Course Syllabus and Schedule*
410 Managerial Analytics, MEM Program, Winter Quarter 2016

Main Texts: 1.   Textbook: *Managerial Analytics.* Michael Watson and Derek Nelson. Pearson 2014
                  2.   Other material posted on on-line. We will leverage articles in the public domain.

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Course Description:

Analytics is a very hot topic. Davenport's book on *Competing on Analytics* started the movement by showing the tremendous value in analytics. He showed how firms can gain a competitive advantage by using data to make better decisions. Many different organizations, including businesses, governments, and non-profits, are now making significant investments in analytics.

However, as the analytics movement gains momentum, there is a danger that the term is not well-defined and is just being used as a buzzword. This is not helped by the popular business press, consultants, and vendors who use the term "analytics" for just a single aspect of the field, or, worse, use the term to just help repackage an old idea. The problem with the lack of definition is that organizations may be misled with their investments or miss out on more significant analytics opportunities.

Despite the confusion about the definition of analytics, it is not a fad. Analytics is here to stay. Data has become too valuable to ignore. And, analytics is the way to turn that data into better decisions.

The field is evolving quickly and, luckily, serious thinkers are converging on a definition that encompasses the wide range of different aspects of analytics:

- Descriptive Analytics to help you understand what has happened
- Predictive Analytics (including machine learning) to help you understand trends and predict outcomes
- Prescriptive Analytics to help you decide what action you should take

As a manager, you are going to need to harness many aspects of analytics and tailor it to your unique situation.

The objective of this course is to help you understand the field of analytics and be able to put analytics into a business / managerial environment. This will help you separate the hype from the reality, help you select the right projects for your organization, and to help you do analytics projects on your own.

We will cover the theory, what is new, and the practical applications for each of the different aspects of analytics. There will be ample opportunity for hands-on exercises. We will use case studies throughout the course from website design, to political campaigns, to orange juice manufacturing, to water supply, to cancer treatment, and so on. I want you to take ideas from this class and apply them to your everyday work.

This field will continue to evolve and you will have to be able to evaluate or propose many different analytics solutions. This course is meant to create a foundation for you to understand new definitions and new solutions, and be able to separate out the good from the bad and the new from the old.

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Teaching Method: Classes will be a mix of lecture, group discussion, and interactive computer exercises. The concepts will be reinforced with the text, case studies, additional readings, homework assignments and a course project.

Prerequisites: You will need a strong working knowledge of Excel and PC's in general. You should have access to MS Office for the homework assignments and case studies. You may need to download open source software during the course.

Evaluation: Grades will be based on homework (50%), a course project (25%), a final exam (15%), and class participation (10%).

Date	Topics Covered	Reading Prior to Class and In-Class Exercises	Home-work Due
1/7	Introduction to Analytics: Definition of Analytics (descriptive, predictive, and prescriptive); Big Data versus Analytics; Analytics trends and the industry trend of leveraging analytics	*MA*: Chapter 1 and 2 *Competing on Analytics*	
1/14	The Analytics Mindset: Deductive thinking versus inductive thinking; result-driven mindset; discrete analysis versus stochastic analysis; correlation versus causation and other analytics fallacies;	*MA:* Chapter 3 *Tide Basic Case Study* *Statistical Fallacies*	HW#1
1/21	The Role of Data: The value of understanding data; Structured data versus unstructured data; data technology and their impact to analytics	*Introduction to MS Access* *How Data Lake Works*	HW#2
1/28	Overview of Machine Learning: Common techniques (k-nearest neighbor, recommendation engines, decision trees, logistic regression, k-means, and association rules)	*MA:* Chapter 4 and 5 *Additional materials related to Weka*	HW#3
2/4	Guest Speaker: Modern Data Architecture. Descriptive Analytics: BI Systems; the power of de-averaging; visualization basics; descriptive analytics in action (dashboard, balanced scorecard etc.)	*TBD - Additional materials*	HW#4
2/11	Predictive Analytics: Statistics review (with a different take and for demand forecasting). Testing in more detail; Ensemble models using multiple algorithms; Power of structured thinking	*MA* Chapter 6 *TBD - Additional materials*	HW#5
2/18	Guest Speaker: Analytics in Driverless Cars. Prescriptive Analytics: Review of Optimization; the power of heuristics, approximately and holistic thinking; strategic decisions versus tactic decisions	*MA* Chapter 7 and 8 *TBD - Additional materials*	HW#6
2/25	Revenue Management / Functional Analytics: Analytics in Marketing, Supply Chain, Operations, Credit, Finance, Human Resources, IT	*MA* Chapter 9 *TBD - Additional materials*	HW#7
3/3	Making impact with analytics : Understand the 4Ps (Problem, Product, People & Process); Communicating Analytics; importance of structure; Growing into C-Suite	*TBD - Additional materials*	HW#8
3/10	Industry Week – NO Class		
3/17	Take Home Final Exam & Course Project Due: Project Presentation	You will submit your Final Exam individually, present and submit course project as a group	

The readings listed for each week should be completed prior to the class. The homework assignments are due at the beginning of the class. No homework assignments or case study write-ups will be accepted late.

The homework assignments will be a mix of problems, case studies, and write-ups. The point total (and therefore their relative importance) will vary from week to week. More details will be available closer to the course start date and due date of the homework.