Penn State Actuarial Science
Technical Workshop Series Syllabus: Spring 2021

Instruction Team:

- Excel: Brady Painter (bcp5201@psu.edu)
- VBA: Dustin Bauer (dtb5308@psu.edu)
- R: Eric Geesaman (erg5331@psu.edu)

Presentation Dates:

- Excel
  - Presentation 1: Wednesday, March 17, 2021 (6:00-7:00 PM EST)
  - Presentation 2: Wednesday, March 24, 2021 (6:00-7:00 PM EST)
- VBA
  - Presentation 3: Wednesday, March 31, 2021 (6:00-7:00 PM EST)
- R
  - Presentation 4: Thursday, April 8, 2021 (6:00-7:00 PM EST)
  - Presentation 5: Wednesday, April 14, 2021 (6:00-7:00 PM EST)

Office Hours:

- Excel
  - Sunday, March 21, 2021 (6:00-7:00 PM EST)
  - Sunday, March 28, 2021 (6:00-7:00 PM EST)
- VBA
  - Wednesday, March 31, 2021 (7:00-8:00 PM EST)
  - Friday, April 2, 2021 (12:00-2:00 PM EST)
  - Monday, April 5, 2021 (1:30-3:00 PM EST)
- R
  - Sunday, April 11, 2021 (6:00-7:00 PM EST)
  - Sunday, April 18, 2021 (6:00-7:00 PM EST)
- Final Project
  - Sunday, April 25, 2021 (6:00-7:00 PM EST)

Required Programs:

- Excel
- R and R Studio (see page 2 for installation instructions)

Series Objective:

The workshop series will present commonly used technical skills in the actuary industry and will foster proficient technical skills in each of the three programs. Through successful completion of assignments and the final project, students' technical skills are verified to recruiters. Students will receive verification of their skills with a diploma and special designation in the resume books upon successful graduation.

Course Format:

The workshop series will be presented and recorded using Zoom. Office hours will also be held through Zoom. The code and password are included in the "Presentation Dates" and "Office Hours" sections of this document.

Assignment Due Dates:

Generally, all assignments are due a week after the corresponding presentation. For example, the first presentation is on March 17, 2021, so the first assignment is due on March 24, 2021 by 12:00 AM EST.

- Excel
  - Assignment 1: Wednesday, March 24, 2021 by 11:59 PM EST
  - Assignment 2: Wednesday, March 31, 2021 by 11:59 PM EST
- VBA
  - Assignment 3: Thursday, April 8, 2021 by 11:59 PM EST
- R
  - Assignment 4: Thursday, April 15, 2021 by 11:59 PM EST
  - Assignment 5: Wednesday, April 21, 2021 by 11:59 PM EST
- Final Project
  - Wednesday, April 28, 2021 by 11:59 PM EST

Grading Policy:

All the combined assignments have the same weight as the final project. Students can submit each assignment twice for grading but can only submit the final project once. If a student does not submit an assignment/project on time, half credit will apply for one day. The assignment/project will not receive any grade if it is more than a day late. To successfully complete the workshop series, students must receive at least 80% of the total credit. Standard rounding will apply to grading. Additionally, a rubric will be provided for each assignment and the final project. This will allow students to clearly view the standards for each graded activity.

- Weights
  - Assignments: 50% (each 10%)
  - Final Project: 50%
- Final Grades
  - Graduation: 79.5-100%
  - Unsuccessful Graduation: 0-79.49%

Instructions for Installing R and R Studio:

- To install R and R Studio on Mac or Windows, use this link: https://courses.edx.org/courses/UTAustinX/UT.7.01x/3T2014/56c5437b88fa43cf828bff5371c6a924/. Follow the instructions for the first two orange subsections ("To Install R" and "To Install RStudio") and ignore the last orange subsection ("To Install the SDSFundations Package"). Under step 3 of "To Install R", select the first CRAN Mirrors option: 0-Cloud. Contact Eric Geesaman at erg5331@psu.edu if problems or questions arise during installation.

Presentation Schedule (Table):

Presentation	Date	Description
Excel (1)	03/17/2021	Introduction to commonly used functions in Excel
Excel (2)	03/24/2021	Rearranging tables and data in Excel
VBA (3)	03/31/2021	Introduction and Basics of VBA
R (4)	04/08/2021	General Overview, R Studio, Packages, Functions, Data Creation in R, Data Importing into R, Data Wrangling
R (5)	04/14/2021	Graphics in R

Assignment Schedule (Table):

Assignment	Due Date	Description
Excel (1)	03/24/2021	If Statements, Match-Index, and Similar Functions
Excel (2)	03/31/2021	Pivot Charts, Sort/Filter Commands, and Conditional Formatting
VBA (3)	04/08/2021	Using Macros, xlDown, and If Statements
R (4)	04/15/2021	Data Importing (Websites and CSV files), Data Wrangling
R (5)	04/21/2021	Graphics
Final Project	04/28/2021	Data Wrangling (Excel), Graphics (R)

Program Goals and Objectives:

- Excel
  - Students will have a strong understanding of Excel's layout and tools.
  - Students will be able to use if statements and plural if statements to pull data with specific criteria from a spreadsheet.
  - Students will be able to use match, index, vlookup, and hlookup functions as well as a combination of these functions to pull data of interest from a spreadsheet.
  - Students will have the necessary skills to reorganize data tables using filters, conditional formatting, and pivot charts.
  - Students will understand absolute and relative references and when to use them.
- VBA
  - Students will be able to navigate the VBA window.
  - Students will learn how to create Macros and understand why they work.
  - Students will understand what Subs, Functions, Objects, Variables, and Events are and how they are used in VBA.
  - Students will be able to automate basic tasks using variables, logical statements, and loops within VBA.
- R
  - Students will be able to distinguish R from R Studio and R Markdown.
  - Students will learn multiple packages and their functions. The most important are as follows:
    - **rmarkdown** – exporting files from R Markdown
    - **tidyverse** – chaining functions together with pipe operator
    - **dplyr** – manipulating/wrangling data
    - **xml2** and **rvest** – importing data from websites
    - **ggplot2** and **plotly** – graphing data
  - Students will learn graphics options in R and be able to create a variety of graphs for different data and purposes.
  - Students will be able to answer data-specific questions, both through data wrangling and graphing.