**Fisher College of Business**

**The Ohio State University**

**Syllabus**

Business Adm 3630.05 – Introduction to Business Analytics

(3 Credit Hours)

Autumn Semester 2017

Instructor: Ralph Greco, BS. MS. Industrial Engineering

257 Mason Hall

[Greco.24@osu.edu](mailto:Greco.24@osu.edu)

(Office) 614-688-8090

(Cell) 614-286-3350

Class Schedule Tuesday Section #1 3:30 – 5:30 Schoenbaum 209

Tuesday Section #2 5:45 – 7:45 Schoenbaum 209

This course is the first in a two-course sequence that comprises the course requirement for students enrolled in the Fisher Business Analytics Cluster and which, when combined with other requirements, provides students with in-depth competence in Business Analytics business practices. This first course is a pre-requisite for enrollment in the second course in this sequence which will be offered during the Spring Semester. Instructional staff for this first course in the two-course sequence includes Faculty from the Fisher College as well as representatives from the sponsoring companies -- JPMC, Cardinal Health, Lane Bryant, and Saama Technologies.

*Learning Objectives*

1. To gain a basic understanding of Business Analytics and its applicability to various Industries
   1. Understand the fact from fiction in the current environment.
   2. What is Big Data and other terminology that is used in the marketplace today?
   3. Who are the current key players in Business Analytics?
2. Analytics within the Organization
   1. How do today’s organizations work with/utilize/take advantage of Analytics?
   2. What organizational change must take place for analytics to have an impact?
3. Critical Thinking and its place in Business Analytics
   1. Inductive vs Deductive Reasoning.
   2. Framing the question(s) needed by the business, that will then drive the data requirements
4. Working with the data
   1. Types and varieties of data
   2. Organization of data
5. Descriptive Analytics
   1. Understanding what the data are, and what it might be telling you
   2. Basic Tools for Descriptive Analytics
   3. Advanced Tools for Descriptive Analytics
6. Predictive Analytics
   1. Can the data provide us with insights as to future events, potential results?
   2. Basic Tools for Predictive Analytics
   3. Advanced Tools for Predictive Analytics
7. Prescriptive Analytics
   1. Next best action

*Course Overview*

The overall objective of the first course in the Business Analytics industry sequence is to familiarize the students with the concept of Data Analytics (Big Data) and its applicability in a business environment. This course will utilize both faculty from Fisher College as well as Corporate Executives from sponsoring companies and Analytics vendors. These individuals will lead discussions on various topics central to Analtyics.

At the end of the Fall semester, students should have acquired an understanding of Analytics – the terminology, concepts and familiarity of potential tools and solutions that exist today. This will not be an in depth study of modeling or optimization techniques, but when the two course sequence is completed, student should be better familiar with overall analytics tools/techniques and their use in corporate environments.

The course is a combination of lectures, case studies, individual assignments and a group project (teams of 3-4). Project and project workload are discussed later in the syllabus. Class interaction will be a key component of the overall grade, and students are expected to be prepared each week when they attend. It is assumed that each student will be familiar with basic technology (web search, etc.), have access to a computer (not an iPad), and have basic knowledge of statistics, and math. We will not be finding a solution for a quartic equation, but we will be discussing regression methods (linear, non linear, Bayesian). Be prepared accordingly.

All students are expected to maintain professionalism in their interactions with the external speakers. This includes interactions during their presentations, and in any outside classroom events (social or otherwise).

Students need to be ready to go each week in class. Discussions in class can only be fueled by those individuals that are ready to ask questions, provide feedback (non emotional) and defend their positions with logic and facts – just as you will have to do in a corporate environment.

There will be multiple opportunities/requirements for the student to present in class. This includes presenting to their peers, OSU Faculty and external speakers.

*Required Text*

“The Field Guide to Data Science (2nd Edition)” Booz, Allen, Hamilton

(to be provided by instructor as PDF)

**Course Mechanics**

*Grading*

Class Contribution 25%

Individual Presentations/Homework 25%

Fall Project 50%

*Attendance Policy*

Students are expected to attend all cluster activities and classes. Absences will be excused only in the case of health problems (doctor’s note required) or death in the family. Unexcused absence will result in reduction of points from the class contribution component of the grade.

*Cell Phone Use*

Absolutely no cell phone use in class whatsoever! During breaks or outside of classroom, no problem. Use of cell phone in the classroom will result in deduction of class contribution points.

*Computer or Tablet Use*

Only allowed in the classroom for presentations. All handouts and slides will be provided by the instructor during the first class or by the guest speaker (if they can share their slides) after their presentation. No laptops or tablets to be open in the classroom, use of either of these devices in the classroom will result in deduction of class contribution points.

*Projects, Case Studies*

The class will be divided into project teams at various points in the semester. Team Lead will be assigned by Instructor or Guest Lecturer.

*Class Contribution*

Obviously, given that class participation is 25% of the overall grade, each student should be “ready to go” each week. Guest lecturers will leave plenty of time at the end of their lecture/discussion for questions and as a result the students need to be actively listening and engaged during the presentation. Attendance will be taken each week.

*Academic Misconduct*

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct. <http://student.ife.osu.edu/csc/>

*Disability Services*

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone number is 292-3307, TDD is 292-0901; <http://www.ods.ohio-state.edu/>

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options.  You are also welcome to register with Student Life Disability Services to establish reasonable accommodations.  After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; [slds.osu.edu](http://slds.osu.edu/); 098 Baker Hall, 113 W. 12th Avenue.

*Fall Projects*

Each Fall, teams will be randomly created and assigned a project that either our Sponsors create or will be generated by FCOB Faculty. These projects get us ready for Sponsor projects in the Spring and provide a great learning experience. The Fall projects make up 50% of the overall grade and include multiple presentations in class and to external guests. Given the number of project teams in each class, it will be impossible to for teams to meet during class, instead, the assumption is that each team will meet for a minimum of 1 hour during the week to get ready for the key milestone presentations and final presentation. Each team will also sit with the class instructor each week during office hours for at least 10 minutes during the semester to present results and receive feedback.

Skills that will be learned during the project include those “soft skills” often asked about in interviews: project management, leadership, working in a team environment and conflict management and resolution.

Tentative Schedule for Fall Semester

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date | Lecturer | Topic | Learning Objective | Reading and Assignments |
|  |  |  |  |  |
| August 22 | Greco | Class Introduction and expectations.  Big Data and Analytics  Extra Credit Discussion | Review of the Course. Review of Syllabus. Class introductions by both instructor and the students. Discussion about the potential for extra credit.  Beginning discussion around Big Data and Analytics. | **Sponsor or Greco Projects – Teams Created, and Projects Assigned** |
| August 29 | Greco | Big Data and Analytics | Continued discussion around Big Data and Analytics, with examples from industry. |  |
| Sept 05 | Greco | Framing the Problem | Analytics starts (not always) with recognizing a problem or decision that needs to be made and begin the work to solve it. | **Read – pages 1 – 45 in the Field Guide to Data Science** |
| Sept 12 | Greco | Framing the Problem  Data  Statistics | Recognizing what data are required where that data reside (if at all) is another component. What will the data look like? How can it be collected? How is it managed? | **Assignment for Project – Problem Description** |
| Sept 19 | Greco | Descriptive Analytics | The first step, and sometimes the only step needed in Analytics is a great Descriptive Model.  In this section we will cover:  Visualization of Data  Descriptive Statistics  Probability  Sampling/Estimation | **Turn In -- Problem Description due by noon on Monday the 18th**  **Download Data Set for Chicago Crime Stats**  **Assignment – Visualization of Crime Data** |
| Sept 26 | Greco | Descriptive Analytics | Continuation of Descriptive Analytics  Visualization of Data  Descriptive Statistics  Probability  Sampling/Estimation | **Assignment – Excel Dashboard of Crime Data**  **Turn In – Visualization. Due Monday the 25th by noon.** |
| October 3 | Greco | Descriptive Analytics | Continuation of Descriptive Analytics  Visualization of Data  Descriptive Statistics  Probability  Sampling/Estimation | **Turn in – Excel Dashboard of Crime Data, due Monday the 2nd by noon.** |
| October 10 | **No Class** | | | |
| October 17 | Greco | Predictive Analytics | The Holy Grail for many companies is Predictive Analytics.  Predictive Models  Regression  Forecasting  (if time allows, Simulation) | **Turn In – Project Update, Due Monday the 16th by noon.** |
| October 24 | Greco | Predictive Analytics | Continuation of Predictive Analytics  Predictive Models  Regression  Forecasting | **Assignment – Regression Model of Crime Data** |
| October 31 | Greco | Prescriptive Analytics | The highest order of Analytics, that is, can I prescribe a course of action based on the data and model? | **Turn In – Regression Model of Crime Data** |
| Nov 7 | Greco | Communicating and Acting on Results | You had a question, built a model, and collected data. Great. Now what? How do you describe the results and convince others | **Read – Handouts**  **Turn In – Project Update, due Monday the 6th by noon.** |
| Nov 14 | Greco | Communicating and Acting on Results | Continuation of Communicating and Acting on Results |  |
| Nov 21 | No Class | | | |
| Nov 28 | Greco | Project Presentations |  | **Final Project Presentations due, Monday the 27th by noon. PDF format.** |
| Dec 5 | Greco | Project Presentations |  |  |

Attachment #1

Books that you should read at some point!

The Numerati. Stephen Baker. (2008)

Big Data. Viktor Mayer-Schonberger, Kenneth Cukier. (2012)

The Shallows. Nicholas Carr (2009)

The Drunkard’s Walk. Leonard Mlodinow. (2009)

You Are Not a Gadget. Jaron Lanier. (2010)

The Optimization Edge. Steve Sashihara. (2011)

The Signal and The Noise. Nate Silver. (2012)

The Big Switch. Nicholas Carr. (2013)

The Numbers Game. Chris Anderson, David Sally. (2013)

The Shock of the Old. David Edgerton. (2011)

To Save Everything, Click Here. Evgeny Morozov. (2013)

Predictive Analytics. Eric Siegel. (2013)

Antifragile: Things that gain from disorder. Nassim Taleb. (2013)

What to Expect When No Ones Expecting. Jon Last (2013)

The Information: A History, A Theory, A Flood. James Gleick. (XXXX)

Chaos: Making a New Science. James Gleick (XXXX)

Big Data, Analytics and the Future of Marketing and Sales. McKinsey (2013)

Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie or Die. Eric Siegel. (2013)

Moneyball. Michael Lewis. (2011)

The Age of Spiritual Machines: When Computers Exceed Human Intelligence. Ray Kurzweil. (2000)

Robopocalypse. Daniel Wilson. (2012)

Freakanomics. Steven Levitt. (2009)

Numbers Rule Your World. Kaiser Fung. (2010)

Thinking, Fast and Slow. Daniel Kahneman. (2011)

Naked Statistics. Charles Wheelan. (2013)

The New Know. Thornton May. (2009)

Chaos. James Gleick. (2008)

The Information. James Gleick. (2011)

Smart Cities. Anthony Townsend (2013)

Every Shot Counts. Mark Broadie (2014)

The New Science of Cities. Michael Batty (2013)

Final Jeopardy. Stephen Baker (2011)

Trading Bases. Joe Peta (2013)

Attachment #2

Glossary of Terms (ones to know!)

A/B Testing

Classification

Cloud Computing

Cluster Analysis

Crowdsourcing

Data fusion

Data Mining

Data Warehouse

Ensemble Learning

ETL (extract transform load)

Genetic Algorithms

Hadoop

Machine Learning

Mashup

Metadata

Network Analysis

NoSQL

Optimization

Pattern Recognition

Predictive Models

R

Regression

Sentiment Analysis

Signal Processing

Spatial Analysis

Spatial-Temporal Analysis

SQL

Statistics

Stream Processing

Structured Data

Unstructured Data

Visualization