DATA SCIENCES AND OPERATIONS
Undergraduate Elective Courses

DSO Undergraduate Elective Courses

**090 401 Business Information Systems - Spreadsheet Applications**
(2 units, Fall and Spring)

This course is designed to provide students with an applied understanding of how spreadsheet applications are used to analyze business information. This course provides an opportunity for students to master the use and design of "Microsoft Excel" for business information analysis in the areas of Finance, Information Systems, Modeling and Operations. This course will also enhance students' understanding of the core business discipline by providing them with the skills and experience to develop, test and analyze business cases, to increase the effectiveness in the corporate decision-making processes. This course is a hands-on course and is a must have course for internship and job.

**090 402 Business Information Systems - Database Applications**
(2 units, Spring)

Through lectures and labs, students will learn how to design, develop, and utilize the database that businesses employ in inquiry reporting and decision making environments. Using Microsoft Access, students will learn the basics of normalizing a database, creating and selecting tables, creating user interfaces through the use of forms and macros, extracting and analyzing data, and mathematically manipulating information through queries, and managing business reports. The course consists of weekly instructor led database assignments and a final database project developed by the student.

**090 404 Business Forecasting and Business Intelligence**
(2 units, Spring)

Forecasting in today's business world is becoming increasingly important as firms focus on increasing customer satisfaction while reducing the cost of providing products and services. Businesses almost almost always depend on forecasts about the course of events. Virtually every area of business makes use of some type of forecast. In business forecasting, time series models, are useful statistical tools that are collected sequentially over time. A primary goal of these tools is to exploit the correlation structure of the observations in order to predict future values. This course is intended for students wishing to enter the field of economics, business, marketing, production, operations research, international trade, accounting, etc., who want a non-technical introduction to applied time series econometrics and forecasting (optimization), and financial modeling. In addition to spreadsheet modeling, students will learn industry expectations for quantitative analysis and practice this communication skills necessary to thrive organizational change.

**090 405 Business Information Systems - Spreadsheet Applications**
(2 units, Fall and Spring)

Through lectures and labs, students will learn how to design, develop, and utilize the database that businesses employ in inquiry reporting and decision making environments. Using Microsoft Access, students will learn the basics of normalizing a database, creating and selecting tables, creating user interfaces through the use of forms and macros, extracting and analyzing data, and mathematically manipulating information through queries, and managing business reports. The course consists of weekly instructor led database assignments and a final database project developed by the student.

**090 406 Business Forecasting**
(2 units, Spring)

Forecasting in today's business world is becoming increasingly important as firms focus on increasing customer satisfaction while reducing the cost of providing products and services. Businesses almost almost always depend on forecasts about the course of events. Virtually every area of business makes use of some type of forecast. In business forecasting, time series models, are useful statistical tools that are collected sequentially over time. A primary goal of these tools is to exploit the correlation structure of the observations in order to predict future values. This course is intended for students wishing to enter the field of economics, business, marketing, production, operations research, international trade, accounting, etc., who want a non-technical introduction to applied time series econometrics and forecasting (optimization), and financial modeling. In addition to spreadsheet modeling, students will learn industry expectations for quantitative analysis and practice this communication skills necessary to thrive organizational change.

**090 407 Designing Spreadsheet-Based Business Models**
(4 units, Fall)

Using MS Excel, we will learn to design spreadsheet models to solve managerial challenges in many industries and functions. The course features structured frameworks to address uncertainty (Monte Carlo simulation), risk analysis (Decision Trees), resource allocation (optimization), and financial modeling. In addition to spreadsheet modeling, students will learn industry expectations for quantitative analysis and practice this communication skills necessary to thrive organizational change.

**090 408 Essentials and Digital Frontiers of Big Data**
(4 units, Fall)

An overview of key concepts of big data and related digital technologies and their applications to different business problems. Hands-on experience at introductory level.

**090 411 Foundations of Digital Business Innovation**
(4 units, Fall)

This course, using company cases and lab experiences will help students with NO PREVIOUS TECHNICAL EXPERIENCE to help companies strategically use new technologies for their competitive advantage. Technologies covered: Web 2.0 (like mashups), Open Innovation (like crowdsourcing), Fast internal and external website creation for Knowledge sharing, Big data and business intelligence (like Tableau, Qlikview), Enterprise Resource Planning Systems (like SAP), Different forms of cloud computing (like internal-off-thes, SaaS, PaaS, and IaaS), Crowdcustomery (like Gotie), Customer Relationship Management Systems (like Salesforce.com), and corporate use of social networking (like Facebook for business.

**090 433 Business Process Design**
(4 units, Fall)

Gain skills to be an advocate or systems analyst as a career or part of management consulting by learning how to analyze business processes to identify improvement opportunities, develop use cases for the information systems design to support improved business processes, develop business cases for capturing managers of the need for process change, become a liaison between business and technology, vendors and developers, and manage the change process to meet user and business needs (4 MID 5000).

**090 435 Enterprise Data Architecture**
(4 units, Fall)

Database architectures and environments have become the foundation of most business information systems. Efforts to support Data Analysis (DA) and Business Intelligence (BI), Customer Relationship Management (CRM), increased reliance on BI tools / platforms (e.g., Jaspersoft, Birt, etc.), trending business data in customer/retail channels with big data software, will employ lectures, case studies, guest speakers from entertainment and media industry. This course will focus on the traditional entertainment and media industries and focus on the new emerging digital media and entertainment industry. The course includes the entertainment and media industries and focus on the new emerging digital media and entertainment industry. The course uses an overview of key concepts of big data and related digital technologies and their applications to different business problems. Hands-on experience at introductory level.

**090 443 Current Trends in Digital Business Models**
(4 units, Irregular)

This course is designed for undergraduates interested in a business career in the new emerging digital media and entertainment industry. This course includes the entertainment and media industries and focus on the new emerging digital media and entertainment industry. Interactive case studies for convincing managers of the need for process change, become a liaison between business and technology, vendors and developers, and manage the change process to meet user and business needs (4 MID 5000).

**090 445 Introduction to Big Data**
(4 units, Fall)

This course is designed for students interested in a business career in the new emerging digital media and entertainment industry. The course includes an overview of key concepts of big data and related digital technologies and their applications to different business problems. Hands-on experience at introductory level.

**090 447 Business Process Design**
(4 units, Fall)

Gain skills to be an advocate or systems analyst as a career or part of management consulting by learning how to analyze business processes to identify improvement opportunities, develop use cases for the information systems design to support improved business processes, develop business cases for capturing managers of the need for process change, become a liaison between business and technology, vendors and developers, and manage the change process to meet user and business needs (4 MID 5000).

**090 449 Principles of Data Management**
(4 units, Fall)

The course covers the fundamentals of data management including databases, data models, and data access. The course covers the fundamentals of data management including databases, data models, and data access. The course covers the fundamentals of data management including databases, data models, and data access. The course covers the fundamentals of data management including databases, data models, and data access. The course covers the fundamentals of data management including databases, data models, and data access.
DSS Undergraduate Course Descriptions

DSO 435 Project Management (3 units, Fall)
This course introduces important behavioral and analytical tools for managing complex projects. The behavioral skills focus on organizing, planning, and controlling projects and managing teams, risks and resources to produce a desired outcome. The course also covers analytical tools to perform quantitative trade-offs and make decision under uncertainty. The course is designed to help students develop the skills to become effective managers, students are taken through the entire process of project management from a strategic planning, monitoring and control of projects, and termination as to provide an opportunity for students to participate in a hands-on project that uses commercial software to design and develop a business process. The course is open to all students from all fields of study and aims to prepare students for the workplace.

DSO 436 Managing a Small Business on the Internet (3 units, Fall and Spring)
This course focuses on the management and implementation of supply chain processes and performance. It will be valuable for students who would like to manage a company or have a business where the Internet is an essential component. Students will learn the basics of deep learning technologies as well as some state-of-the-art applications. In particular, deep learning has become the driving force of AI research, and startups. In particular, deep learning has become the driving force of AI research, and startups. This undergraduate elective course, which was created in collaboration with industry partners, provides an introduction to deep learning with a focus on business applications. It will help students learn the basics of deep learning and AI development as well as some state-of-the-art applications. The course will feature high-impact courses as well as entrepreneurial projects and the development of new business applications. The course will be valuable for students with strong interests in future career or graduate program in business analytics.

DSO 437 Python Programming for Business Analytics (4 units, Spring)
This course introduces Python as a tool for solving business problems and making data-driven decisions. We develop computational thinking principles through important programming concepts such as variables and data structures, conditional statements, loops, functions, and object-oriented programming. We also utilize the Pandas module to analyze and visualize data. Through hands-on and student projects, students gain exposure to real-world data in various business domains, including retail, service, transportation, education, and public sector.

DSO 438 Essentials of Business Data Analytics Using R (4 units, Spring and Fall)
This is one of the most popular open-source programming languages for data and business analytics. Learn how to use it to download real-world data, manipulate data sets from various sources, manage the information, produce high-quality charts, and summaries. This course uses a small group-oriented approach. The course uses hands-on exercises to teach students practical ways of solving problems. You will learn the basics of computing, as well as general algorithms. You will complete the course with an individual project where you will use R to develop business applications outside the classroom. The course will be valuable for students in all industries.

DSO 439 Deep Learning and Business Applications (4 units, Spring)
This course is designed to prepare students for the workplace. The course introduces students to deep learning and its applications in business and industry. The course will feature high-impact courses as well as entrepreneurial projects and the development of new business applications. The course will focus on developing deep learning skills and understanding some of the hottest developments in the area of AI.

DSO 443 Current Trends in Digital Business Models (4 units, Spring)
This course is designed to prepare students for the workplace. The course introduces students to digital business models and their applications in business and industry. The course will feature high-impact courses as well as entrepreneurial projects and the development of new business applications.

DSO 445 Essential Courses (6 units, Fall and Spring)
This area of study prepares students for a variety of business careers. These courses are designed to provide students with the essential business skills needed to succeed in the workplace.

BUSINESS ANALYTICS:
1) DS0-401: Business Information Systems — Spreadsheet Applications
2) DS0-424: Business Forecasting
3) DS0-427: Designing Spreadsheet-Based Business Models
4) DS0-443: Current Trends in Digital Business Models
5) DS0-455: Project Management

Supply Chain Management:
1) DS0-482: Supply Chain Management
2) DS0-483: Operations Consulting
3) DS0-484: Business Forecasting
4) DS0-485: Managing a Small Business on the Internet
5) DS0-486: Supply Chain Management

Essential Courses:
1) DS0-401: Business Information Systems — Spreadsheet Applications
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6) DS0-482: Supply Chain Management
7) DS0-483: Operations Consulting
8) DS0-484: Business Forecasting
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10) DS0-486: Supply Chain Management

DSO 445 Essential Courses (6 units, Fall and Spring)
This course is designed to prepare students for the workplace. The course introduces students to deep learning and its applications in business and industry. The course will feature high-impact courses as well as entrepreneurial projects and the development of new business applications. The course will be valuable for students with strong interests in future career or graduate program in business analytics.

DEPARTMENT OF DATA SCIENCES AND OPERATIONS Undergraduate Areas of Interest for Electives

The DSS Department offers courses that prepare students with the skills to specialize in one or more areas of interest. • Business Analytics, for business analytics-savvy professionals in all industries; • Project and Program Management, for project/program management jobs in all industries; • Technology Strategy Consulting, for IT/technology professionals at all levels. The focus of the course is on developing skills to analyze and interpret data science-related information in a wide variety of business contexts.

DSO 431: Foundations of Digital Business Innovation
DSO 443: Current Trends in Digital Business Models
DSO 445: Essential Courses
DSO 455: Project Management
DSO 462: Managing a Small Business on the Internet
DSO 483: Operations Consulting

DSO 499: Managing a Small Business on the Internet (4 units, Spring)
This course is designed to prepare students for the workplace. The course introduces students to deep learning and its applications in business and industry. The course will feature high-impact courses as well as entrepreneurial projects and the development of new business applications. The course will be valuable for students with strong interests in future career or graduate program in business analytics.

DSO 499: Python Programming for Business Analytics (4 units, Spring and Fall)
This course introduces Python as a tool for solving business problems and making data-driven decisions. We develop computational thinking principles through important programming concepts such as variables and data structures, conditional statements, loops, functions, and object-oriented programming. We also utilize the Pandas module to analyze and visualize data. Through hands-on and student projects, students gain exposure to real-world data in various business domains, including retail, service, transportation, education, and public sector.

DSO 499: Essentials of Business Data Analytics Using R (4 units, Spring and Fall)
This is one of the most popular open-source programming languages for data and business analytics. Learn how to use it to download real-world data, manipulate data sets from various sources, manage the information, produce high-quality charts, and summaries. This course uses a small group-oriented approach. The course uses hands-on exercises to teach students practical ways of solving problems. You will learn the basics of computing, as well as general algorithms. You will complete the course with an individual project where you will use R to develop business applications outside the classroom. The course will be valuable for students in all industries.

DSO 499: Deep Learning and Business Applications (4 units, Spring)
This course is designed to prepare students for the workplace. The course introduces students to deep learning and its applications in business and industry. The course will feature high-impact courses as well as entrepreneurial projects and the development of new business applications. The course will focus on developing deep learning skills and understanding some of the hottest developments in the area of AI.

DSO 499: Essential Courses (6 units, Fall and Spring)
This area of study prepares students for a variety of business careers. These courses are designed to provide students with the essential business skills needed to succeed in the workplace.

BUSINESS ANALYTICS:
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3) DS0-427: Designing Spreadsheet-Based Business Models
4) DS0-443: Current Trends in Digital Business Models
5) DS0-455: Project Management
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