Statistical Methods in Psychology (Psych 70500-02)

Fall 2025, Tuesdays 5:30pm-8:20pm, C104

Instructor: Prof. Lily Johnson-Ulrich

Pronouns: she/her/hers
Email: lily.johnson-ulrich@hunter.cuny.edu
Office: 607HN
Office Hours: Drop in anytime between 4pm and 5pm on Mondays, Tuesdays, and Wednesdays. (*If you need to meet urgently outside Office Hours, please email me to arrange a separate meeting*).
Department: Psychology, 611HN

Prerequisites: *PSYCH 248 or equivalent*

Required Materials: Students are required to bring a functional laptop to class for coding in R.

Recommended Resources:
https://ourcodingclub.github.io/
https://stat545.com/
https://chatgpt.com/

Hunter College Course Description: Covers descriptive statistics and inferential methods, including t-tests, analyses of variance, correlation, simple regression, and an introduction to multiple regression. Some assignments require the use of a statistical computer package.

Learning Objectives:

- Apply analytical methods to behavioral data using R, including data wrangling, visualization, and statistical model fitting
- Develop reproducible workflows using R Studio and GitHub for version control, project management, and open science practices
- Critically evaluate and interpret the design and analysis of statistical outputs to draw biologically meaningful conclusions
- Integrate ecological theory and statistical methods to design and analyze studies that address animal behavior research questions

Course Overview: This course provides Master's students in Animal Behavior & Conservation with the skills to analyze, interpret, and present data using R in a reproducible and transparent way. Through a combination of lectures, live coding demonstrations, and hands-on exercises, students will learn how to wrangle and visualize data, select and fit appropriate statistical models, and interpret results in the context of behavioral ecology. Emphasis will be placed on reproducible research practices, including the use of RStudio, GitHub, and R Markdown, as well as the critical evaluation of statistical methods in published literature. By the end of the semester, students will be able to apply advanced statistical techniques to their own research questions and communicate findings clearly to both scientific and applied audiences.

Your Expectations of Me: You can expect me to arrive to class and office hours on time, to respond to e-mail messages within 48 hours on business days, to be available during office hours, and to arrange alternative meeting times with you when necessary, to present class material in a clear and organized fashion, and to do my best to help you grasp the material. I appreciate dynamic feedback; if there's something I can change about the class while you're still in it to improve your experience, you can email me or pop an anonymous note in my letterbox (in 611HN) or under my office door (607HN).

Attendance Information: You will not be graded on your attendance, but class work and in-class quizzes make up 45% of the grade combined. If you miss a class activity or quiz you may come to my office hours to work on the activity or quiz and submit it in *the week before or the week after* the missed class.

How to succeed in PSYCH 705:

- PRACTICE coding regularly; repetition in R is key to building fluency.
- COMPLETE in-class exercises and homework on time, pushing your work to GitHub as required.
- REVIEW both the statistical concepts and the R code after each class to reinforce learning.
- PARTICIPATE actively during live coding sessions and discussions – ask questions when something is unclear.
- COLLABORATE and seek help from me or your peers when troubleshooting code or interpreting results.

Using Technology and AI to Code: I encourage students to use technology as a coding companion. I will use GitHub to share lecture slides, lecture recordings, and additional supplementary activities to help you review and learn the material outside of class. ChatGPT and other AI chatbots are good resources for coding (they are much better at coding than writing for example). AI can help you identify useful packages, debug your code, write code for you, and give reproducible code examples. I recommend telling AI your table and variable names so that it generates code that matches what you're working on over trying to share a dataset with AI (which can run into sharing, privacy, and copyright issues). AI can help you understand how or why a particular bit of code works (or doesn't work). However, AI MAKES MISTAKES, even with code. I have had ChatGPT make up an imaginary package and write code with errors and bugs in it that did not actually work when I tried to run it. You are responsible for making sure that your code works and for annotating it properly!

Collaboration and Plagiarism: Science is a collaborative process, and students may always work together on in-class or homework activities. However, students should not simply copy and paste one another's work, and all code annotations should be written individually in your own words. Copying and pasting code is not an effective learning strategy and will be considered copying (plagiarsim). If two students' R scripts are identical or nearly so both students will receive a zero. To reduce the likelihood of getting a zero for plagiarism, please push your code for in-class assignments and homework to GitHub periodically while you're working on it, these creates a chain of evidence for your work as you progressed. While code may often be very similar, you should also do all annotations and hashtags in your own words to ensure your script is your own unique work. You will only be graded on the final version!

Grading:

Letter Grade / Percent Range / GPA

A+	**A**	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**D**	**F**
97.5-100	92.5-97.4	90.0-92.4	87.5-89.9	82.5-87.4	80.0-82.4	77.5-79.9	70.0-77.4	60.0-69.9	0.0 -59.9
4	4	3.7	3.3	3	2.7	2.3	2	1	0

Assessment	**Percent of Final Grade**
Class Work	25%
In-Class Quizzes (5% x 4)	20%
Homework	25%
Coding Project	30%

1. Class Work (25%)

We will use 1-2 hours each class to work on coding activities together. Students may work alone or in groups (but each student should have a copy of the final code with their own unique annotations) and should push their work to GitHub by the end of class (preferably pushing 1-2 times).

2. Quizzes (20%)

There are 4 quizzes scheduled throughout the semester to check students' understanding of statistical concepts and their ability to interpret statistical outputs. These are short quizzes and should take no more than 15 minutes to complete.

3. Homework (25%)

There will be one homework assignment each week that mirrors and builds upon the skills from the lecture and class work. Homework must be pushed to GitHub by the Sunday before the next class at the latest so that I have time to review and comment on student's work before the next class on Tuesday. This also ensures that I know how prepared or ready students are for the next class.

3. Coding Project (30%)

Students will complete an independent coding project near the end of the semester and present their results to the class (as if at a scientific conference). Students may use their own data, data from their lab, or open access data from an online scientific publication. Students should push their code regularly to GitHub after submitting project proposals. Final code should demonstrate what they've learned in class from data import and cleaning to statistical analysis, and visualization. In addition, students will also prepare a PowerPoint presentation with theoretical background, hypotheses, methods, results, and conclusions to share on the last day of class. Final grade will encompass the proposal, GitHub pushes (showing evidence of work and improvement over time), final code, and the presentation.

Class Schedule

Classes are every Tuesday from 5:30pm to 8:20pm. Please note that there is a Monday Schedule for the entire University on Tuesday October 14th and we will not be meeting for class.

	DATE	TOPIC	DEADLINES
1	Tue Aug 26	Introduction to R & Github	
2	Tue Sep 2	Importing, Cleaning, and Visualizing Data	
3	Tue Sep 9	Probability, Simulation, & Descriptive Stats	
4	Tue Sep 16	Hypothesis Testing Refresher	Quiz 1 (Classes 1-3)
	Tue Sep 23	NO CLASS (COLLEGE WIDE)	
5	Tue Sep 30	Simple Linear Regression	
6	Tue Oct 7	Multiple Regression I	
	Tue Oct 14	NO CLASS (Monday Schedule)	
7	Tue Oct 21	Multiple Regression II	Quiz 2 (Classes 4-6)
8	Tue Oct 28	Generalized Linear Models	
9	Tue Nov 4	Generalized Linear Mixed Models	
10	Tue Nov 11	Model Selection, Exploration, & Prediction, Model Averaging	Quiz 3 (Classes 7-9) Project proposals due before class
11	Tue Nov 18	Specialized Models	
12	Tue Nov 25	Structural Equation Modeling	
	Tue Dec 2	In-Class Work on Projects	Quiz 4 (Classes 10-12)
	Tue Dec 9	Final Presentations	Final Code due by 12/15
	Tue Dec 16	Wrap-Up & Review (2 hours)	

Policies and Places

Know your rights! You can find Hunter College & CUNY policies and forms here: https://hunter.cuny.edu/students/student-affairs/office-of-student-conduct/policies-and-forms/

Syllabus Change Policy: Except for changes that substantially affect the implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice. When the syllabus is changed there will be an announcement in class and via email.

Privacy: Do not record and share video or audio of this class without consent from myself and your peers. Student privacy is protected under the Family Educational Rights and Privacy Act (FERPA), you can learn more here: https://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html

ADA Policy: In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, located in Room E1214B, to secure necessary academic accommodations. For further information and assistance, please call: (212) 772- 4857 or (212) 650-3230.

Hunter College Policy on Academic Integrity: Hunter College regards acts of academic dishonesty

(e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures: http://www.hunter.cuny.edu/studentaffairs/student-conduct/academic-integrity/welcome-academicintegrity/?searchterm=integrity

Sexual Misconduct: In compliance with the CUNY Policy on Sexual Misconduct (http://www.hunter.cuny.edu/diversityandcompliance/repository/files/cuny-policy-on-sexualmisconduct.pdf), Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College. a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444). b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.

Counseling & Wellness Services: Counseling Services, a division of Hunter College Counseling & Wellness Services, offers confidential and free short-term counseling to all Hunter College students. For information and appointments contact the Counseling Services in **RoomE1123, call (212)772-4931, or email at PersonalCounseling@hunter.cuny.edu,** http://www.hunter.cuny.edu/cws/counselingservices/welcome

Other campus resources available to students:

The Rockowitz Writing Center: Writing help is available online through the Rockowitz Writing Center: http://www.hunter.cuny.edu/rwc

Mary P. Dolciani Mathematics Learning Center: Statistics help is available through the Dolciani Math Learning Center: http://www.hunter.cuny.edu/dolciani

Career Development Services: http://www.hunter.cuny.edu/studentservices/cds

Childcare for Students, Staff, and Faculty: https://hunter.cuny.edu/students/health-wellness/childrens-learning-center/

Acknowledgements

I recognize that Hunter College, CUNY, is situated on land that was traditionally home to Mohican, Wappinger, and Munsee Lenape people. I also recognize the ongoing systemic injustices within academia; and I commit to working to dismantle these in my teaching and research.