Computer Modeling (BIOL 551/L)

Introduction to transparent and reproducible data science

Spring 2023
In Person Delivery
Class #17701/8594
Slack Channel Biol551csun

Lecture: Tuesday & Thursday 1:00 - 1:50 pm LOI 1322

Lab: Tuesday & Thursday 2:00 - 4:50 pm LOI 1322

Instructor:	*Graduate Assistant:*
Dr. Nyssa Silbiger e-mail: nyssa.silbiger@csun.edu phone: 818-677-4427 Office Hours: Tuesday 9:30 – 10:30 Office: MG4109A	**Emily Wilson** e-mail: emily.wilson.514@my.csun.edu Office Hours: Thursday 11:00 – 12:00 Office:MG4107

Free online required readings:

Wickham and Grolemund: R for Data Science: Welcome | R for Data Science (had.co.nz)
Wilke: Fundamentals of Data Visualization: https://clauswilke.com/dataviz/
Healy: Data Visualization: A practical introduction: https://socviz.co/index.html#preface
Mastering Shiny: https://mastering-shiny.org/

Supplemental Texts (optional, but helpful):
Wickham: Advanced R: https://adv-r.hadley.nz/

Course Objectives: This course is intended to make you think like a coder and provide you with a general understanding on how to conduct transparent and reproducible data science. **This course is NOT a statistics or bioinformatics course**. You will learn how to script and use tools to make your data examination more transparent. The specific learning objectives include: 1) Be able to share your code and data on a public version-controlled repository, 2) create a reproducible script, 3) work collaboratively on a project, 4) learn efficient and effective ways explore your data, 5) create high quality visuals, and 6) learn to love working with data!

Course description: This course will combine a series of lectures with hands-on computer labs and group work. The goal is for you to be an active participant – in lectures and lab – because doing something is the best way to learn it. Further, you will also learn by teaching; therefore, you will have multiple opportunities for peer-learning and teaching in this course. The two portions of the course (lecture and lab) are integrated, and you must

take them both this semester. Your grade for both portions of the class will be based on coding assignments, presentations, short quizzes, and group participation (see Grading Policy, below). There are no exams in this class; however, learning a coding language, like any language, requires lots of practice and repetition to master it. **Therefore, this class will be a lot of work.**

In lectures, you will learn fundamental concepts in how to think like a coder and create reproducible data. *You are encouraged and expected to ask questions during lecture.* In labs, you will work on coding assignments. All textbooks are free and available online, **you are expected to complete all your required readings before class**.

Grading:

Component	Percent of Grade
Short Quizzes	10%
Tidy Tuesday Plots	10%
Lab Assignments	30%
Group R Package Presentation	20%
Group Assessment	5%
Final Independent Project	25%
TOTAL	100%

Your grade will be based on the components listed above.

Short quizzes are intended to encourage you to keep up with the readings and gain an understanding of the vocabulary associated with coding. These are 10-minute, multiple choice, open note quizzes, and occur biweekly. You will need to understand concepts associated with coding to be successful on the quizzes. I will drop your lowest grade.

Tidy Tuesdays, based on a weekly international coding group, is intended to advance your tidying and plotting skills with R. You will be required to participate in at least 8 of the 15 weeks this semester. (https://github.com/rfordatascience/tidytuesday). Points will be assigned based on creating an output and submitting your code to GitHub. The assignment details will be introduced AFTER we learn to plot. **You cannot turn in more than one a week so if you wait until the end of the semester, you will earn a 0 for any that are missing.**

Weekly lab assignments will be turned in independently but can be checked by your groupmates first. All assignments must be turned in on GitHub for full credit. Assignments will be graded according to the rubric on the class website/Canvas.

Anonymous group assessments will be sent to me at the end of the semester to ensure that everyone is contributing equally to the group work. Students will grade their group members according to the rubric on the class website/Canvas (e.g., preparedness, did they complete the readings before, etc.) and collaboration.

Group presentation, you will work with your assigned group to present an R package that was not discussed in lecture according to the rubric on the class website/Canvas.

Final independent project and presentation, you will use the skills you learned throughout the semester to tell a story with you own data (or publicly available data) and present it to the class according to the rubric on the class website/Canvas.

Your grade will be based on your percentage of the total possible points. You can use the following cutoffs as a guideline. I reserve the right to lower the grade cutoffs, but do not count on that happening.

Percent	Letter Grade
93-100	A
90-92	A-
88-89	B+
83-87	B
80-82	B-
78-79	C+
73-77	C
70-72	C-
68-69	D+
60-67	D
<59	F

Attendance: This is an intellectually challenging and time-demanding course. Attendance is important to be successful.

Communication: Outside of class time, I will communicate with you via your CSUN email account, Canvas, and our dedicated slack channel. If you do not normally use your CSUN email account, please configure it to forward your messages to your preferred account. You can expect me to respond to your email or slack messages within 24 hours (except on weekends or if I am in a place with no internet access). The slack channel will be used for you to easily communicate with your classmates and to ask for advice and share resources. **To sign into our class slack, click on this link and follow the directions.**

Your best source of course information is the course GitHub site (https://github.com/Biol551-CSUN/Spring-2023) and Canvas. Check the schedule on the website regularly because occasionally we may have to change the schedule due to unforeseen complications.

Expectations: You can expect me to be punctual, treat you fairly, return your graded assignments in a timely fashion, and most importantly, treat you with respect. In return, I expect you to treat other students, the GA, and me with respect and do everything you can to ensure a comfortable learning environment. For example, jokes or comments made in poor taste that make any member of the class uncomfortable will not be tolerated. Use of

cell phones, tablets, or computers during class for any purpose other than those directly related to the class (e.g., note taking and coding) is not allowed.

Diversity and Equity: It is my goal to create a learning environment that supports diversity of thoughts, perspectives, and experiences, and honors your identities. To help create an inclusive environment:

- Please let me know your pronouns at the beginning of the semester.
- If you feel like your performance in the class is being impacted by your experiences outside of class, please do not hesitate to come and talk with me. I want to be a resource for you.
- I (like many people) am still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone, including me) that made you feel uncomfortable, please talk to me about it. (Anonymous feedback is always an option).

Policies:

- **Cheating** will result in failure of the course and may result in further University discipline. The CSU policy states: *"Cheating or plagiarism in connection with an academic program at a campus is listed as an offense for which a student may be expelled, suspended, or given a less severe disciplinary action."*

- **Plagiarism** will result in you failing the assignment. Plagiarism is *"intentionally or knowingly representing the words, ideas, or works of another as one's own in any academic exercise"*. Don't do it. Remember to give full credit to authors and cite them in your *assignments*. If you are uncertain about what constitutes plagiarism talk to me.

- **Late assignments lose 10% per day**, i.e., the most you can receive for an assignment that is one day late is 90% of its point value, 2 days late 80%, etc.

- **Punctuality**: You must be on time to all lectures and labs.

- Students with **disabilities** must register with the Center on Disabilities and complete a service agreement each semester. Staff within the Center will verify the existence of a disability based on the documentation provided and approved accommodations. Students who are approved for test taking accommodations must provide an Alternative Testing Form to their faculty member signed by a counselor in the Center on Disabilities prior to making testing arrangements. The Center on Disabilities is located in Bayramian Hall, room 110. Staff can be reached at 818-677-2684.

- The Biology Department **withdrawal policy** states: *"Unrestricted withdrawals are permitted only until the end of the third week. Thereafter, requests to drop a class will be honored only when a verifiable serious and compelling reason exists and when there is no viable alternative to withdrawal. Poor performance is NOT an acceptable reason for withdrawal. During the last three weeks of the semester*

withdrawals will not be approved except when a student is withdrawing from ALL classes for verifiable medical reasons."

- Students and faculty each have responsibility for maintaining a safe and respectful space to express their reasoned opinions. Professional courtesy and consideration for our classroom community are especially important with respect to topics dealing with differences in race, color, gender and gender identity/expression, sexual orientation, national origin, religion, disability, and age.

As your instructor, one of my responsibilities is to help maintain a safe learning environment on our campus. In the event that you choose to write, speak or otherwise disclose about having experienced sexual misconduct/sexual violence, including rape, sexual assault, sexual battery, dating violence, domestic violence, or stalking and specify that this violence occurred while you or the perpetrator were a CSUN student, federal and state laws require that I, as a "responsible employee," notify our campus Title IX Coordinator. The Title IX Coordinator will contact you to inform you of your rights and options as a survivor and connect you with support resources, including possibilities for holding accountable the person who harmed you. Know that you will not be forced to share information and your level of involvement will be your choice.

CSUN's Title IX Coordinator is:
Barrett Morris
University Hall, Room 285
Phone: (818) 677-2077
E-Mail: barrett.morris@csun.edu

If you do not want the Title IX Coordinator notified, instead of disclosing the experience to me, you can speak confidentially with our Campus Care Advocate.*
CSUN's Campus Care Advocate is:
Katie LaRue Klotz
Student Health Center, Room 140G
Phone: (818) 677-7492
E-Mail: katelin.larue@csun.edu

For more information regarding your university rights and options as a survivor of sexual misconduct/sexual violence, please visit the University's Title IX website at: http://www.csun.edu/shinalight *Note: If it is determined that an alleged perpetrator poses an imminent threat to the broader campus community or if person(s) under 18 years of age are involved, our Campus Care Advocate is required to notify our Department of Police Services.