

Instructor

Lynda Aouar, Ph.D.
Lynda.aouar@yale.edu

Meeting Information

- Every Tuesday/Thursday, 1:00 pm- 4:15 pm
- Location: Zoom (link TBA)

Teaching fellows

TBA

Website

On Canvas at: TBA

Office Hours

On zoom. (link TBA)

You are welcome to attend office hours regardless of your progress on a current reading or assignment. Here are some recourses on the importance of attending the office hours:

<https://www.youtube.com/watch?v=2GM1c5Vk2IY>(link is external).

Course Description

An introduction to statistical reasoning. Topics include numerical and graphical summaries of data, data acquisition and experimental design, probability, hypothesis testing, confidence intervals, correlation and regression, goodness of fit tests, and one and two-way ANOVA. Application of statistical concepts to data; analysis of real-world problems, we will use R programming language.

Format

The primary form of instruction would be lectures, conducted through zoom.

Attendance:

Attendance is graded. It will be taken in each zoom class, and a camera on is required. ("Students in online courses are required to attend class sessions on a computer with their video on and in a setting conducive to academic work and class participation. Using a smartphone to attend online classes or logging in without video will count as an absence. Watching asynchronous recordings, if available, does not fulfill the attendance requirement").

Required Materials

Textbook/ *Stats: Data and Models* by De Veaux, Vellman, and Bock (any edition is fine and inexpensive copies of the 4th edition can be readily found). I recommend that you get the book as soon as possible

and begin reading the chapters to have an idea about the course content and get familiarized with the book structure.

Software and Technology

We will regularly use R, both in class and on assignments outside of class. No prior computing experience is needed.

There are two main options to get started:

1. Local install on your computer: download R and then RStudio by following the instructions [here](#)[Links to an external site.](#)
2. Cloud account: [posit Cloud](#)[Links to an external site.](#)

R resources:

- (online book) [An Introduction to R](#)
- (online book) [YaRrr! The Pirate's Guide to R](#)[Links to an external site.](#)

Provide an overview of the readings and assignments associated with your course. Many students find it helpful for planning to have a class-by-class or weekly schedule, which includes number of pages to be read and/or number of minutes to listen to a podcast/watch a video.

Assessments & Grading

Your grades will be based on the following components:

- weekly homework (5 total) : 35%
 - Homework will typically be due 11:59 PM Thursday night in Grade scope (a free grace extension of 24 h)
 - Late homework is not accepted, so plan accordingly.
 - But life happens, so your lowest homework grade will be dropped.
- online quizzes (2 quizzes, 7.5 % each): 15%
- Attendance (the zoom class attendance will be taken, camera on is required) : 5%
- midterm exam: 20 %
 - timed and open note
 - 48-hour window taken online in Canvas
- final exam: Will be comprehensive exam 25% : End of Week 5 (date: TBA)

Academic Integrity

You are encouraged to discuss the homework set with your classmates. Any collaborators need to be cited on your submission. However, the following are not allowed:

1. Copying another student's solution, either in part or in total,
2. Allowing another student to copy your solution, either in part or in total.

Violations of these rules will result in a notification of the Executive Committee.

<https://catalog.yale.edu/undergraduate-regulations/regulations/academic-dishonesty/>[Links to an external site.](#)

“Academic integrity is a core institutional value at Yale. It means, among other things, truth in presentation, diligence and precision in citing works and ideas we have used and acknowledging our collaborations with others. In view of our commitment to maintaining the highest standards of academic

integrity, the Graduate School Code of Conduct specifically prohibits the following forms of behavior: cheating on examinations, problem sets and all other forms of assessment; falsification and/or

fabrication of data; plagiarism, that is, the failure in a dissertation, essay or other written exercise to acknowledge ideas, research, or language taken from others; and multiple submission of the same work without obtaining explicit written permission from both instructors before the material is submitted. Students found guilty of violations of academic integrity are subject to one or more of the following penalties: written reprimand, probation, suspension (noted on a student's transcript) or dismissal (noted on a student's transcript)."

The statement above was provided by Graduate School Dean Lynn Cooley. In this class, we have the same expectations of undergraduate students.

[ChatGPT.](#)

The rapid advance of artificial intelligence (AI) in the last year means that we are in a fluid and fast-changing time for teaching and learning. Right now, the University's policy is "Inserting AI-generated text into an assignment without proper attribution is a violation of academic integrity, and using AI tools in a manner that was not authorized by your instructor may also be considered a breach of academic integrity". While AI may be used as a source of ideas, text generated by ChatGPT etc may not be submitted.

Diversity, Equity, Inclusion, & Belonging

"Our goal as a learning community is to create a safe environment that fosters open and honest dialogue. We are all expected to contribute to creating a respectful, welcoming, and inclusive environment. To this end, classroom discussions should always be conducted in a way that shows honor, respect, and dignity to all members of the class. Moreover, disagreements should be pursued without personal attack and aggression, and instead, should be handled with grace and care. This will allow for rigorous intellectual engagement and a deeper learning experience for all. Lastly, please remember to practice self-care, which, according to Audre Lorde 'is not an act of self-indulgence, it is self-preservation, and that is an act of political warfare.'" (From Dr. Carolyn Roberts, Assistant Professor, History of Science & History of Medicine, and African American Studies, Yale University).

Accessibility

Our institution values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment or achievement, please notify the instructor as soon as possible. Please contact [Student Accessibility Services](#) to discuss a range of options for removing barriers in the course, including accommodations.

Acknowledgements

These class materials were developed based on the work of Dr. Robert Wooster and Dr. Jonathan Reuning-sherer.

Readings & Assignments (Tentative Schedule) :

As follows :

Week	Class	Topic	Reading	Exams/ Quizzes
1	1	Course intro and "What is Stats?"	Ch 1	<ul style="list-style-type: none"> • HW 1 • Quiz 1 (Online)
		Intro to RStudio, Displaying and summarizing data I	Ch 2	
		Displaying and summarizing data II	Ch 3, 4	
	2	Intro to the Normal Distribution	Ch 5	
		Correlation and regression I	Ch 6, 7	
		Correlation and regression II	Ch 8, 9	
2	3	Sampling & Experiments I	Ch 10, 11	<ul style="list-style-type: none"> • HW 2 • Exam 1 (Online)
		Sampling & Experiments II	Ch 11, 12	
		Intro to Probability	Ch 13, 14	
	4	Exam I / catch up	Midterm I	
		Bayes' Rule examples, Random variables, Probability models	Ch 14, 15	
3	5	Central Limit Theorem, sampling distributions	Ch 16, 17	<ul style="list-style-type: none"> • HW 3 • Quiz 2 (Online)
		Confidence intervals, Hypothesis testing I	Ch 18, 19	
	6	Hypothesis testing II, Recap Confidence Intervals and Hypothesis Testing	Ch 20, 21	

4	7	Comparing groups, Paired samples and blocks, Comparing counts, chi-sq tests	Ch 22, 23, 24	• HW 4
	8	Inference for regression, Logistic regression . Exam II / catch up day	Ch 25	
5	9	ANOVA, Multifactor ANOVA	Ch 26, 27	• HW 5 • Final Exam
		Multiple regression I	Ch 28	
	10	Multiple regression II. Final Exam / Catch up for the exam.	Ch 29	