

QUAN6600
Business Analytics for Managers
Summer 2015

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Office Hours: Monday and Wednesday, 12-2:30 pm, or by appointment

Course Textbooks:

Business Statistics, 3ed, Sharpe, De Veaux and Velleman, Pearson (2014).

Behind Every Good Decision: How Anyone Can Use Business Analytics to Turn Data into Profitable Insight, Piyanka Jain and Puneet Sharma, AMACOM (2014).

Useful Resources:

Data Science for Business, Provost and Fawcett, O'Reilly (2013).

Downloadable Book - [An Introduction to Statistical Learning](#) by James, Witten, Hastie and Tibshirani, Springer (2013).

Online Book - [Forecasting: principles and practice](#) by Hyndman and Athanasopoulos

Lecture resource website:

<http://spots.gru.edu/jgrayson/MBAAnalytics/Quan6600Lectures.htm>

Course Overview

Analytics can be defined as **the scientific process of transforming data into insight for making better decisions**. There are three generally recognized categories of business analytics: descriptive, predictive and prescriptive.

Most businesses start with descriptive analytics - the use of data to figure out what happened in the past. Descriptive analytics prepares and analyzes historical data and identifies patterns from samples for reporting of trends. It also makes comparisons to see if things are different.

Techniques such as data modeling, hypothesis testing, analysis of variance, visualization, and regression analysis largely reside in this space.

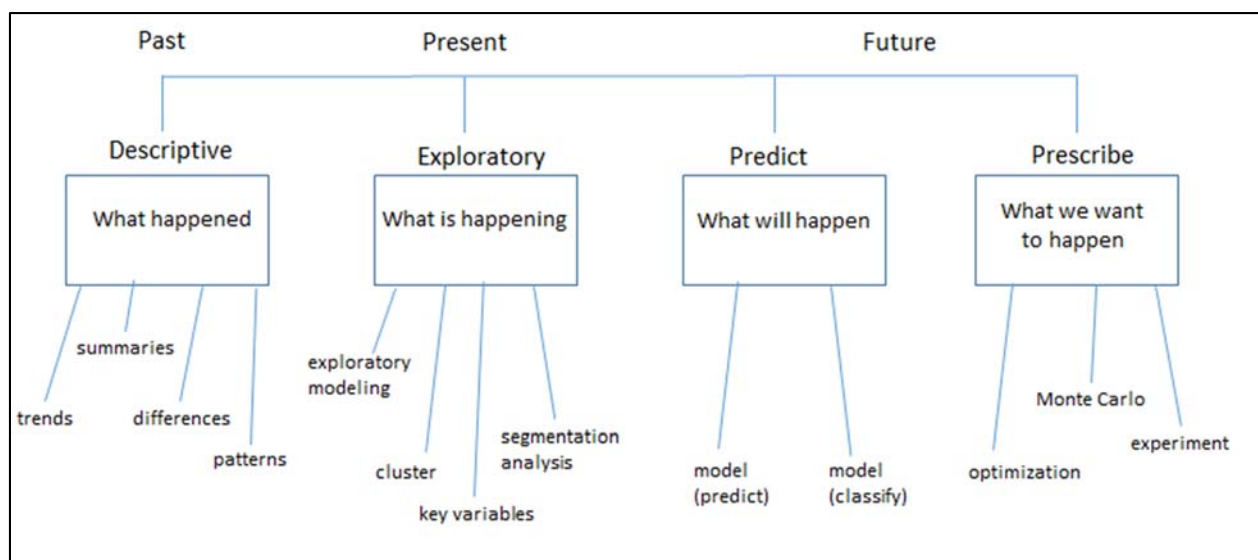
Predictive analytics uses data to find out what could happen in the future. It is a more refined and higher level usage of analytics. Predictive analytics predicts future probabilities and trends and finds relationships in data not readily apparent with traditional analysis, and includes techniques such as classification trees and logistic regression, along with time series analysis.

Prescriptive analytics uses data to prescribe the best course of action to increase the chances of realizing the best outcome. Prescriptive analytics evaluates and determines best ways to operate. Techniques include experimental design, optimization and simulation.

This course provides an overview of business analytics and addresses selected methods in each of the three categories of descriptive, predictive and prescriptive analytics in a practical, hands-on and business focused approach. In this course you will gain skills required to succeed in today's highly analytical and data-driven economy.

Learning Objectives:

1. express a business problem as a manageable analytical question
2. identify the appropriate data to address the question
3. select statistical analyses that help answer the question
4. select a best model from a set of competing models (predictive modeling)
5. translate complex statistical results into actionable business decisions



Course Elements:

Lab Problems

Following most lectures there will be a lab with an assigned lab deliverable. Lab assignments will be completed by student study groups of two or three students. Lab assignments will be submitted in two ways. The write up will be submitted as a hard copy in class. The associated JMP file will be submitted in the associated Dropbox for the lab.

Quizzes

There will be several online, timed, multiple trials quizzes to evaluate your comprehension of basic statistical methods and skills covered in an introductory statistic course.

Exams

There will be a comprehensive final take home exam.

Project

A comprehensive project providing the opportunity to apply knowledge and skills across a range of lectures will assigned during the last half of the semester.

A final project written report and project presentation will include an introduction (business motivation), methods (statistics you used), results (including measures of uncertainty), and conclusions (including potential problems). It should tell a story. *It should not include every analysis you performed.*

Reading Assignments

This is an individual assignment. The deliverable is a one to (not to exceed) two page executive summary of the article.

1. Part one is a concise summary of the key points in the article organized according to the major headings presented in the article.
2. Part two will be your “lessons learned” and “application” of the material presented.

Book Assignments

We will be reading through major portions of the Behind Every Good Decision book. For each reading assignment from the book you will write a one to two page executive summary addressing these key elements:

- Key Idea of Chapter(s)
- Summary of Main Points
- Lessons Learned

Journal

You will reflect on the topics and methodology covered in the course and identify the key learnings from the course and at least one way you can implement a specific idea from the class in your work setting.

You are required to journal the “lessons learned, principles and applications” of the material we cover. To help you remember key points you might choose to maintain make notes of key points on a weekly basis; however, what you turn in will be a synthesis of these key points, connecting them in an integrated whole and applying the insights to your current job. The grade will be based on my assessment of your ability to look beyond the details of what is covered in class and make connections in a broader perspective. It is *not helpful* to repeat what we covered in class, but rather to draw lessons learned and principles from what was covered.

Your journal should be organized as follows: paragraph one will summarize the key concepts explored, paragraph two will identify enduring principles and paragraph 3 will provide application of at least one principle to a current or anticipated job. The journal should not exceed two double spaced pages.

Criteria:

1. Does the journal move beyond what we covered in class to an integrated synthesis of concepts?
2. Are there principles identified that are also applied to specific job situations?
3. Does the journal meet the organizational guidelines?

Peer Evaluations

My intent is for peer evaluations (team feedback) to provide a less intimidating and less threatening way to initiate communication within your groups. Because you are required to provide feedback, and because I will then summarize (aggregate) that feedback and return a summary measure to the group, you are at the very least given the “opening” to deal openly, directly and honestly with group participation and contribution issues.

To provide some external incentive to allocate your time to achieve group goals and to do your part I will use the final team feedback peer evaluation average percent as a “factor” in deriving each individual’s final group lab grade and also final project grade. For example, suppose your group received a 95% across all the labs, and your overall (across all group members) peer feedback average percent is 90%, then your lab percentage will be $90\% \times 95\%$, or 86%.

Grading

Exam	35%
Quizzes	15%
Project	15%
Labs	20%
Reading Summaries (Articles and Book)	10%
Course Journal	5%

Business Analytics for Managers Course Topic Outline

Class*	Topic
1	Course Overview
	Introduction to Business Analytics
2	Data Exploration (Describing Data and Relationships)
3	Exploring Differences and Comparing Groups
4	Exploratory Analysis (Cluster; PCA)
5	Review of Simple Linear Regression
6	Multiple Regression & Model Building Part 1
7	Multiple Regression & Model Building Part 2
8	Predictive Modeling Concepts
	Multiple Regression Predictive Models
9	Logistic Regression Predictive Models
10	Evaluating Business Performance of Classification Models (cut-off values; Lift Curves)
11	Decision Tree Predictive Models
12	Advanced Tree Models
	Dimension Reduction Techniques and Strategies
13	Business Experimentation
14	Project
15	Project Presentations

Note: All classes include both a lecture and a lab component.

Please take time to familiarize yourself with relevant GRU policies affecting our course.

[Academic Conduct Policy](#)

[Attendance Policy](#)

[Accommodating Students with Learning Disabilities](#)

Testing & Disability Services

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