By the end of this class, you will have learned:
- The fundamentals of programming with R statistical software. This includes objects, data classes, functions, data wrangling, plotting/graphing, and making reproducible reports
- The fundamentals of basic statistics including distributions, correlations, t-tests, ANOVAs, and linear regression
- A theoretical foundation for the principles of data visualization
- A knowledge base in which to expand your statistical horizons by using more sophisticated code, such as bootstrapping and writing your own functions (make your code work for you!)

Course Philosophy:
Programming & statistics are increasingly becoming a demanding skill across a wide variety of fields, including psychology, neuroscience, and other related disciplines. The goal of this course is for you to leave understanding core fundamentals of applied programming and statistics. Although we will use R software, the core concepts should carry with you to other programming languages (Python, MATLAB etc.).

“The only difference between a beginner and expert programmer, is that the expert is better at Googling”. My goal is to get you to the point where you can effectively Google R-related questions and mostly understand the results.

There will be 3 units:
1. Getting you up to speed with coding in R. This will include weekly homework assignments and you will review one of your peers’ code each week.
2. Recap of statistics learned in Psych 300 (Intro to Psych Stats). However, the material will focus on the application of these tests in R, accessing their results, and incorporating them into academic manuscripts.
3. This will include some more advanced, nuanced topics such as theoretical understanding of the principles in data visualization, using for loops and conditional statements to perform simulations, and writing your own R functions that can be as general or specific as you’d like.

Materials:
There is no textbook for this class. There are 3 tools we will be using for this class:
1. R & RStudio. Students must have R and RStudio installed on their personal computers. Versions will depend on the computer’s software, but please try to use the latest version
that your computer allows. It is highly recommended that all students update their
computer before installing either R or RStudio. For Mac users, it is best if El Capitan or
higher is installed. For PC users, Windows 10 is appropriate. For students using other
platforms, please contact the instructor directly for instructions. Detailed installation
instructions can be found on the course website (#2). If you understand computers well,
and want to get a head start, you can find the appropriate download for R at
2. The course website is https://relaxed-swirls-04c8f0.netlify.app/
   Bookmark this page, as you will use it for 80% of this class! Here you will find
everything you need for the course including: all lecture videos, all slides, all practice
sets, and your assignments. I will be updating this website every Monday morning
between the hours of 7-9am. Some aspects of the site might not work during these hours.
Please consider this site maintenance time, and avoid using the website during this
timeframe.
3. Canvas. This is where all code reviews and quizzes will take place (see next section) and
   all grades will be posted.

Grading:
Grades will be comprised of homework, peer review, quizzes, and a final project.

Homework assignments will be posted on the course website, and are all frontloaded in Unit 1 at
the beginning of the class. This is to make sure that you get lots of practice as you’re learning the
basics of R. Coding is a skill, and practice is the best way to hone your skill. If you have a
dataset you’d like to work with for these assignments, please let me know ahead of time so we
can make sure it has certain characteristics that will be beneficial for the assignments. Otherwise,
I will post a dataset that you may use. Each homework assignment will be worth 8 points and
there will be 5 of them for a total of 40 possible points. Each day an assignment is late, I will
remove 2 points unless you contact me and we discuss other arrangements. While I will not
grade code on exactness or perfection, I do expect an answer (including code or even a few
sentences, when applicable) for every question. Points will be taken away if a question is skipped
or not thoroughly answered. However, I will not take off points for incorrect code, as long as it’s
clear you have tried your best to figure it out.

After each homework assignment, you will be randomly assigned to a peer in your class, and you
will review the code from each other’s homework assignment. You will fill out several
discussion prompts on Canvas about your peer’s code. The goal is for you to gain experience in
reading other peoples’ code and for you to obtain consistent feedback from someone other than
the instructor. Each peer review assignment will be worth 4 points and there will be 5 of them for
a total of 20 points possible. Points will be taken away if the prompts are not completely
answered. For example, if I ask for 2 good things about your peers’ code, and you only provide 1
example, points will be taken away from your code review assignment.

There will be 4 quizzes spanning Unit 2 and into the beginning of Unit 3. They will be
administered via Canvas. You are permitted to use your notes and the internet, but you must
NOT discuss with your peers. Each quiz will be worth 5 points for a total of 20 points possible.
You will complete a final take-home project due during finals week (if you want to turn it in before then, that’s OK!). This project will be completely R-based, and will incorporate skills learned over the semester with extra emphasis on those learned in Unit 3. If you would like to use your own dataset for this, you must tell me ahead of time and get it pre-approved! This project will be worth 20 points. To earn full marks on this project, your code must compile (meaning if I run the code, as is, it should work perfectly) and you must answer all portions of the assignment.

Homeworks (40 points) + Peer Reviews (20 points) + Quizzes (20 points) + Final Project (20 points) = 100 points total.

Final grades will be rounded to the nearest percentage point. The following percentage scale will be used for assignment of final grades:

- A = 93%-100%
- A- = 90%-92%
- B+ = 87%-89%
- B = 83%-86%
- B- = 80%-82%
- C+ = 77%-79%
- C = 73%-76%
- C- = 70%-72%
- D+ = 67%-69%
- D = 63%-66%
- D- = 60%-62%

**COVID-19 & How to be OK**

(This section was created, albeit slightly modified, from [this awesome tweet by Dr. Chris Jones](https://twitter.com/DrChrisJones/status/1259864745500259840). And, you know, the state of the world.)

In case you hadn’t noticed, there is a [global pandemic](https://www.who.int/emergencies/diseases/novel-coronavirus-2019). None of us are really “OK”. If you tell me you’re having trouble, I’m not going to judge you or think less of you. I hope you’ll extend me the same grace.

Let’s set the stage:
- You never owe me personal information about your health (mental or physical), or anything else. Since this course is entirely online, we do not have to worry about the whole class physically distancing or needing to go into quarantine if one of us is exposed.
- You are always welcome to come talk to me about things that you’re going through, however.
- If I can’t help you, I usually know somebody who can.
- If you need extra help or you need more time with something, just ask. I’ll work with you. Promise.

**Online Learning Tips & Resources:**

For those of you who have never taken an online class (and those who have!), one thing you might not be prepared for is the amount of intrinsic motivation needed to succeed. While it’s great to be able to access material at your own pace, many students mistakenly think this somehow makes the class easier. It is, unfortunately, all too common for students to fall into the trap of procrastination and ultimately fall behind in the class. Don’t let this be you! Here are some steps you can take right now to ensure you are ready to rock and roll.
• Make a schedule for yourself, and stick to it! Carve out time to watch the lectures, complete the practices & assignments, and complete your peer review. One of the biggest challenges with online learning is time management, so do what you need to get ahead of this. There are TONS of apps and tools to help you with this. They can take the form of calendars, organizers, time tracking apps etc.

• Personally, I get distracted all the time. If that sounds like you, consider some apps like Cold Turkey, Freedom, or others that will block external sites (Twitter, Netflix, etc.) and help you focus.

• Be an active participant in the class! Engage with me and your fellow classmates via discussion boards. If you have a question, it is very likely that one of your peers does too. **Don’t be shy about posting a new discussion thread!**

**Online Etiquette**

We will be making use of discussion threads on Canvas. Students are expected to maintain a polite and respectful tone in their online discourse. Some things to consider:

- Any communication shared privately may become public, so be mindful of what you share in discussion boards or chats. This is especially true for sharing any personal and/or identifying information about you or someone else. Do not share any passwords or divulge any personal information (yours or others) that can be used in a malicious manner (phone numbers, addresses etc.).

- Humor doesn’t always translate in an online forum. If you want to make a joke or a sarcastic remark, be 100% sure that it is clear you are joking.

- Your comments must be readable to everyone, therefore I ask that you please refrain from using shortcuts. For example, please type out “you” instead of “u”. Very common acronyms are OK (“lol” or “haha”). But please refrain from acronyms that are not as well-known (“fwiw” etc.).

- Treat your classmates and professor with kindness and respect. Any indication of online harassment or bullying will not be tolerated and will be reported. This is especially pertinent when giving constructive feedback in code reviews.

- Please avoid using ALL CAPS because it can be interpreted as yelling.

**Academic Policies & Resources:**

- **University Code of Conduct**
  - Any student found guilty of academic misconduct, such as cheating, plagiarizing, forgery, or furnishing false information to a University official will be subject to consequences including failing the class, suspension from the University, or expulsion from the University.

- **Special accommodations** (such as a learning, sensory, or physical disability or any other diagnosis that requires special accommodations and/or assistance with lectures, reading, written assignments, and/or exam taking)
  - Contact Disability Resources at disabilityresources@wustl.edu or call 314-935-5970
  - Please contact me as soon as possible if you need special accommodations. Once I have the Accommodation Letter from Disability Resources, we can discuss ways to modify the course experience for you.

- **Mental & Physical Health:**
- **WUSTL Police Department**
  - On campus emergency, please call 314-935-5555

- **Relationship or sexual violence, including sexual harassment and stalking**
  - Contact a licensed **RSVP** counselor (confidential, with some limited information being shared as needed with the appropriate university administrator) at rsvpcenter@wustl.edu or call 314-935-3445
  - Contact the University’s Title IX Director, Ms. Jessica Kennedy, at jwkennedy@wustl.edu or call 314-935-3118

- **PLEASE NOTE** You can always come talk to me. Period. However, if you come to me with any issues surrounding child abuse, suicidal tendencies, or sexual assault, sexual discrimination, sexual harassment, dating violence, domestic violence or stalking, I am required to report these to their appropriate administrators. Washington University faculty and administrators strive to maintain confidentiality, but some information may need to be disclosed when it is a matter of safety.

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