

Instructor: Dan Spencer
 Email Address: daspence@ucsc.edu
 Office Hours: MW 1:00 - 2:00pm, Baskin Engineering (BE) 123

Course Description: This course introduces probability and statistics with an emphasis on applications to the natural and social sciences. Statistical methods provide tools for understanding and appropriately accounting for variability, which naturally comes with data. We will discuss how to collect and analyze data to reach scientifically sound conclusions. While you will learn to do various calculations, our principal goal is to learn how to think critically when faced with data as evidence, select appropriate tools, and be able to interpret (numerical) results.

Lectures: MWF 9:00am - 11:30am, Earth and Marine Sciences, Room B214.

Web page: The course is hosted on *Canvas* (<https://canvas.ucsc.edu>), where you can log in using your Gold ID and password. Check *Canvas* frequently for announcements, schedule, homework assignments, posted class materials, and grades.

Recommended text: *Biostatistics for the Biological and Health Sciences*, Triola, Triola, and Roy, Pearson 2nd Edition (2017).

Discussion Sections: The TA will work through homework problems or other examples and answer questions. Attendance is optional, but strongly encouraged.

Discussion	Time	Location
DIS 01A	Tu 9:30 - 10:30	TBD

Teaching Assistant:

Name	Email	Office Hours	Location
Laura Baracaldo	lbaracal@ucsc.edu	Tu 10:30 - 12:30	Baskin Engineering, Room 312 C/D

Computer Labs: The online lab course **AMS 7L** is a co-requisite. The material will be related, but AMS 7L is a separate course for which you will receive a separate grade. All questions, especially administrative ones, regarding AMS 7L should be answered by the lab instructor, Matt Heiner (mheiner@ucsc.edu).

Recommended reading: We will cover the material in this course quickly. It is recommended (especially if you are struggling) to stay up to date in reading the relevant sections of the text. The tentative schedule is at the end of this document and it will be also available on *Canvas*. The material for each class is listed there.

Homework: Homework will be assigned every lecture, but will not be collected or graded. Answers to the odd numbered problems are in the back of the book. If you feel it would help, you are encouraged to work together on homework. But remember that you have to take the homework quizzes individually, so the point of the homework is to learn the material and practice for the

quizzes and exams.

Grading Policy and Exam Information:

- **Quizzes (30%):** There will be **four (4) quizzes** based on the homework, as indicated on the schedule. They will be held on. Many questions will be selected homework problems with the numbers changed. The quizzes are closed book, but you should bring a calculator. You must show all work (where applicable) for full credit. **Your lowest quiz score will be dropped**, and this is meant to account for nearly all reasons you might have to miss class, including illness. There will be **no make-up for quizzes, no exceptions**.
- **Midterm (30%):** There will be **one in-class midterm exam** on **July 10**. The midterm will cover material from chapters 1-6.
- **Final (40%):** The **final exam** will be in class on **July 26**. The final will be a comprehensive exam, covering all chapters discussed in class. **The date of the final will not be changed**.
- **Additional information about exams:** You will need a calculator for the midterm and final. You cannot use a cell phone, tablet, or computer as a calculator. It is important that the calculator has a square root key and logarithms, in addition to the usual arithmetic operations. All the exams and quizzes are closed-book. I will provided you with a formula sheet.

Letter grade assignments will correspond (approximately) to the following ranges:

Score	Grade
100%+	A+
93% - 99.9%	A
90% - 92.9%	A-
87% - 89.9%	B+
83% - 86.9%	B
80% - 82.9%	B-
77% - 79.9%	C+
73% - 76.9%	C
70% - 72.9%	C-
67% - 69.9%	D+
60% - 66.9%	D
0% - 59.9%	F

Your final grade will be no lower than what is indicated by this table.

Regrading request: If you feel that a regrade request can be justified, write your appeal on a paper, staple it to the front of your exam and give them to the TA or me. Any regrading request should be submitted within one week after it has been returned to the class. No exam will be regraded if there is any additional writing on the exam, in any location.

DRC accommodation: The Disability Resources Center reduces barriers to inclusion and full participation for students with disabilities by providing support to individually determine reasonable academic accommodations. If you have questions or concerns about exam accommodations, or any other disability-related matter, please contact the DRC office, located in Hahn 125 or at

831-459-2089 or drc@ucsc.edu. If you qualify for and seek classroom/exam accommodations, please submit your Accommodation Authorization Letter from the DRC to me as soon as possible, preferably within the first few days of the course.

Academic dishonesty: 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. 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. In the event a student is found in violation of the UCSC Academic Integrity policy, he or she may face both academic sanctions imposed by the instructor of record and disciplinary sanctions imposed either by the provost of his or her college or the Academic Tribunal convened to hear the case. 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.

Title IX: The university cherishes the free and open exchange of ideas and enlargement of knowledge. To maintain this freedom and openness requires objectivity, mutual trust, and confidence; it requires the absence of coercion, intimidation, or exploitation. The principal responsibility for maintaining these conditions must rest upon those members of the university community who exercise most authority and leadership: faculty, managers, and supervisors.

The university has therefore instituted a number of measures designed to protect its community from sex discrimination, sexual harassment, sexual violence, and other related prohibited conduct. Information about the Title IX Office, the online reporting link, applicable campus resources, reporting responsibilities, the UC Policy on Sexual Violence and Sexual Harassment and the UC Santa Cruz Procedures for Reporting and Responding to Reports of Sexual Violence and Sexual Harassment can be found at titleix.ucsc.edu.

The Title IX/Sexual Harassment Office is located at 105 Kerr Hall. In addition to the online reporting option, you can contact the Title IX Office by calling 831-459-2462.

Session deadlines:

- Drop: Monday, July 1
- Change grade option: Friday, July 5
- Withdraw: Friday, July 12

Summer Session does not drop students for non-attendance or non-payment. Students must drop themselves.

Tentative Course Outline:

Coverage subject to change.

Date	Sections	Topics
June 24	1.1 1.2-1.3 2.1-2.4 3.1-3.2	Intro to the course, statistical thinking Data types, collecting data Looking at data Measures of center
June 26	Quiz 1 3.2-3.3 4.1	Measures of Dispersion Definition of Probability
June 28	4.2-4.3	Probability rules, Risks and odds
July 1	5.1-5.3 6.1-6.5	Probability distributions –Binomial and Poisson Normal distribution, sampling distributions, and Central limit theorem
July 3	Quiz 2 6.6	Normal approximation to the binomial
July 5	7.1-7.2	Estimation, confidence intervals for proportions and means
July 8	Review	
July 10	Midterm Exam	9:00 am in class
July 12	8.1 8.2-8.3	Hypothesis Testing Testing means and proportions
July 15	Quiz 3 9.1-9.2 9.3	Two-sample tests Tests for two dependent samples
July 17	10.1-10.2	Correlation and Regression
July 19	Quiz 4 10.3-10.4	More on Regression, Multiple Regression
July 22	11.1-11.2 12.1-12.2	Contingency Tables & Chi-Square Tests Analysis of Variance
July 24	Review	
July 26	Final Exam	9:00 am in class