

# STATS 110: Introduction to Statistics for Engineering and the Sciences, Summer 2025

## Course Information

STATS 110 (5 units)  
Summer 2025  
MWF 1:30 PM - 3:15 PM, [370-370](#)  
Link to (Canvas) course website

Prerequisites: MATH20 or AP Calculus AB

## Instructor Contact Information

### Teaching Team

**Primary Instructor:** Wendy Moore (she/her pronouns)  
Email address: [wnmoore@stanford.edu](mailto:wnmoore@stanford.edu)  
Office Hours: TBD  
Preferred method of contact: Send a message on Canvas

**Teaching Assistant:** Jing Shang (she/her pronouns)  
Email address: [jshang21@stanford.edu](mailto:jshang21@stanford.edu)  
Office Hours: Mondays 8 am - 10 am on Zoom ([link](#))

**Teaching Assistant:** Alessandro Sinai (he/him pronouns)  
Email address: [alesinai@stanford.edu](mailto:alesinai@stanford.edu)  
Office Hours: Tuesdays 8 am - 10 am CoDa B06

## Course Overview/Description

Introduction to statistics with examples drawn from various fields, including the sciences, engineering, and social sciences. Collecting data (random sampling, randomized experiments); describing data (numerical and graphical summaries); discrete and continuous probability models; statistical inference (hypothesis tests and confidence intervals). Use of software to conduct probability simulations and data analysis.

## Course Learning Goals

Through active engagement and completion of course activities, you will be able to:

- summarize data using descriptive statistics and visualization;
- select appropriate probability models and estimate model parameters;
- make conclusions about a population using real data by applying statistical inference techniques;
- write human readable code using R.

## Course Materials

**Technology:** You will need to have access to a device that connects to the internet so that you can access email, Canvas, and Zoom. All course details and materials will be posted on our Canvas course site. Students can borrow equipment and access other learning technology from [the Lathrop Learning Hub](#). For tech support, see [Student Tech Resources and Support](#).

### Recommended Textbooks:

Diez , Barr, Cetinkaya-Rundel OpenIntro Statistics, 3rd edition, Creative Commons license. Visit [openintro.org](https://openintro.org) for a free pdf or [amazon.com](https://amazon.com)

Navidi, W. C. (2020). Statistics for engineers and scientists (Fifth edition.). McGraw-Hill Education.

Mendenhall, W. M., & Sincich, T. L. (2015). Statistics for engineering and the sciences (6th ed.). Chapman & Hall/CRC.

## Coursework and Grading Scheme

Category	% of course grade	Notes
Attendance and participation in class	15%	<ul style="list-style-type: none"><li>• 2 absence 'passes', no questions asked</li><li>• Arrival &gt;15 mins late counts as an absence</li><li>• Must submit work done in class for attendance credit</li></ul>
Homework	25%	<ul style="list-style-type: none"><li>• Weekly video quizzes to be completed before class</li><li>• Weekly assignments done through Canvas</li><li>• Will require submission of R code and output</li></ul>
Midterms	25%	<ul style="list-style-type: none"><li>• Two midterms, in class open notes (but notes MUST be on paper - typed or handwritten)</li></ul>
Final Group Project	35%	<ul style="list-style-type: none"><li>• Proposal (10 points)</li><li>• Presentation (30 points)</li><li>• Written Summary (30 points)</li><li>• R code (10 points)</li><li>• Peer evaluations (20 points)</li></ul>

## **Course Policies**

### **Teaching Philosophy**

We will be using a flipped classroom approach in this course. This means that in class we will be working on problems and doing group work and at home you will be watching lecture videos and completing any assignments not finished in class. Statistics education researchers have performed many studies investigating the benefits of a flipped class and active learning. See [this peer-reviewed paper](#) for more information.

### **Presence and Participation**

Thinking through difficult issues is most productive and most fun when done out loud in the company of others! This is why attendance and participation is a large part of your course grade (15%).

- You get 2 'passes' to be absent from class or section, no questions asked.
- Being 15 minutes or more late to a class or section counts as an absence.
- Even if an absence is excused, any work due at that class/section is subject to the policies below.
- Students who anticipate persistent challenges to participating in class or submitting work on time should share this in our pre-course survey and follow up with a course instructor as soon as possible.

### **Deadlines and Late Submissions**

Assignment deadlines are listed in the course schedule, along with estimated times of completion, to enable you to effectively plan and balance your academic work and other commitments. Despite the best planning, however, we know that life happens!

Please do not stress about turning in a single assignment on time. If you need an extension, you can request it using this Google Form (link). I will try to respond within 12 hours of your request. An important note: you can only request an extension *before* the due date of the assignment. The latest I will accept a request is *2 hours before* the assignment due date. If you are consistently requesting extensions (e.g. 3 times in a row), the instructor will email you to set up a meeting to discuss your time management and suggest resources for staying on track.

### **The Honor Code**

Class meetings and sections in this course will be highly interactive, you will hear plenty of great ideas from your peers, and if things go as planned, you might even change your mind based on what others say! However, you will be evaluated in this course as an individual and are expected to cite sources and individuals from whom you have learned and borrowed as a display of academic, intellectual, and creative integrity. In addition, while we encourage collaboration during class activities and assignments as an aid to your learning (with collaborators and their contributions cited in submissions), we expect you to complete the two exams in the course without using

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the internet, to demonstrate your proficiency with course material.

Failure to abide by these expectations is a violation of Stanford's Honor Code and is a serious offense, even when the violation is unintentional. Conduct prohibited by the Honor Code includes all forms of academic dishonesty, among them unpermitted collaboration and representing others' work as one's own. Please review [Stanford's Honor Code](#), and [documentation and citation resources](#) from the Hume Center for Writing and Speaking. When in doubt, contact your TA's or instructor.

### Course Policies for Use of Generative AI

Depending on the context, artificial intelligence (AI) can either enhance and impede learning. There are times when these tools might provide us with new ideas and understandings (e.g., brainstorming or getting feedback). At other points, practicing skills and synthesizing ideas on our own will be crucial for the learning process. Thus, being mindful of when to use these tools will help us navigate the complexity of interacting with AI technologies in the classroom and beyond.

At the beginning of the course, we will co-create a class agreement on the use of AI tools that ensures everyone has equal access to such tools and knowledge of their benefits and limitations; understands the appropriate use of them; and is clear on policies and procedures for their use (including proper citation), and how they connect to the idea of academic integrity. Our class agreement will be consistent with [guidance from the Board of Judicial Affairs](#) regarding use of AI and the Stanford Honor Code, which notes that use of generative AI to "substantially complete" an assignment or exam by entering the prompt and submitting the output as one's own work is **not permitted**.

### Course Privacy Statement

As noted in the university's [recording and broadcasting courses policy](#), students may not audio or video record class meetings without permission from the instructor (and guest speakers, when applicable). If the instructor grants permission or if the teaching team posts videos themselves, students may keep recordings only for personal use and may not post recordings on the Internet, or otherwise distribute them. These policies protect the privacy rights of instructors and students, and the intellectual property and other rights of the university. Students who need lectures recorded for the purposes of an academic accommodation should contact the [Office of Accessible Education](#).

## **Accommodations**

Stanford is committed to providing equal educational opportunities for differently abled students. If you experience disability, please register with the Office of Accessible Education (OAE). Professional staff will evaluate your needs, support appropriate and reasonable accommodations, and prepare an Academic Accommodation Letter for faculty. To get started, or to re-initiate services, please visit [oe.stanford.edu](http://oe.stanford.edu).

If you already have an Academic Accommodation Letter, we invite you to share your letter with us. Academic Accommodation Letters should be shared at the earliest possible opportunity so we may partner with you and OAE to identify any barriers to access and inclusion that might be encountered in your experience of this course.

Student athletes who anticipate challenges in being able to participate in class or submit assignments on time should speak to a course instructor or teaching assistant as soon as possible about available alternatives or allowances.

## **Resources**

There are campus resources, such as [accommodations](#), [undergraduate advising directors](#), [well-being coaches](#) and [resources](#), [counselors](#), [academic coaches](#), [Hume Center writing tutors](#), and the [FLI opportunity fund](#) for broader needs you might have. If there are additional ways we can support you in the course, please feel encouraged to reach out to us. Without requesting or expecting details of your situation, we will do everything we can to ensure your course learning is productive and enjoyable.

## **Diversity Statement**

It is my intent that students from all diverse backgrounds, perspectives, and situations be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity, which may include but is not limited to: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, religion, political affiliation, culture, and so on. I acknowledge that there is likely to be a diversity of access to resources among students and plan to support all of you as best as I can. Please let me know ways to improve the effectiveness of the course for you personally or for other students or instances. We wish to proceed thoughtfully, providing support to all of those affected, while also affirming that we value differences, free expression and debate as sources of strength for our community. Please visit [titlevi.stanford.edu](http://titlevi.stanford.edu) to submit a report.

## Course Schedule

*Subject to change, based on student feedback and input*

Week	Date	Topic	Assignments
1	6/23-6/27	<b>Sampling Methods, Study Design, Type of Variables</b>	About You Survey due 6/27 HW 1 due 6/30
2	6/30-7/4	<b>Summarizing and Visualizing Variables Intro to Probability</b> (No class Friday 7/4)	HW 2 due 7/7
3	7/7-7/11	<b>Random variables and probability distributions</b>	HW 3 due 7/14
4	7/14-7/18	MLEs	<b>Midterm 1 on Friday, July 18th</b> HW 4 due 7/21
5	7/21-7/25	<b>Sampling Distributions</b>	HW 5 due 7/28
6	7/28-8/1	<b>Hypothesis Testing</b> <i>Final Project Instructions</i>	HW 6 due 8/3 Project groups assigned
7	8/4-8/8	<b>Regression</b> <i>Feedback on projects + time to work in class</i>	<b>Midterm 2 Monday, August 4th</b> HW 7 due 8/11 Project Proposal due 8/6
8	8/11-8/15	<b>Final Projects</b> <i>Presenting &amp; Reporting Statistical Data</i>	Final Presentations in class on 8/15