

Instructor: Matthew Heiner

Email Address: mheiner@ucsc.edu

Office Location: Baskin Engineering (BE) room 358

Office Hours: Wednesday @ 1:30 - 2:30 pm, Friday @ 4 - 5 pm

Course Description: This course provides an introduction to probability and statistics with an emphasis on applications to the natural and social sciences. You will learn to do various calculations, but the principal goal is understanding the concepts and learning to interpret the (numerical) results. Please see the lecture schedule that follows for a more detailed list of topics.

Lectures: Monday, Wednesday, and Friday 2:40 - 3:45 pm, J. Baskin Auditorium 101.

Web page: The official course page <https://courses.soe.ucsc.edu/courses/ams7/Winter18/01> will redirect you to *Canvas* where you can login using your Gold ID and password (<https://canvas.ucsc.edu>). Check *Canvas* frequently for announcements, homework assignments, posted class materials, and grades.

Text: *Biostatistics for the Biological and Health Sciences*, M. M. Triola and M. F. Triola, Pearson 1st Edition (2006).

Discussion Sections: The TAs will work through even-numbered homework problems and answer other questions about the assigned homework. Attendance in discussion section counts toward 10% of the course grade. All the quizzes and exams will be passed back in discussion section.

Discussion	Time	Location
DIS 01A	Wednesday, 9:20 - 10:25 am	BE room 165
DIS 01B	Wednesday, 10:40 - 11:45 am	BE room 165
DIS 01C	Thursday, 8:30 - 9:35 am	BE room 165

Teaching Assistants

Name	Email	Hours	Location
Arthur Lui	alui2@ucsc.edu	Tuesday, 2:00 - 3:00 pm	BE room 312 C/D
Michael Warner	mawarner@ucsc.edu	Monday, 1:30 - 2:30 pm Friday, 1:30 - 2:30 pm	BE room 121 BE room 121

Computer Labs: Enrollment in **AMS 7L** is a co-requisite. Material will be linked, but administratively 7L is a separate course and you will receive a separate grade for 7L. The lab is online. Please see the web page for your lab sections. All questions, especially administrative ones, about AMS 7L should be answered by the lab instructors, Raquel Barata (rbarata@ucsc.edu) and Dan Spencer (daspence@ucsc.edu).

Reading and homework: We will cover the material in this course quickly. It is expected that you will stay up to date in reading the relevant sections of the text before the corresponding

lecture. A tentative schedule with reading material for each class is listed at the end of this document. Homework problems will be posted on the class website. You should use the homework to test your understanding and review after the lecture. Homework will not be collected or graded, but questions on the quizzes will be similar to homework problems.

Grading Policy and Exam Information:

- **Quizzes (20%):** There will be four (4) quizzes as indicated on the schedule. They will be held on **January 22, February 5, March 2, and March 14**. Questions will be similar to homework problems. 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 when computing your quiz average, and this is meant to account for nearly all reasons you might have to miss class, including illness or adding the class (in the case of Quiz 1). There will be no make-up for quizzes.
- **Midterm (30%):** There will be one in-class midterm on **February 23**. The midterm will cover material from chapters 1-7. Be sure to bring a calculator. You must show all work for full credit.
- **Final (40%):** The final exam will be held in the classroom on **March 20** from 4 - 7 pm. Be sure to bring a calculator. The final will be a comprehensive exam, covering all chapters discussed in class.
- **Discussion Attendance (10%):** Attendance will be recorded by TAs in discussion sessions beginning on the third week of class. One absence will be dropped, so you can miss one discussion section and still receive full credit. In extenuating circumstances and with *prior approval* of both TAs involved, a missed discussion can be made up by attending another time during the same week.
- **Additional information about quizzes and exams:** You will need a calculator for all the exams and quizzes. You cannot use a 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. For the midterm and final only (not for the quizzes), you may also bring a single page (8.5 by 11 inches, both sides) of hand-written notes prepared by you. These notes should have your name and will be collected with your exam. You are not allowed to include solutions to specific homework problems on this sheet. You must show all your work (when applicable) in the quizzes and exams to get full credit.

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

Score	Grade
90% - 100%	A- to A+
80% - 89%	B- to B+
65% - 79%	C to C+
60% - 64%	C-
50% - 59%	D
0% - 49%	F

Your final grade will be no lower than what is indicated by this table. I will not bargain or round for cases that are borderline between different grade levels. However, I will offer various extra credit

opportunities throughout the class.

Regrading request: If you feel that a regrade request can be justified, write your justification 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 a week after it has been returned to the class. No quiz or exam will be regraded if there is any additional writing on the exam, in any location.

DRC accommodation: The Disability Resource Center (DRC) 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 https://www.ue.ucsc.edu/academic_misconduct 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, advice, referrals, and/or copies of 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 are available to all students, faculty, and staff by contacting Tracey Tsugawa, Title IX/Sexual Harassment Officer, 105 Kerr Hall, 459-2462, or ttsugawa@ucsc.edu.

Winter 2018 Quarter deadlines:

- Add/Drop: Monday, January 29
- Withdraw: Monday, February 21

Tentative Course Outline:

Coverage subject to change. Please keep up with the reading assignments.

Date	Sections	Topics
January 8	1.1	Intro to the course. Why study statistics?
January 10	1.2	Data types
	1.3	Experiments
January 12	2.1-2.3	Looking at data
	2.2	Frequency distributions
January 17	2.4	Measures of central tendency
	2.5	Measures of dispersion
January 19	2.6	Relative standing (standardizing)
	2.7	Exploratory data analysis
January 22		Quiz 1 (Ch. 1-2)
January 24	3.1-3.3	Introduction to probability
	3.3-3.5	Probability rules
January 26	3.5	Bayes' theorem
January 29	3.6-3.7	Odds, risk, rates
January 31	4.1-4.4	Binomial distribution
	4.5	Poisson distribution
February 2	5.1-5.2	Normal distribution
	5.2-5.3	Normal distribution
February 5		Quiz 2 (Ch. 3-5.3)
February 7	5.4	Sampling distributions
	5.5	Central limit theorem
	5.6	Normal approx. to binomial
February 9	5.7	Assessing normality
	6.1-6.4	Point estimates, confidence intervals
February 12	7.1	Hypothesis Testing
February 14	7.2	Power and sample size
	7.4-7.5	Hypothesis testing for means
February 16	7.3	Hypothesis testing for proportions
February 21		Review
February 23		Midterm Exam (Ch. 1-7)
February 26	8.1, 8.3	Two-sample hypothesis tests
February 28	8.2	Two-sample proportions
	8.4	Matched pair tests
March 2		Quiz 3 (Ch. 6-8)
	9.1-9.2	Bivariate data
March 5	9.1-9.2	Correlation
	9.3-9.4	Regression
March 7	9.3-9.4	Regression model checking
	9.5	Multiple regression
March 9	11.1-11.2	Analysis of variance (ANOVA)
March 12	10.1-10.3	Tests for categorical data
March 14		Quiz 4 (Ch. 9-11)
March 16		Review
March 20		Final Exam at 4:00 pm in class