BSDS 100: Intro to Data Science with R (Fall 2018)

Class Time and Location: TR, 2:40–4:25 PM in Harney 430

Instructor: Abbie M. Popa **Email:** apopa@usfca.edu

Office Hours: TR, 1:20 - 2:20 PM in Harney 107B (James Wilson's Office)

Course Overview: This course provides an introduction to the world of data science and analytics. This course will provide an overview of the basic tools and techniques available for making informed, data-driven decisions in a complex world. By the end of this semester, you will have a comfortable understanding of how to use the R programming language and RStudio to visualize, wrangle, manipulate, and explore data of many types and sizes. You will have familiarity with the following key aspects of programming and analysis:

- data visualization
- programming basics, workflow, and input/output
- data aggregation
- exploratory data analysis
- writing and applying functions
- vectorized programming
- manipulating and analyzing strings, factors, dates, and numeric data

You will learn how to use an array of modern data analytic packages in R including *ggplot2*, *tibble*, *tidyr*, *dplyr*, *knitr*, and *stringr*.

Course Learning Outcomes: By the end of this course, students will be able to

- Proficiently wrangle, manipulate, and explore data using the R programming language
- Use contemporary R libraries including *ggplot2*, *tibble*, *tidyr*, *dplyr*, *knitr*, and *stringr*
- Visualize, present, and communicate trends in a variety of data types
- Communicate results using R markdown and R Shiny graphical user interfaces
- Formulate data-driven hypotheses using exploratory data analysis and introductory model building techniques

Course Website: `https://github.com/abbiepopa/BSDS100`

Required Textbook: *R for Data Science* by Hadley Wickham and Garret Grolemund
Available for free online here: `http://r4ds.had.co.nz/index.html`

What you are required to bring to class: Please bring a laptop and a pen to every class

Attendance: Attendance is required every day and will be recorded and worth 20% of your final grade. It is your responsibility to catch up on any lecture material, homework, or programming lesson that you miss due to an absence.

Assessment: Grades will be assigned according to the following assessment.

- **Attendance** (20%): Attendance will be recorded every class based on completion of minute cards and participation in in-class activities.
- **Assignments** (40%): For each assignment, you will be required to upload a .pdf file to the Canvas site that contains your R code, any analyses, and any visualization used to answer the questions on the assignment. This .pdf file **must** be a result of compiling R code in RStudio using the *knitr* package. These must be submitted before the deadline set on github. Assignments should be completed individually, unless otherwise noted. That said, consulting others and online resources is allowed. As a general rule of thumb if you are copy-pasting either from a classmate or a website you are probably cheating.
- **Case Studies** (20%): There will be several in- and out- of class case studies that will focus on data science analysis and coding.
- **Final Project** (20%): The final project will be a computational case study that brings together the techniques learned throughout the semester.

Important Dates:

- Monday, August 27th - Last day to add
- Friday, September 7th - Census date. Last day to withdraw with tuition reversal
- Tuesday, October 16th - Fall break (**no class**)
- Friday, November 2nd - Last day to withdraw
- Thursday, November 22nd - Thanksgiving Holiday (**no class**)
- Tuesday, December 4th - Last day of class!

Academic Integrity. As a Jesuit institution committed to *cura personalis* – the care and education of the whole person – USF has an obligation to embody and foster the values of honesty and integrity. USF upholds the standards of honesty and integrity from all members of the academic community. All students are expected to know and adhere to the University's Honor Code. You can find the full text of the code online at `http://myusf.usfca.edu/academic-integrity/`. The policy covers:

- Plagiarism – intentionally or unintentionally representing the words or ideas of another person as your own; failure to properly cite references; manufacturing references.
- Working with another person when independent work is required.
- Submitting work written by another person or obtained from the internet.
- The penalties for violation of the policy may include a failing grade on the assignment, a failing grade in the course, and/or a referral to the Academic Integrity Committee.

Students with Disabilities. If you are a student with a disability or disabling condition, or if you think you may have a disability, please contact USF Student Disability Services (SDS) at (415) 422-2613 within the first week of class, or immediately upon onset of disability, to speak with a disability specialist. If you are determined eligible for reasonable accommodations, please meet with your disability specialist so they can arrange to have your accommodation letter sent to me, and we will discuss your needs for this course. For more information, visit `http://www.usfca.edu/sds`.

Behavioral Expectations. All students are expected to behave in accordance with the Student Conduct Code and other University policies (see `http://www.usfca.edu/fogcutter/`). Students whose behavior is disruptive or who fail to comply with the instructor may be dismissed from the class for the remainder of the class period and may need to meet with the instructor or Dean prior to returning to the next class period. If necessary, referrals may also be made to the Student Conduct process for violations of the Student Conduct Code.

Learning, Writing, and Speaking Centers

The Learning, Writing, and Speaking Centers at USF provide individualized support to assist you in better understanding course material and to aid you on your path to success. Services are free and include one-on-one tutoring, group tutoring, and one-on-one Academic Skills Coaching appointments to discuss effective study strategies. The Learning Center supports over 80 courses each semester. The Writing Center helps students develop their writing skills in rhetoric, organization, style, and structure, through one-on-one interactive conferences. The Speaking Center helps students prepare for public speaking - including speeches, oral presentations, team presentations, and visual aid demonstrations. International students may also contact us to learn more about communicating with professors and general academic study skills. The Learning, Writing, and Speaking Centers are located on the Lower Level of Gleeson Library (G03). Please contact them at (415) 422-6713 for further assistance or visit: `https://myusf.usfca.edu/lwsc` to make an appointment.

Counseling and Psychological Services (CAPS). CAPS provides confidential, free counseling to student members of our community.

For more information, see `https://myusf.usfca.edu/student-health-safety/caps`.

Confidentiality, Mandatory Reporting, and Sexual Assault

As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. I also have a mandatory reporting responsibility related to my role with the University. I am required to share information regarding sexual misconduct or information about a crime that may have occurred on USFs campus with the University. For information and resources regarding sexual misconduct or assault visit:

- The Title IX coordinator website (`https://myusf.usfca.edu/title-ix`)
- USF's Callisto website (`https://usfca.callistocampus.org`).

Ability to Change Syllabus - I, Abbie M. Popa, will do my best as an instructor to abide by the guidelines set forth in this syllabus throughout the year. I do, however, have the right to change components of this syllabus at my own discretion if I deem such changes as necessary.