Analytics is a challenging and exciting field that helps people make important informed decisions based on quantitative information. Business analysts make extensive use of data modeling, statistical techniques, and scenarios to manipulate data to find meaning, explain causation, and make predictions.

Currently, massive amounts of structured and unstructured data are collected and stored by computers as a result of business and society’s greater dependence on information technologies and software applications to transact business and every-day life. As such, data analytics skills are highly portable and becoming a frequently sought competency in workers. Analytics is a valuable partner to almost any field of study, including engineering, agriculture, social science, medical science, environmental science, forestry, marketing, accounting, and finance.

**Business Analytics**

**Bachelor of Science in Business Administration Major Requirements**

(185 credits required for the degree) (http://bulletin.du.edu/undergraduate/undergraduateprograms/traditionalbachelorsprogram/bachelorofscienceinbusinessadministration)

Minimum of 44 credits. Requirements include:

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>INFO 3100</td>
<td>Automating Business Processes</td>
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<tr>
<td>INFO 3140</td>
<td>Foundations of Information Management</td>
<td>4</td>
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<tr>
<td>INFO 3200</td>
<td>Business Forecasting and Visualization</td>
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<tr>
<td>INFO 3240</td>
<td>Enterprise Information Management</td>
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<tr>
<td>INFO 3300</td>
<td>Data Warehousing and Data Mining</td>
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<td>INFO 3340</td>
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<tr>
<td>INFO 3400</td>
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<td>INFO 3440</td>
<td>Optimization Modeling</td>
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<td>INFO 3500</td>
<td>Capstone/Senior Project</td>
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</table>

**Electives**

Select eight credits of INFO coursework

**Total Credits**

### MINOR REQUIREMENTS

The Business Analytics minor is available to all traditional DU undergraduate students.

24 credits, including:

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>INFO 1010</td>
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<tr>
<td>INFO 1020</td>
<td>Analytics II: Business Statistics and Analysis ¹</td>
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<tr>
<td>INFO 3100</td>
<td>Automating Business Processes</td>
<td>4</td>
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<tr>
<td>INFO 3140</td>
<td>Foundations of Information Management</td>
<td>4</td>
</tr>
</tbody>
</table>

**Electives**

Select eight credits of INFO coursework

**Total Credits**

24

¹ BSBA and BSAcc students take INFO 1010 and INFO 2020 as part of the business core.
Information Technology

Minor Requirements

The Information Technology minor is available only to students pursuing a major in the Daniels College of Business.

Minimum 20 credits. Requirements include:

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<th>Code</th>
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<tbody>
<tr>
<td>INFO 3100</td>
<td>Automating Business Processes</td>
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<td>Foundations of Information Management</td>
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<td>INFO 3300</td>
<td>Data Warehousing and Data Mining</td>
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<td>INFO 3991</td>
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</table>

INFO 1010 Analytics I: Data Management and Analysis is a pre-requisite to beginning the minor. Students take this course as part of the business core.

Statistics

The Statistics minor is available to all traditional DU undergraduate students.

Minor Requirements

Minimum 20 credits. Requirements include:

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<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>INFO 1010</td>
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<td><strong>Select three of the following courses:</strong></td>
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<td>Analytics III: Business Modeling and Analysis</td>
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<td>INFO 3100</td>
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<td>INFO 3200</td>
<td>Business Forecasting and Visualization</td>
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<td>Topics in Business Analytics</td>
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<td><strong>Total Credits</strong></td>
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BSBA and BSAcc students take INFO 1010 and INFO 2020 as part of the business core.

Requirements for Distinction in the Major in Business Information and Analytics

Upon reaching 90 credit hours completed, students with a 3.50 cumulative GPA or higher, and a 3.85 Daniels GPA or higher, are invited to either create a portfolio of in-depth business experiences or to write a thesis to earn Distinction. See Daniels Undergraduate Programs or faculty in the department for more information.

This course plan is a sample schedule. Individual course plans will vary based on incoming transfer credit, admission path to Daniels, prerequisites, availability of courses, minors, and other scheduling factors. Please meet with your Daniels academic advisor to develop an individual graduation plan for your specific needs.

First Year

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<tr>
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### Foreign Language

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### Second Year

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<td>INFO 3400</td>
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<td>INFO Elective</td>
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<td>INFO 3440</td>
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<td>INFO Elective</td>
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**Total Credits: 189-190**

1. Analytical Inquiry: The Natural and Physical World
2. Scientific Inquiry: Society and Culture
3. INTZ 2501 is required for any student who studies abroad, and may be taken in any quarter within the year prior to studying abroad.

### Business Information Analytics Courses

**INFO 1010 Analytics I: Data Management and Analysis (4 Credits)**

The amount of data businesses are able to maintain and process is growing exponentially, and the ability to manage that data successfully can give a business a tremendous competitive advantage. This course introduces the student to the business data landscape, as well as basic data management and analysis skills through spreadsheet and database applications. Student projects focus on data collection, data cleansing and mining, statistical and graphical analysis, basic modeling, and written presentation skills. No prerequisites.

**INFO 1011 Microsoft Office Certification I Lab (0 Credits)**

Learning lab and exam with successful completion resulting in award of formal Microsoft Office certification for Excel. BSBA/BSACC degrees only. Prerequisites: INFO 1010.

**INFO 1020 Analytics II: Business Statistics and Analysis (4 Credits)**

Businesses can never have perfect information; therefore, they must employ statistical techniques to improve the decision-making process. This course introduces students to the basic tenets of probability and statistics, with an emphasis on business applications. Statistical models as decision-support tools are taught. Student projects focus on data collection, data analysis, decision analysis, and written presentation skills. Prerequisites: INFO 1010, MATH 1200, or MATH 1951 and MOS Excel certification.

**INFO 1021 Microsoft Office Certification II Lab (0 Credits)**

Learning lab and exam with successful completion resulting in award of formal Microsoft Office certification for Word and PowerPoint. BSBA/BSACC degrees only. Prerequisites: MATH 1200 or MATH 1951 and STAT 1400 or INFO 1020.

**INFO 2020 Analytics III: Business Modeling and Analysis (4 Credits)**

Businesses make decisions and improve processes using a variety of modeling and analytic techniques. This course introduces the student to the techniques of multiple regression analysis, time series analysis, optimization, and simulation for solving a variety of business problems. Applications include economic forecasting, supply chain management, and project management. Student projects focus on using spreadsheet modeling for problem solving, and emphasizes written and oral presentation techniques. Prerequisites: INFO 1020 and all MOS certifications.

**INFO 3100 Automating Business Processes (4 Credits)**

This course focuses on using Microsoft Excel to support decision making for managers. This course covers advanced Excel functions and menu options along with basic spreadsheet modeling design and good practices. It also covers automating tasks in Excel using VBA and creating Excel Add-in programs. We finish the class by covering object oriented programming such as Visual Basic. Prerequisite: INFO 1020 and DCB checkpoint 2.
INFO 3110 Applied Nonparametric Statistics (4 Credits)
This course introduces students to the basic statistical techniques one employs in reporting the results of surveys or in analyzing randomly collected data. We have all taken surveys seeking our opinions about various topics; the course evaluations we fill out at the end of each course we take is an example. Non-parametric statistics has become increasingly more important in analyzing data and reporting results. Our course is very applied in nature.

INFO 3140 Foundations of Information Management (4 Credits)
This course introduces the student to database management systems. Specifically, this course focuses on database theory, appropriate database design, modeling tools, and the practical issues of implementation and management. This course consists of four primary components (or modules): (1) database theory, (2) database design tools and techniques (ERD’s), (3) Structured Query Language (SQL), and (4) applying database concepts (using Microsoft Access). Corequisite: INFO 3100. Prerequisite: INFO 1020.

INFO 3200 Business Forecasting and Visualization (4 Credits)
This course explores the concepts of business forecasting and visualizations of business data. It covers the concepts of forecasting and visualization terminology along with all the steps of the forecasting process: define goal, get data, explore & visualize series, pre-process data, partition the data series, apply forecasting method(s), evaluation and compare performance, implement the forecasts/system, and communicate the results. This course also covers the creation and interpretation of real-time business data in terms of dashboards and scorecards. Prerequisite: INFO 2020 and DCB checkpoint 2.

INFO 3240 Enterprise Information Management (4 Credits)
This is the second in the series of two courses designed to expose students to database management systems. This course focuses on advanced topics in database theory, SQL, and an introduction to an enterprise database system using Microsoft SQL server and an integrated development environment using Visual Studio. Prerequisite: INFO 3140.

INFO 3300 Data Warehousing and Data Mining (4 Credits)
Data warehouse components and construction, extraction, transforming, and loading (ETL) and data cleansing, predictive analytics (trees, neural networks), descriptive analytics (drillable/OLAP reports, published reports, SQL queries), cluster and association modeling. Prerequisite: INFO 3240.

INFO 3340 Project Management and Simulation (4 Credits)
Students examine the science, practice the art, and discuss the folklore of project management to enable them to contribute to and manage projects as well as to judge when to apply this discipline. They explore the critical chain approach and probability distributions versus point estimates. Monte Carlo simulation modeling is also covered to explore the benefits and limitations of simulation as a tool for solving business problems, and to present students with the opportunity to build, analyze, and report on Monte Carlo simulations. Prerequisite: INFO 2020 and DCB checkpoint 2.

INFO 3350 Statistical Computing (4 Credits)
This course will provide the student with a base of skills necessary to program in one or more common scripting software packages. No prior programming knowledge is required. After completion of the course the student will be able to independently perform most basic statistical procedures using either software package. The student will also have the tools necessary to learn advanced topics from the software package documentation by themselves. Prerequisites: INFO 1020.

INFO 3377 Database-Driven Websites (4 Credits)
The programming course provides an in-depth look at the main techniques surrounding the development of dynamic web applications. This intensive lab/lecture course offers a detailed look at building a database-driven website. Databases are not new, but designing and applying them in a web environment presents new challenges, as well as new opportunities for data exploration. Students conceive, build and deploy a website using a database as its core. Topics include: creating database-geared pages with HTML, CSS, and ASP; using SQL combined with modeling languages to build web database schemas, and interfacing the website via VBScript (or JavaScript) and ADO. Prerequisite: INFO 3140.

INFO 3500 Capstone/Senior Project (4 Credits)
This course gives the student an opportunity to apply the knowledge and skills learned in this program to a real-world problem submitted by a partner business. Students take a business problem from problem definition, data collection, and model construction, through analysis and presentation of results to recommendations for specific business decisions. Prerequisite: INFO 3340.

INFO 3700 Topics in Business Analytics (1-4 Credits)
Exploration of various topics and issues related to timely analytics applications. Prerequisites: DCB checkpoint 2.

INFO 3980 Internship (0-10 Credits)
Internship; requires written report.
INFO 3991 Independent Study (0-4 Credits)
Independent research/study; requires written report.

INFO 3992 Business Analytics Directed Study (1-10 Credits)

Info Tech E-Commerce Courses

ITEC 3155 Database for Financial Applications (4 Credits)
In this course, you will explore databases and other information systems used in financial applications. You will learn to build and to document a small financial database. You will learn to read and interpret entity-relationship diagrams and process flowcharts. You will also gain an understanding of many of the topics covered in the Business Environment Concepts portion of the CPA exam.

ITEC 3325 Emerging Technologies (4 Credits)
This course is for students who want a strategic edge: to understand how the advanced information technologies that are emerging today will impact business in the near to medium future. This course will equip students with an understanding of the key information technologies central to the knowledge economy, their current and prospective business uses, and lifelong skills in how to think about business uses of these technologies - to identify, critically analyze, and evaluate them. This course is for students who want to become key players in the coming economy by combining substantial understanding of the technology side with substantial understanding of the business side – applications and strategy. Prerequisites: Degree checkpoint 2.

ITEC 3377 Introduction to Business Intelligence (4 Credits)
Corporate decision making and tools that support this process, including database theory, database design, the decision process, data warehousing fundamentals, data mining, decision support systems (DSS), decision support and data warehousing tools, the impact of e-business and e-commerce, and DSS in support of customer relationship management (CRM). This course will consider the practical issues of analysis, selection, implementation and management of these systems, and will incorporate a hands-on component using current data warehousing tools and technology. Prerequisite: ITEC 3485 and degree checkpoint 2.

ITEC 3378 Data Warehouse & Managing Enterprise Data (4 Credits)
This course is focused on the process of creating a data warehouse. The process includes requirements definition, design, modeling, establishing an architecture, integration, data conversion, data cleansing, and ETL (Extraction, Transformation, and Loading). Cross listed with ITEC 4378. Prerequisites: ITEC 3377 and degree checkpoint 2.

ITEC 3379 Data Warehouse and Business Intelligence III (4 Credits)
This course is focused on the process of corporate decision making and the tools that support this process. Early DSSs in support of customer relationship management have made strides in focusing on the support of the strategic decision making process. Through business intelligence tools, this process is becoming a science in itself. This course focuses on this emerging science. Prerequisites: ITEC 3378 and degree checkpoint 2.

ITEC 3380 Data Warehouse and Business Intelligence IV (4 Credits)
This course is focused on the overall process of creating a data warehouse from requirements through implementation. The format is that of a Practicum course designed to have each student build a small data warehouse or to build a component of a larger data warehouse in conjunction with a group. Prerequisites: ITEC 3379 and degree checkpoint 2.

ITEC 3410 Information System Analysis (4 Credits)
Current theory and approaches to information systems analysis, focusing on the development of requirements from the perspective of classes and objects found in the vocabulary of any domain. Prerequisites: ITEC 3540, ITEC 3475 and degree checkpoint 2.

ITEC 3420 Information System Design (4 Credits)
Design methods that encompass the process of information system design decomposition and a notation for depicting both logical and physical as well as static and dynamic models of the information system under design. Prerequisites: ITEC 3410 and degree checkpoint 2.

ITEC 3700 Topics in Information Technology and E-Commerce (1-4 Credits)
Topics vary each term. View the Schedule of Classes for specific information on topics.

ITEC 3810 Networks & Telecommunication (4 Credits)
Examination of network-enabling technologies and concepts, including LANs and WANs. Network design management and trouble-shooting issues are covered. Network design in the age of the Internet is emphasized, including intranets, extranets, design issues, security and firewalls. Pros and cons of private networks, including virtual private networks and discussed. Alternative technologies such as wire line, wireless, satellite and cable are covered. Cross listed with ITEC 4320. Prerequisites: Degree checkpoint 2.

ITEC 3840 Practicum (1-4 Credits)
Faculty supervised work experience. Instructor approval required.

ITEC 3980 Internship (1-5 Credits)
Practical experience (field study); requires written report. Instructor approval required.

ITEC 3991 Independent Study (1-8 Credits)
Independent research/study; requires written report. Instructor approval required.

ITEC 3992 Directed Study (1-4 Credits)

Statistics Courses