Business Analytics

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School of Business
Bachelor of Science Degree

The Bachelor of Science degree in Business Analytics is designed to prepare students for jobs that require data analysis skills, data visualization, and presentation skills that are essential to decision making in organizations.

The explosive growth of technologies and applications that collect data and generate information is changing the business landscape. Current and new technologies and social media provide abundant information (i.e., big data) to businesses and organizations. Consequently, today’s challenge is to extract useful information from big data (data mining); to interpret that information (descriptive analytics), to predict the future (predictive analytics), and to make decisions that would help organizations to achieve their goals (prescriptive analytics).

The Business Analytics program will teach students the necessary skills to work with large data sets and perform data mining tasks to enable evidence-based decision making. Graduates from the BS in Business Analytics will have powerful analytical skills combined with a strong business background. Therefore, graduates from the program will succeed in the changing business environment and will have the foundation necessary to pursue advanced degrees in the field as well.

Typical Employment Opportunities

Management Analyst
Market Research Analyst
Sports Statistical Analyst
Finance Analyst
Computer Systems Analyst

Business Analytics (BS) Program Outcomes:

- Graduates will demonstrate strong core discipline knowledge in accounting, finance, legal environment of business, management, marketing, and operations management.
- Graduates will evaluate ethics and social responsibility issues.
- Graduates will analyze business situations and offer reasoned, actionable suggestions leading to problem resolution.
- Graduates will demonstrate effective written and verbal communication skills supported by current technology.
- Graduates will evaluate the impact of the political, cultural and legal context surrounding global business operations and their effect on local business operations.
- Graduates will summarize and interpret each step in the analytics process and apply appropriate analytics software and tools (data collection, data mining, descriptive analytics, predictive analytics, and prescriptive analytics).
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<th>Course Description</th>
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<td>Liberal Arts and Sciences (61 credits)</td>
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<td>EGL 101 Composition I: College Writing (GE)</td>
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<td>Foreign Language elective (GE)</td>
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<td>Math or Natural Science elective</td>
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<td>American/Other World/Western Civilization (GE)</td>
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<td>Arts elective (GE)</td>
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<td>BUS 101 Accounting I</td>
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<td>BUS 109 Management Theories and Practices</td>
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<td>BUS 131 Marketing</td>
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<td>BUS 201 Corporate Finance</td>
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<td>BUS 345 Introduction to Business Analytics</td>
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<td>ECO 380 Econometrics</td>
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<td>BUS 345 Foundations of Business Analytics</td>
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<td>BUS 409 Strategic Management</td>
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BUS 440W Visual Analytics 3
BUS 445 Advanced Business Analytics 3
BUS 448 Business Analytics Project 3
Technical Elective 3
Technical Elective (300 level or higher) 3
Free Elective 3 credits
Free Elective (300 level or higher) 9 credits
Total Credits 121

Degree Type: BS
Total Required Credits: 121

Please refer to the General Education, Applied Learning, and Writing Intensive requirement sections of the College Catalog and consult with your advisor to ensure that graduation requirements are satisfied.

Notes:

Technical Electives:

BUS 386 Marketing Analytics
BUS 314 Supply Chain Analytics
BUS 319 Marketing Research
BUS 387 Financial Analytics
MTH 246 Introduction to Financial Mathematics
MTH 346 Continuous Time Finance
BCS 260 Introduction to Database Systems
BCS 425 Business Intelligence and Data Warehousing

Course Descriptions

EGL 101 Composition I: College Writing (GE)
This is the first part of a required sequence in college essay writing. Students learn to view writing as a process that involves generating ideas, formulating and developing a thesis, structuring paragraphs and essays, as well as revising and editing drafts. The focus is on the development of critical and analytical thinking. Students also learn the correct and ethical use of print and electronic sources. At least one research paper is required. A grade of C or higher is a graduation requirement.
Note: Students passing a departmental diagnostic exam given on the first day of class will remain in EGL 101; all others will be placed in EGL 097. Prerequisite is any of the following: successful completion of EGL 097; an SAT essay score (taken prior to March 1, 2016) of 7 or higher; an SAT essay score (taken after March 1, 2016) of 5 or higher; on-campus placement testing.

EGL 102 Composition II: Writing About Literature
This is the second part of the required introductory English composition sequence. This course builds on writing skills developed in EGL 101, specifically the ability to write analytical and persuasive essays and to use research materials correctly and effectively. Students read selections from different literary genres (poetry, drama, and narrative fiction). Selections from the literature provide the basis for analytical and critical essays that explore the ways writers use works of the imagination to explore human experience. Grade of C or higher is a graduation requirement. Prerequisite(s): EGL 101

MTH 116 College Algebra (GE)
This course is designed to provide students with a firm foundation in symbolic manipulation and algebraic reasoning. Both manipulative skills and conceptual understanding of algebraic principles are stressed. Topics include equivalent expressions and equations, linear functions, properties of exponents and logarithms, quadratic equations, power functions, exponential functions. Upon completion of this course students will be prepared for precalculus as well as for quantitative courses in the natural and social sciences. Prerequisite(s): MP2 or MTH 015

ECO 156 Principles of Economics (Macro) (GE)
This course is designed to introduce classic macroeconomic issues such as unemployment, inflation, national income and economic growth. The course will provide a unified framework to address these issues and to study the impact of different policies, such as monetary and fiscal policies, on the aggregate behavior of the economy. Analytical tools will be used to understand the experiences of the United States and other countries, and to address how current policy initiatives affect their macroeconomic performance.

ECO 157 Principles of Economics (Microeconomics)
This course introduces students to fundamental economic concepts and theory, including demand, supply, and the formation of equilibrium prices in product and resource markets. Students will learn a specific set of analytical tools as well as how to apply them to current policy issues. In addition, the course offers an introduction to applied fields such as industrial organization (market structures), labor economics, international trade, and market failure.

BUS 141 Contemporary Business Communication (GE)
An introduction to the role and importance of effective communications in business. Key topics include the familiarization and practice in preparing common types of internal and external business communications; contemporary issues in business communication relating to technology, ethics, and nondiscriminatory language; memo and report writing with proper mechanics, style, and appropriate tone/attitude; and business presentations. Prerequisite(s): EGL 101 and BCS 102

EGL 310 Technical Writing
A detailed study of the fundamentals of writing technical reports and other technical communications. Topics emphasized include the elements of a technical report, the interpretation of statistics and data, and the composition of letters, memos, and informal reports containing technical information. Assignments and student exercises are drawn from the student's technical area. Prerequisite(s): EGL 102 with a grade of C or higher

BUS 101 Accounting I
Fundamental accounting concepts and principles are covered through an understanding of the following topics: accounting as an information system; analyzing a transaction; the accounting cycle; accounting for both service enterprises and merchandising businesses; deferrals and accruals; reversing entries; systems design; accounting for cash, receivables,
temporary investments and inventory; payroll accounting. Students apply concepts to the preparation of special journals, subsidiary ledgers, worksheets and financial statements.

**BUS 102 Accounting II**
Continued development of the principles and concepts introduced in Accounting I. The following topics are included: emphasis on further understanding of generally accepted accounting principles; plant assets; intangible assets; determination of depreciation, depletion and amortization; accounting for partnerships and corporations; long term liabilities; investments in bonds and stock; statement of cash flows; managerial accounting; accounting for manufacturing operations; budgeting and standard costs systems. Prerequisite(s): BUS 101 with a grade of C or higher

**BUS 109 Management Theories and Practices**
This introductory course covers management principles pertaining to human resources, individual behavior in organizations, employee motivation and performance, and business ethics. Topics also include managing and the manager’s job; planning and decision making; employee performance appraisal and feedback; leadership and influence processes; interpersonal relations and communication; and managing work groups and teams.

**BUS 131 Marketing**
This course provides the student with a sound knowledge of the basic elements of the marketing process. Major topics include the features of consumer and organizational markets, market segmentation, and target market strategies. Product planning and development, brands, packaging and other product features are covered. Price determination and the use of various pricing strategies are discussed. The factors in the selection of channels of distribution and the features of wholesaling and retailing are considered. Elements of the promotional process such as sales, advertising, and sales promotion are included. Ethical and legal issues in marketing, marketing of services, global marketing, and marketing on the Internet are also covered.

**BUS 240: Business Statistics OR**
This course provides an understanding of statistical concepts and tools that are critical in business decision-making. The discussion and development of each topic is presented in an application setting, with the statistical results providing insights and solutions to real world problems. Students will be able to calculate and perform various analyses, including but not limited to: Interval Estimation, Hypothesis Testing, Test of Goodness of Fit, and Independence and Regression Analysis. The coursework requires extensive use of commercially available statistical software. Prerequisites: MTH 117 or MTH 129

**BUS 201 Corporate Finance**
The overall aim of this course is to help students develop an understanding and appreciation of Finance as a business discipline - an analytical approach in assessing the financial worthiness of a business entity is stressed. Topics covered include time value of money; financial statement analysis; valuation models; risks and rates of return; calculating beta coefficients; working capital management; capital budgeting; the cost of capital leverage and dividend policy; and financial forecasting. Prerequisite(s): BUS 101 and 102

**BUS 345 Introduction to Business Analytics**
This course introduces the primary business analytics concepts and tools. The course presents an overview of basic statistics, data mining, data visualization, optimization, and decision analysis. The course incorporates the use of Excel spreadsheet modeling capabilities in order to prepare students to model and solve real world problems. Prerequisite(s): BUS 240 or MTH 110 with a grade of C or higher

**BUS 385 Business Data Management**
In this course students will learn the concepts, principles and techniques used to collect, store, and retrieve data for business purposes. The objective of the course is to provide students with a background that allows them to understand management
of data in the context of business organizations and corporations. Topics include a review of data types, modeling data in the organization and database design; an introduction to SQL and an introduction to data warehousing and big data. Prerequisite(s): MTH 116 with a grade of C or higher and Junior level status

**BUS 300 Operations Management**  
This course undertakes an examination of the role of operations within manufacturing and service organizations. Emphasis is placed upon recognizing operational opportunities and tradeoffs, and employing quantitative and qualitative tools and decision support systems to assist strategic and operational decision-making. The general functions of operations management as applied to the transformation process are covered. Some of the important topics include but not limited to Forecasting, Statistical Quality Control, Inventory Management, Linear Programming, and Transportation Models. Note: Students who have previously completed IND 301 cannot receive credit for BUS 300. Prerequisite(s): BUS 240 or MTH 110

**BUS 340 Advanced Business Statistics OR**  
This course covers advanced statistical concepts and techniques as applied to decision making and business applications. Topics include: estimating population values, hypothesis testing for one and two populations, analysis of variance, linear regression and correlation analysis, multiple regression analysis and model building, statistical process control, analyzing and forecasting time-series data, and decision-making analysis. Prerequisite(s): BUS 240, statistics course or Department approval.

**BUS 345 Foundations of Business Analytics**  
This course introduces the primary business analytics concepts and tools. The course presents an overview of basic statistics, data mining, data visualization, optimization, and decision analysis. The course incorporates the use of Excel spreadsheet modeling capabilities in order to prepare students to model and solve real world problems. Prerequisite(s): BUS 240 or MTH 110 with a grade of C or higher

**BUS 409 Strategic Management**  
This course covers key strategic management topics including internal and external scanning for SWOT (strengths, weaknesses, opportunities, and threats) analysis, competitive advantage, cost versus differentiation, horizontal and vertical integration, strategic alliances, strategy implementation, as well as many other important topics. Special attention will be paid to international contexts, issues of ethics and governance, and measurements of strategic success. Students will be required to present oral and/or written case studies and analyses. Students who have previously completed IND 409 cannot receive credit for BUS 409. Note: Students cannot get credit for BUS 409 and 409W; BUS 409W can be used to fulfill the writing intensive requirement. Prerequisite(s): BUS 300, Senior level status

**BUS 440W Visual Analytics**  
This course focuses on the visualization techniques used to represent Business Information. The course enables students to answer three questions: What data do the final users need to see? What is the most effective way to develop and design the representation of data? How could the proposed visual representation be constructed? Topics covered include information visualization techniques for abstract data, visualization for spatial data, and visual analytical techniques applied to data transformation and visual exploration. This course is hands-on work intensive and helps develop skills in the use of modern visualization tools. Prerequisite(s): EGL 101 and BUS 340 with a grade of C or higher

**BUS 445 Advanced Business Analytics**  
This course focuses on the advanced tools and techniques used in business analytics. The course is divided in two major areas: machine learning and social network analytics. The first part will focus on key concept from machine learning such as nearest neighbors, decision trees and neural networks. R is the main tool used to implement these techniques. The second part is focused on tools and techniques used to analyze social networks structures and develop solutions to aid decision making. Prerequisite(s): BUS 340 with a grade of C or higher
BUS 448 Business Analytics Project
This is a capstone course that focuses on the solution of real-life problems in business analytics. During the course students have the opportunity to apply the knowledge acquired through the program. Students will frame the problem, collect and process data, and use the analytics framework (descriptive, predictive, and prescriptive analytics) to obtain solutions and provide recommendations. Prerequisite(s): BUS 440 with a grade of C or higher

Admission to Farmingdale State College - State University of New York is based on the qualifications of the applicant without regard to age, sex, marital or military status, race, color, creed, religion, national origin, disability or sexual orientation.