

MGT 6213 – Business Analytics for Managers ([Course Preview](#))

This course prepares students to understand business analytics and become leaders in their areas in business organizations. This course teaches the scientific process of transforming data into insights for making better business decisions. It covers the methodologies, issues, and challenges related to analyzing business data. It will illustrate the processes of analytics by allowing students to apply analytics algorithms and methodologies to business problems. The use of examples places business analytics techniques in context and teaches students how to avoid the common pitfalls, emphasizing the importance of applying proper business analytics techniques.

Learning Objectives:

1. Apply data analytics to business problems.
2. Develop and interpret appropriate analytics models, analyze data using business analytics software, and generate business insights.
3. Have a decent command of R.

Sample Topics

- Linear regression as a first step in analytics
- Treatment effects, experimental design, and the difference-in-difference estimator
- Classification techniques - Logistic regression, Decision trees
- Introduction to prediction

Optional Course Preparations

- [Learning R by Barton Poulson](#)
- [Statistics Foundations: The Basics](#)
- [Statistics Foundations: 2](#)
- [Statistics Foundations: 3](#)

MGT 6655 - Business Data Preparation and Visualization ([Course Preview](#))

Visualizing data is an important step in understanding data, exploring relationships, and “making a case.” With the abundance and relevance of data in almost any type of work, the ability to understand and interpret data has become an indispensable business skill. Data visualization has become a fascinating industry, but the ease of creating visualizations also means that there are many charts out there that are wrong, ineffective, or misleading. The goal of this class is to introduce principles and tools of data visualizations, and to help you create visualizations for two different but related purposes: (1) exploration; and (2) explanation / presentation. “Exploration” is about helping you or other stakeholders understand data and form an opinion, by creating simple charts or building a dashboard. “Explanation,” in contrast, is when you use visualizations to convey the results of your analysis in a succinct, convincing manner.

Learning Objectives

1. Identify the proper visualization for different use cases.
2. Prepare, clean, and transform data for visualization purposes.
3. Create visualizations using the tools covered in this class.
4. Use visualization tools effectively to explore data, such as creating a dashboard, and interpret what you see.
5. Use visualizations effectively to “make a case” or explain findings
6. Critique visualizations presented by others (pros, cons, and suggestions for improvement).

Sample Topics

- Exploring data patterns in Tableau
- Building interactive dashboards to monitor data changes
- Visualization principles
- Scripting/programming in R/Python to generate charts not available in Tableau/PowerBI

Optional Course Preparations

- [Excel Essential Training \(Office 365/Microsoft 365\)](#)

MGT 8813 – Machine Learning for Business

The pervasiveness of big data has enabled data-driven decision making for businesses. Machine learning is a powerful tool to find nontrivial patterns from a large amount of data. With the recent advancement in machine learning algorithms and techniques, it has become an essential tool to aid decision making, deliver managerial insights, and create new opportunities in a large variety of business contexts. This course introduces a series of popular machine learning techniques and their applications in solving business problems. It covers core concepts, algorithm designs, and programming implementation with real-world data and business examples. Through extensive demonstrations, exercises, and projects, it offers students hands-on experience of applying machine learning techniques to practical business problems. Discussing machine learning in business context equips students with a combination of cutting-edge analytics sophistication and a good sense of how to apply it for business insights.

Learning Objectives

1. Understand the common traits of machine learning algorithms and which settings each model is best equipped to handle
2. Implement a variety of unsupervised machine learning methods, including k-means clustering, collaborative filtering, and text mining
3. Understand and develop model-based learning, ranging from basic linear regression models to more advanced non-linear models
4. Design and implement classifiers using traditional machine learning methods such as decision trees and random forests
5. Build more complex classifiers using neural networks and deep learning
6. Be familiar with using the R programming language and various packages to implement different machine learning methods

Sample Topics

- Clustering Analysis
- Collaborative Filtering
- Linear and Non-Linear Models
- Decision Trees and Random Forests
- Neural Networks and Deep Learning
- Text Mining and Topic Modeling

Optional Course Preparations

- [Learning R by Barton Poulson](#)
- [Statistics Foundations: The Basics](#)
- [Statistics Foundations: 2](#)
- [Statistics Foundations: 3](#)

MGT 8823 – Analysis of Unstructured Data

The amount of data produced each day has grown exponentially over the last several decades, and much of this data is “unstructured” in the sense that requires considerable transformation before analysis is possible. In this course, students will then learn how to apply a variety of analytical procedures, such as those related to natural language processing (NLP) and machine learning, to transform this unstructured data into an analyzable form and then use this data to make informed business decisions. Students will learn the tools they need to transform data from sources such as web pages, social media posts, and narrative disclosures in firms’ financial reports to an analyzable form. Students will also learn how to analyze this data using techniques from natural language processing and machine learning, including the newest innovations in relying on deep learning models.

Learning Objectives:

- Formulate strategies for obtaining and organizing unstructured data and extracting information
- Analyze an empirical problem that requires unstructured data for analysis and identify an appropriate strategy to conduct such analysis
- Implement both fundamental and advanced techniques in natural language processing
- Evaluate the output of advanced analytics techniques related to natural language processing
- Compare and contrast the appropriateness of various techniques for a given analytical problem
- Proficiently code in Python

Sample Topics:

- Parsing markup language to extra information
- Bag of words text representation
- Word vectorization with Word2Vec
- Fine-tuning and classifying with BERT

Optional Course Preparations

- [Python Data Analysis](#)