

ENVS 193DS: Statistics for Environmental Science

Spring 2025

Class times

	Day	Time	Location
Lecture	Monday, Wednesday	12:30 - 1:45 PM	Phelps 1260
Workshop	Thursday (Thuy-Tien)	4:00 - 4:50 PM	ILP 3310
	Thursday (Thuy-Tien)	5:00 - 5:50 PM	ILP 3310
	Friday (Grace)	9:00 - 9:50 AM	HSSB 1207
	Friday (Grace)	10:00 - 10:50 AM	HSSB 1224

Course logistics

	Instructor: An Bui	TA: Grace Lewin	TA: Thuy-Tien Bui
Email	Note: please include "ENVS 193DS" in the subject line of all emails!		
	an_bui@ucsb.edu	glewin@ucsb.edu	thuy-tienbui@ucsb.edu
Drop-in hours	Wednesdays 3:30 - 5:30 PM	Friday 11am-12pm	Thursdays 2:00 - 3:00 PM
Drop-in hours location	At the tables outside the UCen 1st floor (facing the lagoon)	Library 6541 (group study room, 6th floor, ocean side)	At the tables outside the UCen 1st floor (facing the lagoon)
Learn more about me	https://an-bui.com/		https://thuy-tienbui.github.io/

Note: in case of rain, An and Thuy-Tien's drop-in hours will be *inside* the UCen 1st floor at the food court tables.

Learning goals

By the end of the quarter, you will be able to:

- 1) Describe basic concepts of probability and statistics
- 2) Identify appropriate statistical analyses to test hypotheses
- 3) Conduct statistical analyses and visualize data using the R programming language
- 4) Implement best practices for reproducible analysis and collaborative work
- 5) Interpret and contextualize statistical results in general concepts from environmental studies

Course expectations

What you can expect from An, Grace, and Thuy-Tien:

- 1) Detailed instruction during class time on statistical and data science concepts
- 2) Responses and feedback posted on Canvas for all assignments and exams
- 3) Timely responses to emails sent Monday-Friday within 36 hours
- 4) Open drop-in hours to ask questions about the course and any/all other topics (research, grad school, undergrad, etc.) and one-on-one meetings as needed
- 5) Compassion and empathy regarding personal situations

What is expected of you:

- 1) Engagement with the class as a community by attending class meetings and participating in class
- 2) Open and respectful communication with your classmates
- 3) Open and respectful communication with An, Grace, and Thuy-Tien
- 4) Effort in completing assignments to the best of your ability by following the guidelines and allotting the appropriate time to each
- 5) Ask questions when they come up in class so that everyone has the answer at the same time

Ways to get in touch

Please feel free to communicate about any questions, comments, or concerns you have with the class, or if you want to talk about getting involved in research, going to grad school, etc.

- **Drop-in hours** are open times when we are available to meet with anyone to discuss anything - there is no structure, just *drop in*!
- **One-on-one meetings** are made on an as needed basis (for example, if you can't make it to drop-in hours) based on your and our (either An, Grace, or Thuy-Tien's) availability.
- An **anonymous questions/comments/concerns** form is available [here](#), and an anonymous discussion forum is available on Canvas for anything you want to let me know that you don't necessarily want your name attached to.

Course tools

Software: We will be using the programming language R and the associated user interface RStudio in this class. R and RStudio only work on computers (not tablets). If you have a computer, you should have 1) R, 2) RStudio, and optionally 3) a campus VPN installed before class.

- Download R [here](#)
- Download RStudio [here](#) (**Note: you must install R before RStudio!**)
- [Instructions for installing a VPN](#)

If you have installed R or RStudio for other classes, you should update both before this class. An will be using R version 4.4.3 ("Trophy Case", released 2025-02-28) and RStudio version 2024.12.1+563 (released 2025-02-13).

Don't have access to a computer? You can run RStudio using the [virtual machine](#) on any device (for example, a tablet or iPad, or a computer checked out from the library). For help using the virtual machine, see the [class resource page](#).

Additionally, desktop computers in the library's [DREAM lab](#) and campus [Collaborate labs](#) have R and RStudio installed and are available for your use.

Please let An know immediately if none of these options work for you.

Grade breakdown

Homework: 35%

Homework assignments provide the opportunity to practice coding skills you learn in class. Feel free to talk with classmates to figure out problems together; however, you are expected to write all your own code, comments, and responses to questions.

Take home exams: 35%

Take home exams are tasks you will do to create a finished product, building on concepts covered in class and testing your ability to handle these independently. Like homework, you are welcome to talk with classmates to solve problems, but you are expected to do your own work.

Choose your own assignment: 10%

This is an assignment that allows you to explore one of two topics: a) creating a website using Quarto or b) creating a data storytelling product. Choose which one you want to complete based on your own interests. These are graded on a satisfactory/not satisfactory basis, where a "satisfactory" grade will earn the full 10%, and the "not satisfactory" grade will earn 5%.

Reflections: 10%

Course reflections are designed for you to assess your learning and progress *independently* of your grade in the class. These are graded based on completeness.

Engagement and participation: 10%

Your course engagement is based on participation and communication with your classmates and me. This includes but is not limited to: participating in small group discussions in class, asking questions in class/via email, and completing assignments to the best of your ability.

Late submissions and resubmission

Late submissions

For any late submissions, you have **one (1)** free pass. To use this free pass, email An letting her know

- 1) what you need to turn in late, and
- 2) when you will turn it in.

Requests to use your free pass *after* the assignment due date will not be accepted. For all other late submissions after you have used your free pass, you will receive a *30% deduction*. *No submissions will be accepted more than a week after the original due date.*

Resubmission

If you did not earn the grade you expected on your midterm or “choose your own” assignment, you have **one (1)** opportunity to revise and resubmit. See [these guidelines](#) for how to resubmit an assignment.

Once you resubmit your midterm or assignment, An will regrade the whole submission. ***There is no guarantee of a higher grade.*** Additionally, there are *no* resubmission opportunities for the final.

What to do if you miss class

People need to miss class for all kinds of reasons - life happens! If you need to miss class:

- review lecture slides and/or workshop materials
- if you missed workshop, work through the code on your own
- get notes from classmates

You do not need to email to say why you are missing class.

Tentative schedule

Topics

Week	Lecture (Monday and Wednesday)	Workshop (Thursday/Friday)
1	Course introduction; statistics, data science, and environmental studies; types of data and sampling; describing data; exploring data; distributions and	Basics of using R/RStudio, data summarizing, data visualization

	probability	
2	Probability distributions continued; expressing uncertainty; statistics in research	Continuing data visualization, visually communicating uncertainty, using Quarto or RMarkdown
3	Basics of hypothesis testing; Central Limit Theorem; types of statistical tests; t-tests (one and two sample)	t-tests in R
4	Types of errors, power, and experimental design; beyond p-values; figures and captions	Ugly plots
5	Analysis of variance; non-parametric tests and effect sizes	ANOVA and non-parametric tests
6	Chi-square; data visualization; no class on Wednesday (midterm)	No workshop
7	Linear relationships	TBD
8	Regression part 2: multiple linear regression, model selection	Git/GitHub, correlation and model diagnostics, visualizing predictions
9	No class on Monday; bias, generalized linear models intro	Model predictions and tables
10	Generalized linear models (logistic and count), the expansive world of statistics	Personal data (required for final)

Due dates

We will talk about all assignments in class on Mondays. All assignments are due in the following weeks on Wednesdays at 11:59 PM unless otherwise noted.

Week	Assigned	Due
1	Check in (optional), reflection 1	Check in (optional)
2	Homework 1	Reflection 1 (due Sunday 6 April)
3	Homework 2	Homework 1
4		Homework 2 (due Friday 25 April)
5	Midterm	

6	Reflection 2	Midterm
7	Choose your own assignment	Reflection 2
8	Homework 3	Choose your own assignment check-in (optional)
9		Homework 3, choose your own assignment check-in (required)
10	Final, reflection 3	Choose your own assignment (final)
Finals	Final + reflection 3 due at 11:59 PM on Wednesday 11 June	

Resources

- [Disabled Students Program](#): testing accommodations, note-taking help
- [Counseling & Psychological Services](#): mental health care and counseling
- [Resource Center for Sexual & Gender Diversity](#): resources to support members of the LGBTQIA+ community
- [Associated Students Food Bank](#): main food pantry on second floor of UCen (register with the food bank for free produce, pantry staples, and healthcare products!)