Fall 2021

Instructor: Hamed Mamani	
Office: PCAR 547	**Office Hours:** By appointment
Phone: 206-543-0787	**Class Schedule:** Mondays 6:00pm-9:30pm
Email: hmamani@uw.edu	**Class Location:** PCAR 290

Course Description and Objectives

Data 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 data analytic techniques via quantitative tools and sophisticated software (R and Tableau). These techniques are drawn from machine learning, data mining, and optimization. Note that this is not a technical or theoretical course. This course does not aim to produce experts in statistical analysis; rather, the aim is to provide students competency to interact with and manage a team of analytics professionals. Furthermore, this is not a technical or theoretical course; we will instead focus on the application of analytics techniques to real business situations, with the aim of creating insight and value.

The course is divided into the following six main modules under three topic areas of Descriptive Analytics, Predictive Analytics, and Prescriptive Analytics:

1. Introduction and Visualization (Descriptive and Inferential Analytics)
2. Unsupervised Learning: Clustering (Descriptive and Predictive Analytics)
3. Supervised Learning: Prediction (Predictive Analytics)
4. Supervised Learning: Classification (Predictive Analytics)
5. Data Preparation and Cleaning
6. Projects

Our course goals are the following:

1. Students should be able to think critically about data analysis, which includes selecting the right type of analysis for a given task.
2. Students should be able to identify opportunities of applying data 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.

Recommended Textbook (not required)

The Analytics Edge, Bertsimas, O'Hair, Pulleyblank. Dynamic Ideas. 1st Edition; 2016.

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. In addition, we will be using Tableau and R in this class. These software packages are both available in the computer labs in Paccar 190. Student licenses to Tableau will be provided; R is free.

- Tableau can be downloaded at http://www.tableau.com/products/trial
- R can be downloaded at https://cran.fhcrc.org

.**Assignments**

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 assignment of this course will consist of a group project where teams (of 4-5 students) will apply the techniques of the course to real data. There are four sets of deliverables:

1. 3 progress reports, due October 25, November 8, and November 22.
2. A 15-20 minute presentation to the class on December 6.
3. A 5-10 page writeup.
4. Peer evaluations of your group members.

Further details will be discussed in class.

Grading

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

1. Assignments 50%
2. Group Project. 40%
3. Quizzes 10%

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. Assignments and Team Projects are submitted electronically through this website (by their due dates!).