictive ability. Topics covered include machine learning approaches to prediction, classification and clustering. P. BIA 603 and BIA 729.

BIA 782. Database Management Systems. 3 credits.
This course provides an introduction to business database applications. Students will learn data modeling, relational database design techniques, and strategies for collecting, storing, manipulating, and retrieving data. Students will also be introduced to other Big Data concepts.

BIA 789. Seminar:Advanced Topics in Information Technology Management. 1-3 credits.
The content of this course will vary depending on the topic and instructor. With the permission of the instructor, the course can be repeated one time for credit, provided the course content is different. P. The prerequisites will depend on the course content.

BIA 794. Business Analytics Readings. 3 credits.
This is a readings course where students study books, articles, and position papers about a specific chosen business analytics topic. This course seeks to expand students' thinking and provides an opportunity for self-reflection. This is accomplished by reading, analyzing, sharing, reflecting and then reformulating the way we look at things/concepts in the Business Intelligence & Analytics realm. The readings will vary depending upon the theme/topic. P. Instructor Consent.

BIA 795. Independent Study and Research. 1-3 credits.
This course is for the study of topics that do not enjoy regular course offerings. P. IC and approval of the M.S.-BIA Program Director.