

# STAT 7: Statistical Methods for the Biological, Environmental, and Health Sciences

## Summer 2024

### Instructor

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### Teaching Assistant

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*Name:* Antonio Aguirre  
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*Office Hours:* 12:00 PM - 2:00PM (E2 556)

### Class Information

*Dates:* Monday/Wednesday  
*Time:* 1:00 PM – 4:30 PM  
*Classroom:* Merrill Acad 102

### Discussion Section

Section A (Wed 10:00 AM – 11:00 AM, Cowell Com 134)  
Section B (Fri 10:00 AM – 11:00 AM, Cowell Acad 113)

### Course Description

This is a case-study based introduction to statistical methods for 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. The course will include a general discussion of the steps involved in a statistical study, and how to summarize information in a data set. It will introduce concepts of probability as well as some specific probability distributions. Next, it will consider inference for means and proportions from a population. Specifically we will cover 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

*Biostatistics for the Biological and Health Sciences (2nd Edition)*, M. M. Triola, M. F. Triola, J. Roy.

Pearson (2017). The textbook is not required for quizzes and exams, but highly recommended. Additional ungraded practice/review exercises will be assigned from the textbook. If you have another edition, it is likely to work too. But it is your responsibility to get the practice exercises from this edition.

### **Prerequisites**

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

### **Assessment and Grading**

- Quizzes (40 %). There will be 4 quizzes on Canvas. Once every week except the last week. The quiz will be available from 8:00 AM on the Thursday of that week and due at 11:59 AM on the Monday of the following week. Once you start, you will have 100 minutes to finish.
- Midterm Exam (30 %). The exam will be online through Canvas. It will be posted on Wednesday, Aug 14th and due by next Monday (Aug 19th).
- Final Exam (30 %). The exam will be in person at the last day of lecture (Aug 28th). It will be a two-hour exam.

Late submissions of quizzes and exams will NOT be accepted or given partial credits, unless in truly exceptional circumstances. There will be no make-up quizzes or exams.

### **Course Expectations**

Although attendance is not required, it is strongly recommended. Students may work together on the ungraded homework, but all quizzes and exams should be done individually. Students should never copy solutions from other students or outside sources.

### **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. You may email the instructor for questions related to course materials and grading.

### **Grade Scale**

Final grades will be assigned according to the following scale:

A	93 – 100	C+	77 – 79
A-	90 – 92	C	73 – 76
B+	87 – 89	C-	70 – 72
B	83 – 86	D	60 – 69
B-	80 – 82	F	0 – 59

## Lab Section (STAT 7L)

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

## Tentative Schedule

The following is a *tentative* schedule for the course.

Date	Topics	Book Chapter(s)
07/29	Statistical thinking, data, and data collection	1,2
07/31	Summarizing data	3
08/05	Probability and Uncertainty	4
08/07	Random variables and probability distributions	5
08/12	Normal probability distributions	6
08/14	Normal probability distributions	6
08/19	Estimating parameters	7
08/21	Hypothesis testing	8,9
08/26	Correlation and regression	10
08/28	Multiple regression, goodness-of-fit and analysis of variance	10,11,12

## Campus advocacy resources & education

Title IX prohibits gender discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking. If you have experienced sexual harassment or sexual violence, you can receive confidential support and advocacy at the Campus Advocacy Resources and Education (CARE) Office by calling (831) 502-2273. In addition, Counseling and Psychological Services (CAPS) can provide confidential, counseling support, (831) 459-2628. You can also report gender discrimination directly to the University's Title IX Office, (831) 459-2462. Reports to law enforcement can be made to UCPD, (831) 459-2231 ext. 1. For emergencies call 911. Faculty and Teaching Assistants are required under the UC Policy on Sexual Violence and Sexual Harassment to inform the Title IX Office should they become aware that you or any other student has experienced sexual violence or sexual harassment. If you prefer to speak to someone confidentially, please contact UC Care (see above).

## Support for Students with Disabilities

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 appointment, preferably within the first week of the summer session. At this time, I would also 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 DRC by phone at 831-459-2089 or by email at [drc@ucsc.edu](mailto:drc@ucsc.edu).

## Support for Students with Other Difficulties

While we sincerely hope that you will be able to pursue your studies peacefully and worry-free, we are aware that in some cases difficulties happen that are beyond your control. You should always feel free and comfortable to bring up any problem with the instructor, but if this is not sufficient, or if you prefer professional help, here are several campus resources that you may want to consider contacting:

- UC Care which is a confidential space to discuss issues of dating violence, sexual assault and stalking.
- Slug Support where you can ask for help on many practical issues, including dealing with a financial crisis, problems with your living situation, computers, books, etc.
- CAPS, which provides counseling and psychological services to students.

### **Academic Integrity**

Academic integrity is the cornerstone of a university education. Academic dishonesty diminishes the university as an institution and all members of the university community. It tarnishes the value of a UCSC degree. All members of the UCSC community have an explicit responsibility to foster an environment of trust, honesty, fairness, respect, and responsibility. All members of the university community are expected to present as their original work only that which is truly their own. Plagiarism of any kind is unacceptable. All members of the community are expected to report observed instances of cheating, plagiarism, and other forms of academic dishonesty in order to ensure that the integrity of scholarship is valued and preserved at UCSC. Any student found in violation of the UCSC Academic Integrity policy may face both academic sanctions imposed by the instructor of record and disciplinary sanctions imposed by the graduate division. 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 Integrity page at the Division of Undergraduate Education or Graduate Division ([https://ue.ucsc.edu/academic\\_misconduct](https://ue.ucsc.edu/academic_misconduct)). **No cheating will be allowed and will be sanctioned with the lowest score (0%) with no possibility of dropping that grade from the final grade.**

### **Academic Integrity**

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.