

STAT 7

Statistical Methods for the Biological, Environmental, and Health Sciences Winter, 2024

Instructor: Dr. Zehang “Richard” Li

E-mail: lizehang@ucsc.edu

Office: 537B, Engineering Building 2

TA: Jocelyn Chen

TA: Elizabeth Hudson

TA: Vikram Srinivsan

Course Meeting Times: 10:40AM – 11:45PM M/W/F

Location: Humanities Lecture Hall

Website: Through Canvas

Discussion Sessions:

A We 8:00 – 9:05 AM. Earth & Marine B210

B We 1:20 – 2:25 PM. E2 192

C Fr 2:40 – 3:45 PM. E2 194

D Fr 4:00 – 5:05 PM. Cowell Classroom 131

E Th 7:10 – 8:15 PM. E2 192

F Mo 5:20 – 6:25 PM. N. Sci Annex 103

Office Hours:

- Zehang “Richard” Li: Tu 9:00 – 10:00 AM, on Zoom.
- Jocelyn Chen: See Canvas
- Elizabeth Hudson: See Canvas
- Vikram Srinivsan: See Canvas

LSS STAT Study Hall Tutors: There is tutoring available for this class, provided by Learning Support Services (LSS) Study Hall (<https://learningsupport.ucsc.edu/programs/study-hall/>). Learning Support Services Tutors are an important part of the teaching team and are here to help you be successful. Tutoring is for everyone and open to all students in class to get extra practice on the things you already know or the things you want to know better. Your tutor(s) is an undergraduate student who took the class, did well, and received extensive training on how to help you learn! Sessions are one-hour long, available several days a week and attendance is voluntary.

Course Description: This is an introduction to statistical methods as practiced in the biological, environmental, and health sciences. The aim of this course is to understand how a statistical analysis is performed and to learn how the results from a statistical study are interpreted. We will begin with a general discussion of the steps involved in a statistical study, and how to summarize information in a data set. Then we will introduce concepts of probability and discuss some specific probability distributions. Later, we will move to inference for means and proportions from a population, specifically we will talk about interval estimation, hypothesis testing for one and two samples, power, and sample size. Finally, we will cover simple and multiple linear regression, Goodness-of-Fit, and one-way analysis of variance.

Textbook and Course Materials: Introductory Statistics for the Life and Biomedical Sciences (1st Edition), by Julie Vu and David Harrington. (Free PDF download at <https://www.openintro.org/book/biostat/>).

Prerequisites: Score of 300 or higher on the mathematics placement examination (MPE), or AM 3 or AM 6 or AM 11A or AM 15A or MATH 3 or MATH 11A or MATH 19A.

Assessment and Grading:

- Lecture participation (5%): Each student will be randomly assigned to a group of around 10 to 12 students. Students of the same group will receive the same participation points. Participation points are earned through activities during lectures. The final score of participation will be converted from the cumulative scores for each group.
- Homework (20%). There will be weekly homework sets due on Fridays. The homework is graded **by completion**. There will be random calls during Discussion Sections to check answers. If you are not present, half of the points for the homework will be deducted. The lowest homework grade will be dropped.
- ‘AI and Me’ homework (15%). There will be about 5 additional homework exercises that focus on using AI to facilitate active and personalized learning. More details will be announced during the quarter.
- Midterms (25%). We will have one midterm exams during class time, tentatively on 10/29. The exam will be 60 minutes long. The exam will be closed-book exams. You can bring a one-page formula sheet.
- Final (35%). We will have one final exam during the Finals week on 12/9 at 4PM. The exam will be 90 minutes long. The final exam will be a closed-book exam. You can bring a one-page formula sheet.

Extra credits

There will be extra credit opportunities. Extra credit is a way to help you through any difficulty that you might encounter and to support you in case you miss some assignments. Note, however, there will be no curves, no rounding, no extra assignments, and no changes when the final grades are posted.

- Syllabus Quiz (1%) A quiz about the syllabus.

- Mid Quarter Survey (2%) A survey to see what's working and what's not.
- SETs (2%). If more than 75% of the class completes them before the deadline.

Course Letter Grade: We will use the following letter grade conversion table. It may be slightly adjusted at the end of the course.

Letter	Score	Letter	Score
A+	[100, 105]	C+	[70, 75)
A	[95, 100)	C	[60, 70)
A-	[90, 95)	D	[50, 60)
B+	[85, 90)	F	[0, 50)
B	[80, 85)		
B-	[75, 80)		
P	[65, 110]	NP	[0, 65]

Late and missed homework/quiz/exam policy

- Both types of homework: late homework will lose 1 point per day. No extension will be granted.
- If you miss the midterm exam without acceptable, well-documented reason, then you will get 0 points. If you have an acceptable, well-documented reason, then the midterm exam will not count towards your score, and your other quizzes or final exam will be re-weighted to make up the difference. If you are participating in an official UCSC activity that causes you to be away on the day of the midterm exam, and you let us know in advance, then we will reschedule the quiz or midterm exam for you.
- No makeup final exam is provided, unless in truly extraordinary circumstances, where an incomplete grade will be assigned, and a makeup final exam (on paper or an oral exam) may be offered instead in the Spring quarter.

Attendance: Attendance of lecture and the Discussion Section is strongly recommended. During the Discussion Sections, TAs will solve problems from the set of exercises that will be posted on **Canvas**. There will be random calls during Discussion Sections to check answers. If you are called on to explain the homework and you do not show up, you will lose the point for the homework problem.

Communication: The course webpage (through **Canvas**) will serve as an archive of all materials and announcements. Please use the **Canvas** discussion board to ask questions about homework or other course topics. *Please do NOT email the instructor or TAs for questions related to course logistics and materials.*

Lab Section (STAT 7L): STAT7L is required to enroll in this class but consider it a separate class. Covered material between STAT7 and STAT7L roughly match, but the focus of both classes are different.

Tips to Succeed in This Course:

- Read the suggested chapters from the textbook every week.
- Attend class, and be an active participant during lectures and discussion sessions.
- Read the syllabus and understand the evaluation of the class.
- Work on the HW problems weekly; this will make studying for the exams very easy. Find a study group and commit to it; this will make the work easier. Learning is always better with a learning community.
- Work on your formula sheet every week. Include theorems, definitions, formulas, and properties discussed in each class.
- Don't leave questions about the material unanswered; you have office hours from the TAs and the instructor to ask them.
- If you feel like you are getting lost in the class, attend the MSI tutoring sessions: <https://lss.ucsc.edu/lss-tutor-hub/index.html>

Academic Integrity

All members of the UCSC community benefit from an environment of trust, honesty, fairness, respect, and responsibility. You are expected to present your own work and acknowledge the work of others in order to preserve the integrity of scholarship.

Academic integrity includes:

- Following exam rules
- Using only permitted materials during an exam
- Viewing exam materials only when permitted by your instructor
- Keeping what you know about an exam to yourself
- Incorporating proper citation of all sources of information
- Submitting your own original work

Academic misconduct includes, but is not limited to, the following:

- Disclosing exam content during or after you have taken an exam
- Accessing exam materials without permission
- Copying/purchasing any material from another student, or from another source, that is submitted for grading as your own
- Plagiarism, including the use of Internet material without proper citation. This includes using any LLM such as ChatGPT to generate your responses to assignments.
- Using cell phones or other electronics to obtain outside information during an exam without explicit permission from the instructor

- Submitting your own work in one class that was completed for another class (self-plagiarism) without prior permission from the instructor.
- Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student's transcript. For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the Academic Misconduct page at the Division of Undergraduate Education.

Principles of Community

The University of California, Santa Cruz expressly prohibits students from engaging in conduct constituting unlawful discrimination, harassment or bias. More here. I am committed to providing an atmosphere for learning that respects diversity and supports inclusivity. We need to work together to build this community of learning. I ask all members of this class to:

- be open to and interested in the views of others
- consider the possibility that your views may change over the course of the term
- be aware that this course asks you to reconsider some “common sense” notions you may hold
- honor the unique life experiences of your colleagues
- appreciate the opportunity that we have to learn from each other
- listen to each other's opinions and communicate in a respectful manner
- keep confidential discussions that the community has of a personal (or professional) nature
- ground your comments in the texts we are studying. Refer frequently to the texts and make them the focus of your questions, comments, and arguments. This is the single most effective way to ensure respectful discussion and to create a space where we are all learning together.

Accessibility

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by email, preferably within the first two weeks of the quarter. At this time, I would like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC services to contact the DRC by phone at 831-459-2089 or by email at drc@ucsc.edu.

Intellectual Property

The materials in this course are the intellectual property of their creators. As a student, you have access to many of the materials in the course for the purpose of learning, engaging with your peers in the course, completing assignments, and so on. You have a moral and legal obligation to respect the rights of others by only using course materials for purposes associated with the course. For instance, you are not permitted to share, upload, stream,

sell, republish, share the login information for, or otherwise disseminate any of the course materials, such as: video and audio files, assignment prompts, slides, notes, syllabus, simulations, datasets, discussion threads. Conversely, any materials created solely by you (for example, your videos, essays, images, audio files, annotations, notes) are your intellectual property and you may use them as you wish.

Religious Accommodation

UC Santa Cruz welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request reasonable accommodation for religious practices. The instructor will review the situation in an effort to provide a reasonable accommodation without penalty. You should first discuss the conflict and your requested accommodation with your instructor early in the term. You or your instructor may also seek assistance from the Dean of Students office.

All-gender restrooms

UC Santa Cruz is committed to the well-being of all students and cares about all students feeling safe and welcome, regardless of their gender identity, expression, and/or embodiment. The Lionel Cantú Queer Center has worked with students and campus staff to create more safe and accessible restrooms for transgender and genderqueer students, staff, faculty, alumni, and UCSC visitors. A complete list of all-gender restrooms on campus was compiled and is maintained by the Cantú Queer Center: <https://genderinclusive.ucsc.edu/inclusive%20facilities/images/gif-list-5-17-17.pdf>

Title IX/CARE Advisory

UC Santa Cruz is committed to providing a safe learning environment that is free of all forms of gender discrimination and sexual harassment, which are explicitly prohibited under Title IX. If you have experienced any form of sexual harassment, sexual assault, domestic violence, dating violence, or stalking, know that you are not alone. The Title IX Office, the Campus Advocacy, Resources & Education (CARE) office, and Counseling & Psychological Services (CAPS) are all resources that you can rely on for support.

Please be aware that if you tell me about a situation involving Title IX misconduct, I am required to share this information with the Title IX Coordinator. This reporting responsibility also applies to course TAs and tutors (as well to all UCSC employees who are not designated as “confidential” employees, which is a special designation granted to counselors and CARE advocates). Although I have to make that notification, you will control how your case will be handled, including whether or not you wish to pursue a formal complaint. The goal is to make sure that you are aware of the range of options available to you and that you have access to the resources you need.

Confidential resources are available through CARE. Confidentiality means CARE advocates will not share any information with Title IX, the police, parents, or anyone else without explicit permission. CARE advocates are trained to support you in understanding your rights and options, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and more. You can contact CARE at (831) 502-2273 or care@ucsc.edu.

In addition to CARE, these resources are available to you:

- If you need help figuring out what resources you or someone else might need, visit the Sexual Violence Prevention & Response (SAFE) website, which provides information and resources for different situations.
- Counseling & Psychological Services (CAPS) can provide confidential counseling support. Call them at (831) 459-2628.
- You can also report gender discrimination and sexual harassment and violence directly to the University's Title IX Office, by calling (831) 459-2462 or by using their online reporting tool.
- Reports to law enforcement can be made to the UC Police Department, (831) 459-2231 ext. 1.
- For emergencies, call 911.

Report an Incident of Hate or Bias

The University of California, Santa Cruz is committed to maintaining an objective, civil, diverse and supportive community, free of coercion, bias, hate, intimidation, dehumanization or exploitation. The Hate/Bias Response Team is a group of administrators who support and guide students seeking assistance in determining how to handle a bias incident involving another student, a staff member, or a faculty member. To report an incident of hate or bias, please use the following form: Hate/Bias Report Form.

Counseling and Psychological Services

Many students at UCSC face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

Student Success and Engagement Hub

The Division of Student Success provides campus-wide coordination and leadership for student success programs and activities across departments, divisions, the colleges, and administrative units.

Slug Support Program

College can be a challenging time for students and during times of stress it is not always easy to find the help you need. Slug Support can give help with everything from basic needs (housing, food, or financial insecurity) to getting the technology you need during remote instruction. To get started with SLUG Support, please contact the Dean of Students Office at 831-459-4446 or you may send us an email at deanofstudents@ucsc.edu.

Slug Help/Technology

The ITS Support Center is your single point of contact for all issues, problems or questions related to technology services and computing at UC Santa Cruz. To get technological help,

simply email help@ucsc.edu.

On-Campus Emergency Contacts

Slug Help/Emergency Services. For all other help and support, including the health center and emergency services, start here (<https://www.ucsc.edu/help/>). Always dial 9-1-1 in the case of an emergency.