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Business Analytics

The Bachelor of Science (B.S.) in Business Analytics prepares students for applying data analytics skills, artificial intelligence and machine learning knowledge to strengthen business strategies. Students will understand the goals and strategies of business, formulate business problems, develop models to solve these problems, utilize structured and unstructured data, and apply artificial intelligence and machine learning tools to analyze and solve business problems.

A major in Business Analytics requires students to earn a minimum grade of C (a grade of C- is not sufficient) in each of the courses taken to satisfy the requirements for the Business Analytics major, and students must earn a minimum 2.0 grade point average for those major courses. For Business Analytics majors, Business Analytics courses completed more than seven calendar years prior to the current term must be repeated.

Bachelor of Science (B.S.) in Business Analytics Degree Requirements

Degree Requirements	Credit Hours
University Core Curriculum Requirements	39
Professional Business Core	44
Requirements for Major in Business Analytics (Minimum grade of C required for all classes in major area)	30
BSAN 301, BSAN 302, BSAN 307, BSAN 403, BSAN 404, BSAN 405, BSAN 406, and MGMT 360	24
Select TWO of the following: BSAN 420, BSAN 421, BSAN 462, BSAN 463, BSAN 464, BSAN 469, BSAN 480, BSAN 491, BSAN 494, BSAN 495	6
Electives (Any additional hours of college-level credit can be used) ¹	7
Total	120

¹ 120 semester hours are required for graduation. Any additional hours of college level credit can be used to equal minimum 120 semester hours required for degree.

Business Analytics Minor

A minor in Business Analytics will prove useful for students in any discipline working with big data or new technologies such as artificial intelligence, especially in applying those technologies in business settings.

A minor from the College of Business and Analytics requires students to earn a minimum grade of C (a grade of C- is not sufficient) in each of the courses taken to satisfy the requirements for their minor. At least nine of the 15 credit hours must be taken at Southern Illinois University Carbondale. An advisor within the College of Business and Analytics must be consulted before selecting this field as a minor.

Business Analytics Minor Requirements

Degree Requirements	Credit Hours
Required courses: BSAN 301, BSAN 302, BSAN 404, BSAN 406	12
Choose one course from the following four: BSAN 307, BSAN 403, BSAN 405, or MGMT 421	3
Total	15

Capstone Option for Transfer Students

The Capstone Option is available to students who have earned an Associate in Applied Science (A.A.S.) degree or have the equivalent certification and who have a cumulative 2.0/4.0 GPA on all accredited coursework prior to the completion of the A.A.S. or certification, as calculated by the transfer institution's grading policies. The Capstone Option reduces the University Core Curriculum requirements from 39 to 30 hours, therefore reducing the time to degree completion. Students who apply for the Capstone Option will work with the College of Business and Analytics Advisement Office for approval of the Capstone Option and will complete a personal contract for a degree completion plan.

Differential Tuition

The College of Business and Analytics assesses differential tuition for College of Business and Analytics majors. The College of Business and Analytics has a “minor program fee” for majors outside of the College of Business and Analytics that want to declare a minor through the College of Business and Analytics. The minor program fee is equal to 15% of 15 credit hours of applicable tuition for declared College of Business and Analytics minors.

Business Analytics Courses

The Bachelor of Science (B.S.) in Business Analytics prepares students for applying data analytics skills, artificial intelligence, and machine learning knowledge to strengthen business strategies.

BSAN301 - Business Intelligence This course is an introduction to data-based decision making in business. It examines business problems and the sources of data, applications, infrastructure, tools, and best practices in business intelligence. This course includes information gathering, management, retrieval, and processing to optimize decisions and performance. Restrictions: 2nd Year standing or school approval. Credit Hours: 3

BSAN302 - Data Science I Introduction to data science. This course introduces the student to the process of data science from data gathering, to data exploration, to data modeling, to communicating the results. Emphasis is on business data and its application to business decision making. Introduction to data science tools and techniques. Prerequisite: BSAN 301 with a grade of C or better. Restrictions: 2nd Year standing or higher or school approval. Credit Hours: 3

BSAN307 - Ethics of Analytics This course explores the thoughtful balance and wide gaps between what is technically possible, what an organization would like to do, and what is legally allowable. Privacy, confidentiality, security, and data ethics policies and processes. Background and development of codes of data and analytics ethics. Restrictions: 2nd Year standing or school approval. Credit Hours: 3

BSAN352 - Management Science This course is an introduction to mathematical model building. The focus of this course is on modeling business problems and the solution techniques commonly used to solve such models. Topical coverage includes decision theory, mathematical programming, network models, scheduling models, queuing models, and simulation. Prerequisite: MATH 139, MATH 140; ACCT/ FIN/MGMT 208, MGMT 318, MGMT 345 with a grade of C or better. Restrictions: College of Business and Analytics majors or minors, 3rd Year standing; or program approval required. Crosslisted with MGMT 352. Credit Hours: 3

BSAN403 - Data Science II Advanced data science. Extensive exploration of data and its role in organizations. Analysis of large amounts of structured data as well as big data such as text, video, audio, and social media. Use of current analytics tools and techniques for applied data analysis and critical evaluation of next generation statistical techniques. Prerequisite: BSAN 302 with a grade of C or better. Credit Hours: 3

BSAN404 - Artificial Intelligence in Business An introduction to artificial intelligence and expert systems and their application to business problems. We explore and implement AI: expert systems, neural nets, and deep learning systems. These systems are becoming critical to organizations as they try to cope with a rapidly changing world that is forcing them to make faster data-based decisions. This course will cover the history, promises, limitations, and future directions of artificial intelligence in business. Prerequisite: BSAN 301 with a grade of C or better. Credit Hours: 3

BSAN405 - Machine Learning in Business Machine learning and its application to business data and business problems. Where AI and expert systems improve human decision making, machine learning is able to progressively improve its performance in detecting patterns in data and applying solutions with minimal human intervention in a rapidly changing environment. Tools, techniques, and processes for developing machine learning systems. Prerequisite: BSAN 404 with a grade of C or better. Credit Hours: 3

BSAN406 - Information Visualization Computer-based information visualization helps people explore data through interactive software in order to gain meaningful and actionable insights. This course will help you to programmatically design cognitively useful spatial mapping of data with the purpose of aiding future decision making. This course covers topics including computer graphics and programming, human-computer interaction, semiotics, and cartography. Prerequisite: BSAN 301 with a grade of C or better. Credit Hours: 3

BSAN420 - Analytics of Project Management Application of project management principles for improving business. Coverage includes, but is not limited to: introduction to the principles of project management, Project Management Institute (PMI) guidelines, US and international project management scenarios, and working together as a project management team. Students will work with Project Management Body of Knowledge (PMBOK) guidelines. Students will accrue enough education hours to sit for the PMI CAPM certification. Crosslisted with MGMT 420. Credit Hours: 3

BSAN421 - Information Systems Analysis and Design Strategies and techniques for structured analysis and design in the development of information systems. System development using structured tools/techniques for describing process flows, data flows, and data structures. Alternative methods of system development are also discussed. Crosslisted with MGMT 421. Credit Hours: 3

BSAN434 - Risk Management This course includes a survey and application of various risk management techniques with an emphasis on commodity risk management. Topics include: pricing theories of futures and options, examination of firm risk, and the use of a trading room to simulate risk management techniques. Prerequisite: FIN 432. Restrictions: College of Business and Analytics majors, 3rd Year standing or higher; or program approval required. Cross listed with FIN 434. Credit Hours: 3

BSAN462 - Working Capital Management Liquidity analysis and management with a focus on managing cash, marketable securities, accounts receivable, inventory, banking relationships and short-term financing. Prerequisite: FIN 361 with a grade of C or better or concurrent enrollment. Restrictions:

College of Business and Analytics majors or minors, 3rd Year standing or higher; or program approval required. Crosslisted with FIN 462. Credit Hours: 3

BSAN463 - Introduction to Applied Econometrics Applications of statistical tools to specific economic problems. Numerous examples will be examined in order to achieve this goal. Emphasis will be given to model misspecification, non-classical estimation techniques, data analysis, and simultaneous equations. This course includes a research project in which students formulate a research question, review literature related to the question, gather relevant data, and provide a research conclusion using tools learned in this and other courses. The student will communicate their research findings via a written paper, and if possible, via an oral presentation. Prerequisite: ACCT/ECON/FIN/MGMT 208 with a grade of C or better or consent of instructor. Crosslisted with ECON 463. Credit Hours: 3

BSAN464 - Forecasting and Capital Budgeting Long-term forecasting techniques used in business; alternative approaches to capital structure decisions, cost of capital measurement; and performance measurement for investment decisions including mergers and leasing; explicit consideration of certainty, risk, and uncertainty in investment analysis; theory and applications in private and public sectors. Prerequisite: FIN 361 with a grade of C or better or concurrent enrollment. Restrictions: College of Business and Analytics majors or minors, 3rd Year standing or higher; or departmental approval required. Crosslisted with FIN 463. Credit Hours: 3

BSAN469 - Financial Analytics and Security Valuation Study of the corporation's financial problems and their causes and solutions. Emphasis given to the impact of these financial problems on how the market values securities. Topics include liquidity and leverage analysis, analysis of profitability, and other financial analysis tools. Prerequisite: FIN 361 with a grade of C or better. Restrictions: College of Business and Analytics majors, 3rd Year standing or higher; or school approval required. Crosslisted with FIN 469. Credit Hours: 3

BSAN480 - Marketing Research and Analysis The purpose of this course is to teach you the skills needed to execute marketing research projects or use marketing research information to make better marketing decisions. To do this, the course covers the techniques such as, determining if marketing research is needed, problem definition, research designs, survey design, sampling issues, data collection, and data analysis. The course also covers interpretation of results as well as recommendations for marketing managers/take-aways from the research. The deliverable for this course is a full marketing research report. Prerequisites: MATH 139; ACCT/ECON/FIN/MGMT 208 and MKTG 304 with a grade of C or higher. Restrictions: College of Business and Analytics majors, 3rd Year standing; program approval required. Crosslisted with MKTG 480. Credit Hours: 3

BSAN491 - Independent Project in Business Analytics BSAN 491 allows students to pursue an independent project working one-on-one with a faculty member in the BSAN program. The objective is for students to apply what they have learned in the program to a novel project fitting the student's interests. A student will identify a business problem, design a methodology for solving that problem, and execute that methodology to determine a best strategy for the business. Prerequisites: MGMT 360, BSAN 301, BSAN 302, and BSAN 403, each with a minimum of a C; completion or concurrent enrollment in BSAN 406; and prior approval from Business Analytics Program Coordinator. Credit Hours: 3

BSAN494 - Data Analysis in Marketing This course is designed to equip marketing and other business students with the ability to translate data into actionable managerial decisions. Students learn how to manage and analyze data, which is available to organizations more than ever before, through a systematic process which includes data management (preparing data for analysis) and applied quantitative analysis, including statistical models. The focus will be on decisions that marketing managers have to make on a daily basis including marketing mix decisions. Prerequisite: MKTG 480 with a C or better. Crosslisted with MKTG 494. Credit Hours: 3

BSAN495 - Internship in Business Analytics Supervised work experience that relates to the student's academic program and career objectives. Course credit can be used to satisfy the 300-400 level CoBA elective. If the student has already satisfied the 300-400 level CoBA elective, the student can apply credit towards the general elective requirement of the BSAN major. Mandatory Pass/Fail only. Not for graduate credit. Restrictions: Business Analytics majors, 3rd Year standing or higher. Special approval needed from the School. Student can take course for two semesters. Credit Hours: 3

Business Analytics Faculty

DeYong, Gregory D., Associate Professor, Management, Ph.D., Indiana University 2010; 2013.
Operations management.

Islam, Md. Shariful, Assistant Professor, Accountancy, Ph.D., Louisiana Tech University, 2019; 2019.
Accounting information systems, auditing, data analytics.

Kamran-Disfani, Omid, Assistant Professor, Marketing, Ph.D., University of Missouri-Columbia, 2019;
2019. Data analytics.

Nelson, H. James, Associate Professor, Management, Ph.D., The University of Colorado, 1999; 2005.
Analytics, artificial intelligence, information systems.

Perry, Timothy T., Clinical Assistant Professor, Finance, Ph.D., Texas Tech University, 2009; 2019.
Financial analytics.

Sylwester, Kevin, Professor and Director, School of Analytics, Finance, and Economics, Ph.D. University
of Wisconsin-Madison, 1997; 1998. Macroeconomics, data analytics.

Thomas, Tomcy, Visiting Assistant Professor, Business Analytics, Ph.D., University of Tennessee -
Knoxville, 2019; 2023. Supply chain analytics, management analytics.

Last updated: 02/11/2025