1 Course Description:

This course is designed to be an introduction to the world of business analytics. We will explore the various uses of analytics as related to finance, decision making, and more. We will use Excel for much of our computation as well as some different languages including Python and R.

Prerequisite(s): None but a basic understanding of Statistics is preferred.

2 Course Overview:

This course will serve as an introduction to the discipline of data analytics as applied to business decision making. We will explore many methods and models in order to simulate scenarios in the world of finance, computer science, and much more.

In analytics, we are concerned with choosing and evaluating models in order to best obtain answers to the questions of the world around us. It is up to us to look into these models.

During this course, you will learn how to express computations (what we call algorithms and models) in the programming language R, Python and also using Microsoft Excel. The techniques you will learn in this course will be generally applicable for programming other languages such as Java, C and C++. This will be a fun course filled with discussion, readings, and projects.

By the end of the class, you will be able to

1. Express problems and solutions using the language of computers and mathematics.

2. Be able to identify and evaluate several methods and models in analytics.

3. Apply mathematics, science and engineering principles

4. Design and conduct experiments, analyze and interpret data
5. Design a system, component, or process to meet desired needs
6. Communicate Effectively
7. Use techniques, skills and modern engineering tools necessary for engineering practice

2.1 Course Objectives:
This is a hands-on class with much of class time spent on interactive activities designed to help you understand concepts of business analytics through exploration. This is not the "traditional" course where I will lecture you and then you go home and do a problem set because that type of course structure does not allow you to gain the course objectives for an analytics course. You will not be able to simply read the textbook and become well versed in the concepts of forecasting and programming. The type of problem solving skills required for this class can only be obtained by working through and solving problems both in and out of class. I will be asking you throughout this course to apply the concepts of algorithmic thinking in your homework, exams, etc.

The in-class activities will be very interactive and will sometimes require pair-based work in which you will be assigned various partners throughout the semester. We will go over the expectations in detail for pair-programming activities in class. It is imperative that you attend class and arrive on time.

2.2 Sample Topics to be covered
Below are samples of the topics that we will be covering (this list is not exhaustive)

1. Overview of Elementary Descriptive Statistics (standard deviation, variance, etc)
2. Application of Bernoulli, Poisson, Binomial Distribution
3. Confidence Intervals
4. Quantitative Finance
5. Hypothesis Testing (both parametric and non-parametric tests)
6. Comparing Random Variables
7. Regression (linear, log-linear, etc)
8. Introduction to Machine Learning / Artificial Intelligence

3 Course Logistics:
3.1 Grade Breakdown
Grading is dependent on weekly assignments, the Midterm, and the final project.

- Attendance: 10%
- In-class workshops: 20%
- Homework: 20%
• Midterm: 20%
• Final Project: 30%

3.2 Final Project:
The final project depends heavily on the experience you come into class with and the experience you leave with. I am expecting students from a wide spectrum of both fields and experience with analytics. The final project will consist of both a written part as well as an oral presentation. The project will focus on a set of data (either obtained by you or given by me). You may use any models or methods learned in class including but not limited to:
• Regression Analysis
• Descriptive Statistics
• Predictive Analytics
• Classification Techniques
• Python / R / Excel

but you must present some analysis of the given data as if you were presenting it to high level analysts and executives. Projects will be highly individualized based on each student’s level of experience and topics will vary wildly. For this reason, each student must ok their final project presentation with me by half way through the class.

3.3 Attendance and Absences
Attendance in lectures is mandatory but an occasional absence may be acceptable. There will be no make-up exams. If you have a valid excuse to miss an exam, you must provide a letter from the Office of Academic Advising verifying this. In this case, your grade for the exam will be the weighted average of your grades in the other exams. If you miss an exam without a valid excuse, your grade will be zero.

3.4 What I can expect from my students
• This is an upper-level class. I expect my students to pay both myself and the material respect.
• I expect all of you to designate the appropriate time to the assignments and to the material.

What you can expect from me
• You can all expect professionalism from me as we progress through the course.
• You can all expect a friendly professor. I love this material and I hope that you will all love it too.
Academic Honesty Policy Summary:
The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition.

1. Plagiarism of any type will not be tolerated. Even from notable figures in business analytics. This includes both code and analysis.

Report any violations you witness to the instructor. You can find more information about university misconduct policies on the web at these sites:

- For undergraduates: http://e-catalog.jhu.edu/undergrad-students/student-life-policies/
- For graduate students: http://e-catalog.jhu.edu/grad-students/graduate-specific-policies/

Special Aid:
Students with disabilities or other special needs who require classroom accommodations or other arrangements must make this known to me as soon as possible at the beginning of the semester, and be registered with the disability coordinator in the Office of Academic Advising.