OPMGT 579 – Business Analytics: Tools for Big Data  
Autumn Quarter 2015

Instructor Information

This course will be co-taught by Michael R. Wagner (first half: Sept 30 – Nov 2) and Hamed Mamani (second half: Nov 4 – Dec 9). Professor Wagner can be reached at mrwagner@uw.edu and his office hours are MW 12:30-1:30 (right after class) in Paccar 442, through November 2. Professor Mamani can be reached at hnamani@uw.edu and his office hours are TBD.

Course Description and Objectives

Business analytics is a set of techniques that enterprises use to gain insight from their data and make better decisions. Many firms in a variety of industries use these techniques: Google, Amazon, Target, Coca-Cola, WalMart, Capital One. These techniques are also applicable to the many functional areas of business, such as operations, marketing, accounting, finance, etc. Furthermore, the modern abundance of data, so-called “Big Data,” underscores the value that analytics can provide a firm, be it non-profit, for-profit, or government.

This course introduces business analytic techniques via a familiar spreadsheet environment. These techniques are drawn from machine learning, data mining, and optimization. Note that this is not a technical or theoretical course. We will focus on the application of these techniques to real business situations, with the aim of creating insight and value. The course is divided into six main modules:

1. Visualization  
2. Prediction  
3. Classification  
4. Clustering  
5. Optimization  
6. Projects

Our course goals are the following:

1. Students should be able to think critically about business analytics, which includes selecting the right type of analysis for a given task.
2. Students should be able to identify opportunities of applying business analytics, in real business settings.
3. Students should be well equipped to become data-savvy managers.

To achieve the above goals, lectures will cover the major concepts and analytical tools. Cases and practice problems will allow you to analyze different industry settings, analyze different company strategic problems, and identify key issues related to data and modeling.

Required Textbook

Data Mining for Business Intelligence: Concepts, Techniques, and Applications in Microsoft Office Excel with XLMiner. Shmueli, Patel, and Bruce. Wiley. 2nd Edition; 2010

Computer Software

Students are expected to be familiar with using Microsoft Excel software (e.g., modules 1-3 on the Excel for Business online course, available on canvas.uw.edu). We will be using Excel, the XLMiner add-in, and the visualization software Tableau. This software is available in the computer labs in Paccar 190. Student licenses to XLMiner and Tableau will be provided.
Cases

Most weeks a case will be assigned. Students are expected to work either individually or in groups on the cases. However, each student must submit his/her own solution. These assignments are due at the beginning of class on their posted due date and are electronically submitted through the class website on canvas.uw.edu.

Group Project

The final module of this course will consist of a group project where teams will apply the techniques of the course to real data. Further details will be released later in the course.

Grading

Student grades will be calculated applying the following allocation in a simple weighted average:

1. Case Analyses 60%
2. Project 40%

The (required) target median GPA in this class is 3.4 – 3.6.

Course Website

All course materials will be distributed electronically through the website canvas.uw.edu. Case assignments and (optional) exam supporting Excel documentation are submitted electronically through this website (by their due dates!).

CLASS SCHEDULE AND TOPICS
(subject to revision)

Wednesday, September 30, 2015
Introduction to Business Analytics
Reading: Chapters 1-2

Monday, October 5, 2015
Visualization: Types of Visualizations and Introduction to Tableau
Reading: Chapter 3

Wednesday, October 7, 2015
Visualization: Tableau Analysis, Dashboards and Stories
Reading: none

Monday, October 12, 2015
Prediction: Linear Regression
Reading: Chapter 6

Wednesday, October 14, 2015
Prediction: Nonlinear Regression
Reading: none

Monday, October 19, 2015
Classification: Logistic Regression
Reading: Chapter 10
Wednesday, October 21, 2015
Classification: Classification and Regression Trees (CART)
Reading: Chapter 9

Monday, October 26, 2015
Classification: Naïve Bayes
Reading: Chapter 8

Wednesday, October 28, 2015
Classification: Linear Discriminant Analysis
Reading: Chapter 12

Monday, November 2, 2015
Review of Supervised Learning

Wednesday, November 4, 2015
Dimension Reduction: Principle Component Analysis

Monday, November 9, 2015
K Nearest Neighbor (kNN)

Wednesday, November 11, 2015
Veterans Day (no class)

Monday, November 16, 2015
Hierarchical Clustering

Wednesday, November 18, 2015
K Means Clustering

Monday, November 23, 2015
Time Series Analysis

Wednesday, November 25, 2015
End-To-End Analytics 1

Monday, November 30, 2015
End-To-End Analytics 2

Wednesday, December 2, 2015
Guest Speaker

Monday, December 7, 2015
Team Presentations 1

Wednesday, December 9, 2015
Team Presentations 2