Syllabus for
DATAAVS 210 A: Data Visualization Essentials (165909)
Data Analytics (5889)

Instructor:
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Office Hours: upon request

Location: Bellevue
Class Meetings: Mondays 6-9PM
Dates: 1/08/18 – 3/26/18

COURSE DESCRIPTION:

This is the second of three courses in the Data Analytics program. This course introduces you to data exploration and visualization techniques with a focus on working with complex real-world data. You will work to integrate, explore and visualize complex real-world multi-source data sets to gain insight from the relationships in these data. In the first course we focused on the first three aspects of the data analysis process, asking questions, data wrangle, and data exploration. This time around we focus on the last two aspects of the process; drawing conclusions and communicating our findings.

QUESTION -> WRANGLE<-> EXLORE -> [DRAW CONCLUSIONS -> COMMUNICATE]

We will use executive reports and digital dashboards to explain the steps of drawing conclusions and communicating findings.

COURSE LEARNING OBJECTIVES:

After successfully completing this course, you will be able to:

- Determine the data requirements to address business problems.
- Query data sources using SQL, R and PowerQuery.
- Create different complementary views of data by applying multiple chart types to explore complex data relationships and present results.
- Project multiple dimensions of the data onto a 2D surface through use of plot aesthetics.
- Choose correct chart types and aesthetics, given the types of data to be displayed.
- Explain reasons to avoid certain charting practices which can distort the viewer's perception.
- Create dashboards with Power BI, including multiple tile displays and interactive displays.
- Use basic statistical methods to understand and present to a non-technical audience relationships in complex data.

Course Format:

This is a classroom-based course, meaning you will be attending weekly sessions in person where we will cover the lesson content with short presentations. You will also see demonstrations of the lab exercises and try some of those by yourself. There will be in-class discussions about the lesson topics and other activities. You will be able to do your exercises, quizzes, and assignments on your own time. You will use Canvas LMS as the main site to track the weekly tasks and access all the materials you need to complete the exercises and assignments. You will also submit your assignments using Canvas LMS and will take the quizzes there. Your grades and assignment feedback will be posted in Canvas.

Course Materials:

There are no required textbooks for this course. However, we have a list of supplementary textbooks and online resources useful for this course:

Probability and Statistics

- *Statistics Done Wrong, the Woefully Complete Guide*, Alex Reinhart, 2015, ISBN-13: 978-1593276201
- *Naked Statistics, Removing the Dread From Data*, Charles Wheelan, 2014, ISBN-13: 978-0-393-34777-7
- *Errors, Blunders and Lies*, David Salsburg, 2017, ISBN-13: 9781498795784
- *Statistics in a Nutshell*, Paul Watters and Sarah Boslaugh, 2009, ISBN-13: 978-1449316822
- *What is a P-Value Anyway: 34 Stories to help you actually understand statistics*, Andrew Vickers, 2010, ISBN-13: 9780321629302

R Programming

- *R for Data Science, Import, Tidy, Transform, Visualize and Model Data*, Hadley Wickham and Garrett Grolemund, 2016, ISBN-13: 978-1491910399. There is a free version available online .
- R Statistics.net tutorial

SQL

- w3schools SQL. Tutorial
- Kahn Academy. Search for SQL Tutorial, Intro to SQL, Querying and managing data

Visualization & Data Science

- *The Visual Display of Quantitative Information*, Edward Tufte, 2001, ISBN-13: 978-0961392147
- *Power Pivot and Power BI, The Excell Users Guide to DAX, Power Query, Power B and Power Pivot in Excel 2010-2016*, Rob Collie and Avichal Singh, 2016, ISBN-13: 978-1615470396
- *Data Science for Business*, Foster Provost and Tom Fewcett, 2013, ISBN-13: 978-1449361327

Technical Requirements:

Your course uses the following technology. Please check that the Hardware/Software of your device meets the requirements.

Technology	Hardware/Software
Canvas LMS	Browser (Chrome, Firefox, or Safari), Bandwidth (Internet Speed), Flash Player
Lecture Videos with MediaAMP	Bandwidth, Speakers or headphones
PDF Viewer	Adobe Acrobat Reader
Windows 10 with the Software listed on the right column. Or Virtual lab with class provided software using a browser.	Office 365 Pro SQL server management studio PowerBI Desktop R Studio Desktop

Course Webpage:

Canvas LMS for DATAAVS 210: https://canvas.uw.edu/courses/1177930
You will need your UW NetID login and password to access this site.

Course Topics:

Lesson	Topics
1	Project Development & Planning
2	Data Acquisition & Wrangling (SQL & R)
3	Intro to PowerQuery and Data Modeling
4	DAX Fundamentals
5	Visual analysis and Aesthetics
6	Modern Visualization Tools
7	Data Visualization and Graphics
8	Advanced Reporting
9	Dashboards
10	Future Trends & Final Project

STUDENT ASSESSMENT:

To successfully complete this course, you must:

- Attend and participate actively in class activities
- Complete all the exercises and answer the quiz questions
- Submit the assignments
- Submit the milestone projects
- Submit a final project

You will need an overall average score of 80% or more to pass this course. Your grade for this course will be recorded on your transcript as SC (satisfactory completion) or USC (unsatisfactory completion).

Grading Table:

Your grades are based on the following components:

Component	**Percentage**
Attendance and Participation	10%
Quizzes	10%
Assignments	20%
Milestone Projects	30%
Final Project	30%

Attendance and Participation: You are required to attend the majority of the classes. You cannot miss more than 2 classes without proper justification. You are expected to participate in class discussions and activities.

Quizzes:
There are weekly quizzes to test your knowledge of each topic. The quiz questions will be based on the lectures, exercises, and assignments so it is important for you to complete all the parts of the lessons.

Assignments: There will be one assignment for each week except for the weeks where you need to submit a milestone project. The assignments present opportunities for you to demonstrate that you are able to complete the exercises and analysis in a more independent way. You will use the virtual lab environment or your own software to complete the coding assignment and then submit the file to the assignment section in canvas.

Milestone projects: the milestone projects ask you to put in practice what you have learned in multiple lessons in a more real world setting. There will be 3 milestone projects, the first is after lesson 3, the second is after lesson 5, and the third is after lesson 7.

Final Project: for the final project you will complete a report and create a dashboard that convey accurate and clear insights to support decision making.

Late Work

No late work will be accepted after 1 week from the due date.

Student Code Policy:

The University of Washington's Student Conduct Code applies to all students, including students enrolled in UW Professional & Continuing Education courses. Students are expected to maintain the highest standards of academic responsibility. Plagiarism and other kinds of academic misconduct are considered serious offenses at the UW. Plagiarism is using someone else's words or ideas without proper citation. It can range from failure to credit a single sentence or paragraph to passing off an entire article, speech or another student's paper as one's own. Instances of academic dishonesty for noncredit courses are handled by the University of Washington Professional & Continuing Education Committee on Academic Conduct. If evidence of academic misconduct is established, the student will be given a failing grade for the course and any request for a refund of course or other fees will be denied.

Disability Services:

The Disability Services Office strives to help make the UW community more accessible for all. If you are a non-degree student seeking accommodation for a permanent or temporary disability, contact the office for more information and assistance. You can reach Disability Services at 206-543-6450 or dso@uw.edu.