Data Science for Biologists, COVID-19 Version

Updated on 3/18/20 for Remote Instruction beginning 3/30/20

Course Instructor	Stephanie J. Spielman, PhD (Dr. Spielman or Professor Spielman)
Email	spielman@rowan.edu
Link to join class Slack	CLICK ME
Course Website	https://spielmanlab.github.io/courses/datascience_for_biologists/

Course Description and Objectives:

Modern-day biological research produces volumes of data that all scientists need the skills to analyze. In this course, students will learn and apply foundational concepts in data science, including visualization, wrangling, modeling, and communicating using open-source and reproducible frameworks. This course assumes no background in any computer programming or other computational skills.

Upon completing this course, students will be able to:

- Apply the R statistical computing language (notably the "tidyverse" packages) to visualize, interpret, manage, and model data
- Communicate data analyses using professional markup languages
- Utilize version control for code and data management, communication, and reproducibility
- Become familiar with real datasets from the biological research
- Develop and address scientific questions using reproducible data science techniques

Required Texts and Materials:

- All students need a laptop or similar (i.e. Microsoft Surface) with functioning wifi. There are NO other computer requirements! Mac or Windows are both ok, the amount of memory (RAM) is ok, etc. **Students should bring their machine to EVERY class.**
    - If you have an external mouse, I highly recommended bring to class.
- All course materials are *freely available online!!* There is NO need to purchase any books or other materials. Please consult the course website for all links to materials.

Evaluation:

Your grade will be derived from the following assessments:

Assessment	**Deadline**	**Percentage of final grade**
Mid-semester Project	Due 3/29/20	25%
Weekly Assignments	Due weekly	75%

1. You are strongly encouraged to discuss assignments and the mid-semester project with your classmates. **However, all students must submit their own code and written language. *This is taken extremely seriously.***
2. You are expected to work independently on your final project, however you are still encouraged to discuss broad concepts in data science with classmates! ***Again, all code and written language must be YOUR OWN.***
3. For additional factors that may affect your grade, see "Course Policies."

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Your final grade will be converted to a letter grade according to the table below. Percentages for final grades are rounded; for example, a final grade of 89.5 rounds to an A-, and a final grade of 89.4 rounds to a B+.

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

#TidyTuesday Extra Credit

Starting in week three of the semester (Monday February 3rd, 2020) there will be *weekly* opportunities for extra credit! You can receive a bonus **1% towards your final grade** for each "Tidy Tuesday" dataset you analyze, which will be discussed more in class. To obtain the extra credit, you must do the following:

- Produce one original figure displaying the data
- Use RMarkdown and fully reproducible practices to create the figure
- Share on social media with the hashtag #tidytuesday OR provide me with all your Tidy Tuesday work (stand-alone figure and corresponding RMarkdown) so that it can be shared (with option for anonymous sharing!)
    - Once we have learned version control with git (likely early March), you can **add 0.5% to this extra credit** by submitting your TidyTuesday code and visualization to me via a GitHub pull request for a total of **1.5% bonus.**

Even though this is extra credit, any figure or code that is NOT *ENTIRELY* YOUR OWN will constitute an Academic Integrity Violation and be subject to University penalties. Do NOT try to be sneaky.

Course Policies:

1. **Assignment Policy**
    a. *Late assignments submitted will NOT be accepted without prior permission.* If you need an extension on an assignment, you must contact me at least 24 hours in advance of the deadline with a request for an extension explaining why it is merited. If you receive a positive email confirmation in response, you have been granted an extension.
    b. All students will receive a one-time "free" late assignment that must be submitted within 24 hours of the deadline. You must notify me if/when you use your late assignment no later than the original deadline.
    c. Your lowest assignment grade will be **dropped!!**

2. **Attendance Policy**
    a. No more attendance! Happy remoting!

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3. **Email Policy**
   Please do not expect an email response between the hours of 7 pm - 9 am, and anytime on Saturday. Please also primarily use Slack for communication in the post-COVID times.

4. **Academic Integrity Policy**
   Academic integrity is taken **EXTREMELY SERIOUSLY** in this class. You are ALWAYS expected to submit your OWN work, both code and written language. **Any form of cheating or plagiarism, including plagiarism of code, is not permitted and WILL BE REPORTED TO THE UNIVERSITY, NO EXCEPTIONS.**

   There are *limited* circumstances when code reuse is acceptable, including:
   - Front matter in Rmarkdown documents
   - Specific phrasing of hypothesis testing results and conclusions
   - Template code that I provide explicitly for your use

   You may NOT:
   - Copy/paste your code from the internet.
   - Copy/paste your code from someone else's code.
   - Copy/paste your code from elsewhere, but change the variable names so I can't tell. (Hint: I can tell.)
   - Do anything besides write your own code!

   It is understood that there are certain circumstances when many/most ways to code a problem are exactly the same. You will never be penalized in these circumstances.

5. **Regrade Policy**
   If you feel that a re-grade of an assignment or project is merited, you must fill out and submit *on paper* a regrade form, which can be found on the course website. To be considered, this form must be submitted *within two weeks* of receiving the disputed grade. If you believe points were incorrectly added for an assignment or there is a similar minor grading error, you can speak with me directly to request a re-grade without this form.

6. **Key University Policies:**
   As a student at Rowan University, you are expected to adhere fully to all university-wide academic policies outlined here: https://confluence.rowan.edu/display/POLICY/Administrative+Policies.

   Key policies to be aware of can be found at the following links:
   - Classroom Behavior Policy: https://confluence.rowan.edu/display/POLICY/Classroom+Behavior
   - Academic Integrity Policy: https://confluence.rowan.edu/display/POLICY/Academic+Integrity+Policy

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- Student Accommodation Policy: https://confluence.rowan.edu/display/POLICY/Accommodation+Policy
- University Attendance Policy: https://confluence.rowan.edu/display/POLICY/Attendance+Policy

Rowan University is required to accommodate students with documented disabilities. **Your academic success is important. If you have a documented disability that may have an impact upon your work in this class, please provide the professor with up-to-date documentation from the Academic Success Center *as soon as possible!*** Students must provide documentation of their disability to the Academic Success Center in order to receive official University services and accommodations. The Academic Success Center can be reached at 856-256-4234. The Center is located on the 3rd floor of Savitz Hall. The staff is available to answer questions regarding accommodations or assist you in your pursuit of accommodations. Additional information and resources can be found at this link: https://sites.rowan.edu/disabilityresources/.