Decision and System Sciences
[Business Intelligence & Analytics – BIA]

Professors: Herschel (Chair), Klimberg, Robak (Emeritus)
Associate Professors: Gupta, Malhotra, Miori, Yi
Assistant Professors: Campbell, Clements, Kim, Mendoza
Visiting Instructors: Boyle, Chen, Evangelista
Administrative Assistant: Lois Archibald

Learning Goals and Objectives Business Analytics & Intelligence Major

Goal 1: Students will be competent in the functional BI&A skills necessary for transforming data into actionable knowledge to enhance strategic business decisions.

Objective 1.1: Students will be able to manage data of any size.

Objective 1.2: Students will utilize data to develop quantitative models that facilitate organizational operations.

Objective 1.3: Students will learn techniques for performing data mining functions that can identify hidden patterns and rules.

Goal 2: Students will be competent in thinking critically and analytically in all business situations.

Objective 2.1: Students will be able to identify and minimize biases in data collection.

Objective 2.2: Students will learn how to correctly interpret BI&A results.

Objective 2.3: Students will demonstrate the ability to make intelligent choices regarding the efficient use of information technology and decision models.

Goal 3: BI&A Students will be competent communicators in the BI&A environment.

Objective 3.1: Students will exhibit competence in developing clear, effective written analytical and technological documents which highlight problem solving and resulting solutions.

Objective 3.2: Students will be able to communicate clearly and effectively in composing and delivering oral presentations to the target audience.

Goal 4: BI&A Students will be competent in applying the Ignatian Values.

Objective 4.1: Students will be able to weigh the ethics and the impact on society when confronted with a business decision making situation.

GEP
GEP Signature Courses (See Curricula): six courses
GEP Variable Courses (See Curricula): six to nine courses

Integrated Learning Component (ILC):

Required:
MAT 119 Applied Business Calculus [or higher]
ECN 102 Introductory Economics (Macro)

DSS BIA majors can take any one course from the following departments:

Political Science:
POL 111 Introduction to American Government and Politics
POL 113 Introduction to Comparative Politics
POL 115 Introduction to International Politics
POL 302 Modern Political Thought
POL 303 American Political Thought
POL 315 Government and Business
POL 352 Political Booms and Busts

Psychology:
PSY 100 Introductory Psychology
PSY 123 Psychology of Men and Women
PSY 212 Multicultural Psychology
PSY 230 Social Psychology
PSY 235 Psychology of Gender
Requirements for the Business Intelligence & Analytics [BIA] Major

Business Foundation: ten courses, including
ACC 101  Financial Accounting
ACC 102  Managerial Accounting
MGT 360  Legal Environment of Business
DSS 210  Business Statistics
FIN 200  Introduction to Finance
MGT 110  Essentials of Organizational Behavior
or
MGT 120  Essentials of Management
MKT 201  Principle of Marketing
DSS 200  Introduction to Information Systems
DSS 220  Business Analytics
BUS 495  Business Policy

Major Concentration: six courses
Required Core
DSS 315  BI & A Concepts and Practices
DSS 330  Database Management
DSS 420  Introduction to Data Mining
DSS 435  Advanced Business Analytics

Plus one of the following courses:
DSS 425  Analytics Cup
DSS 435  Advanced Business Analytics
DSS 460  Introduction to GIS
DSS 470  DSS Special Topics
ACC 412  Accounting and Consulting in the Global Economy (ACC majors only)
PMK 465  Advanced Pharmaceutical Marketing Research (PHM majors only)

BIA Courses
DSS 150 First Year Seminar 3 credits
See individual course listing.

DSS 200 Introduction to Information Systems (3 credits)
Information systems play a critical operational, tactical and strategic role in global businesses. Technology has both a direct and indirect impact on how firms do business, where they do business, and on the products and services they market. In this course, the dynamic and ongoing impact of technology on business operations is examined at the industry, corporate, and individual levels. Topics examined include technology’s effect on business processes, services, and products, the supply chain, customer relationship management, decision-making, knowledge management, communications, outsourcing, information security, and the ethical use of technology.

DSS 210 Business Statistics (3 credits)
This course covers probability concepts as well as descriptive and inferential statistics. The emphasis is on practical skills for a business environment. Topics include probability distributions, estimation, one-sample and two-sample hypothesis testing, inferences about population variances, and chi-square test of independence. Students will also become familiar with spreadsheet applications related to statistics and with statistical software. Prerequisite: Math Beauty Course

Other Courses
DSS 493  Independent Study I Majors only & permission of the Chair
DSS 494  Independent Study II Majors only & permission of the Chair
DSS 491  Internship I Majors only & permission of the Chair
DSS 492  Internship II Majors only & permission of the Chair

Requirements for the Business Intelligence & Analytics [BIA] Minor

Required Core
DSS 210  Business Statistics
DSS 220  Business Analytics
DSS 315  BI & A Concepts and Practices
DSS 330  Database Management
DSS 420  Introduction to Data Mining

Plus one of the following courses:
DSS 425  Analytics Cup
DSS 435  Advanced Business Analytics
DSS 460  Introduction to GIS
DSS 470  DSS Special Topics
ACC 412  Accounting and Consulting in the Global Economy (ACC majors only)
PMK 465  Advanced Pharmaceutical Marketing Research (PHM majors only)

HON 210 Business Statistics - Honors: Candles in the Dark-Illuminating Data (3 credits)
This version of “Business Statistics” is intended for Honors students. This course is intended for students who wish to have an enriched experience in Business Statistics. The goal is for each student to develop a high level of competency in solving practical problems in the business world and to lay a firm quantitative foundation for future study. Topics include: descriptive statistics, probability, discrete and continuous random variables,
sampling distributions, confidence intervals, and hypothesis testing. Heavy emphasis is placed on casework and team projects. Content is covered on a “need to know” format.

**DSS 220 Business Analytics (3 credits)**

Every organization, must manage a variety of processes. In this course the student will development an understanding of how to evaluate a business process. Additionally, the art of modeling, the process of structuring and analyzing problems so as to develop a rational course of action, will be discussed. The course integrates advanced topics in business statistics—linear and multiple regression and forecasting, production and operations management—linear programming and simulation, and project management. Excel software is used for problem solving. Prerequisite: DSS 210.

**HON 220 Business Analytics: Modeling Tools for Thinking (3 credits)**

This course is intended for students who wish to have an enriched experience in Quantitative Methods for Business. In this course the student will development an understanding of how to evaluate a business process. Additionally, the art of modeling, the process of structuring and analyzing problems so as to develop a rational course of action, will be discussed. The course integrates advanced topics in business statistics—two sample hypothesis testing, linear and multiple regression and forecasting, production and operations management—linear programming and simulation, and project management.

**Business Intelligence Courses**

**DSS 315 BIA Concepts & Practices**

This course is an introduction to various scientific viewpoints on the decision making process. Viewpoints covered include cognitive psychology of human problem-solving, judgment and choice, theories of rational judgment and decision, and the mathematical theory of games, and these topics will be focused in the field of Business Intelligence and Analytics, with systems theory as an overarching theme. Latest academic research and industry practice will be presented by guest speakers to motivate the topic an enhance learning.

**DSS 330 Database Management Systems (3 credits)**

The course provides an in-depth understanding of the database environment. Besides covering the important process of database design, this course comprehensively covers the important aspects of relational modeling including SQL and QBE. Students will be required to design and develop a database application using a modern fourth generation language system. Prerequisite: DSS 220 or Actuarial Science Major.

**DSS 420 Introduction to Data Mining (3 credits)**

This course focuses on the application of decision-making tools used to develop relationships in large quantities of data for more than two-variables. Comprehension of when to use, how to apply, and how to evaluate each methodology will be developed. This course will additionally provide an introduction to data mining tools. Data Mining consists of several analytical tools, such as neural networks, decision trees, evolutionary programming, genetic algorithms, and decision trees, used to extract knowledge hidden in large volumes of data. An understanding of how these data mining tools function will be developed so as to provide insight into how to apply these tools. Statistical and data mining software will be used. Prerequisite: DSS 220.

**DSS 425 Analytics Cup (3 credits)**

The Analytics Cup course is an annual competition in which teams will solve a real-world problem situation utilizing their Business Intelligence (BI) and/or Business Analytics (BA) skills. During the course, all the students will learn about new BI and BA techniques and software, such as Trade Promotion Optimization (TPO), text analytics, and optimization. Each team will dig deeper into the application of one or more these software packages to solve their real-world problem situation. The competition culminates where each team presents their solution to a panel of judges who select the SJU Analytics Cup Champions. Students must be either a DSS major or minor. Class size is limited to 30 students. Prerequisite: DSS 420.

**DSS 435 Advanced Business Analytics (3 credits)**

This course extends several of the foundation Business Analytics topics from DSS 220 to address more complex problem solving situations. Techniques to be covered are optimization models (linear programming, integer programming, non-linear programming and others), simulation models, optimization/simulation models, and decision analysis. These techniques will all be
presented in the context of real world problems. To improve the students' ability to develop such models, fundamental problem solving skills of modeling and process analysis will be developed. 

Pre-requisite: DSS 220

**DSS 470 DSS Special Topics I (3 credits)**
Content of this course varies to allow for ongoing changes to business intelligence and related fields. The instructor will provide the course description for a given semester. *Students may take this course without having taken DSS 220.*

**DSS 471 DSS Special Topics II (3 credits)**
Content of this course varies to allow for ongoing changes to business intelligence and related fields. The instructor will provide the course description for a given semester. *Students may take this course without having taken DSS 220.*

**DSS 460 – Introduction to GIS**
This course introduces students to Geographic Information Systems and Science (GIS) - a rapidly growing field concerned with examination, description, analysis, management, visualization, and mapping of geographic data. Topics covered include map design, geographic and projected coordinate systems, spatial data structures and models, spatial analysis, and more. Students will learn fundamental GIS techniques for spatial analysis using ESRI's ArcGIS software package. The course is computer-intensive though no computer programming background is required.