MG-GY-9753 Business Analytics (MOT)

Special Topics in Technology Management

Spring 2020

Course Description

Business analytics is a set of data analysis and modeling techniques for understanding business situations and improving business decisions. This course provides an introduction to business analytics concepts, methods and tools with concrete examples from industry applications. In the first part of the course, we will focus on descriptive analytics and exploratory data analysis concepts with a refresher on basic probability and statistics. In the second part, we will cover principles, techniques, and techniques for spatial data, time series, and text as data. The final part of the course will introduce a project that links business impact and modern data analytics techniques for managerial decision making in functional areas, including finance, marketing, and operations.

Throughout the course, we explore the challenges that can arise in implementing analytical approaches within an organization. The course emphasizes that business analytics is not a theoretical discipline: these techniques are only interesting and important to the extent that they can be used to provide real insights and improve the speed, reliability, and quality of decisions.

Pre-Requisites

Probability, Statistics, Linear Algebra, Excel

Instructors

JeanCarlo (J.C.) Bonilla, PhD, Adjunct Professor, jb3379@nyu.edu
Office hours: Tuesday's 4pm - 6pm

Sara Shi, Teaching Assistant, ss12370@nyu.edu

Required Textbook

HBR Guide to Data Analytics for Basic Managers. 2018

Suggested Textbook by Topic

R for Data Analysis in easy steps - R Programming essentials. Mike McGrath, 2018

R: Data Mining and Business Analytics with R, Johannes Ledolter, 1st Edition

Software

This course will require the use RStudio and Tableau

Grading Policy

- **Weekly Assignments - 30%**
    - Mostly data analysis and programming assignments. Some assignments will include theoretical aspects to make sure students understand the important mathematical concepts in data analytics.

- **Readings in Analytics & In-class Participation- 10%**
    - Weekly readings from HBR book as well as individual engagement.

- **Projects – 45%**
    - This is the capstone experience of the course where students will form groups consisting of between 3 and 4 people depending upon the size of class. Teams will build a project using a publicly accessible datasets. They will motivate the business problem, do enough explanatory analysis and generate data driven strategic insight. For each project, teams will provide a brief presentation on the project scope, data and methods utilized, findings, and business implications.
    - This course builds around 3 unique projects:
        - Project 1: Descriptive Analytics - 10%
        - Project 2: Predictive Analytics - 15%
        - Project 3: Final Project - 20%

- **Exam – 15%**
    - Two exams on covering theory and applications
        - Midterm Exam: 5%
        - Final Exam: 10%

For the purposes of computing GPAs, the following schedule is used.

Letter Grade	**100% Scale**	**Grade Point Value**
A	100-95	4.0
A-	94-90	3.7
B+	89-85	3.3
B	84-80	3.0
B-	79-75	2.7
C+	74-70	2.3
C	69-65	2.0
F	64-0	0

Course Web Page

You must have access to the NYU Classes site (http://classes.nyu.edu/). All announcements and class-related documents (supplemental and suggested readings, discussion questions, etc.) will be posted there.

Some class announcements will be distributed via NYU e-mail. Thus, it is important that you actively use your NYU e-mail account, or have appropriate forwarding set up on NYU Home (https://home.nyu.edu/).

In addition, lecture, data, and code will be posted in the following github repository https://github.com/jcbonilla/BusinessAnalytics

Statement of Academic Integrity

Students are expected to follow standards of excellence set forth by New York University. Such standards include respect, honesty, and responsibility. This class does not tolerate violations to academic integrity including:

- Plagiarism
- Cheating on an exam

- Submitting your own work toward requirements in more than one course without prior approval from the instructor
- Collaborating with other students for work expected to be completed individually
- Giving your work to another student to submit as his/her own
- Purchasing or using papers or work online or from a commercial firm and presenting it as your own work

Spring 2020 Course Schedule*

Module	Dates	Topics
Overview & Context	*Week 1*	Competing on Analytics in today's Business Landscape. The data lifecycle. Analytics vs. Intelligence vs. Data Science.
Descriptive Analytics	*Week 2 - 5*	Using R scripts, we will review concepts in descriptive statistics such as measures of central tendency, measures of dispersion, and measures of association between two variables. In this module we will cover the principles of hypothesis testing, correlations analysis, and statistical significance. In addition, this will be the first session on effective data visualization In addition, this module covers fundamentals of exploratory data analytics and Tableau. We will cover the approach and philosophy of Exploratory Data Analysis (EDA) for understanding business situations and improving business decisions
	Week 6	**Project 1 - Descriptive Analytics** Project presentations. Teams will have 10min to showcase a project using descriptive analytics
Exams	*Week 6*	**Midterm Exam**
Predictive Analytics	*Week 7-10*	This module covers the basics of regression analysis. Our emphasis will be on applications and interpretation of the results for making real life business/policy decisions and the mathematical and statistical properties of the techniques used to produce these results. In order to provide a broad intuition of the concepts and methods, we will use data and examples from marketing decision making such as segmentation, estimating market potential and forecasting demand, etc. We will continue covering regression analysis including non-linear transformations and dummy variables. In addition to advanced regression, we will cover prediction and classification trees. Finally, we will learn the principles of model selection, model performance, and operationalizing models.

	Week 11 *(Nov 12th)*	**Project 2 - Predictive Challenge** Project presentations. Teams will have 10min to showcase a project using predictive analytics
Special Topics in Analytics	*Week 12-13*	**Text Analytics** Using text as data presents an opportunity to move words into document-term-matrices that can be analyzed via statistical analysis. In this lesson we will cover text processing, analysis, and interpretations of summary statistics of a corpus
Final Project	*Week 14-15*	**Project Consultations** This session is dedicated to teamwork and preparation for project presentations. Together we will review project plans against actual progress and reposition project deliverables for the final analytical sprint. **Final Project** Project presentations. Teams will have 15min to showcase final projects
Exams	*Week 15*	**Final Exam**