AMS 7-01 **Statistics for the Biological Environmental, and Health Sciences** **Summer 2017**

Instructor: Matthew Heiner
Email Address: mheiner@ucsc.edu
Office Location: Baskin Engineering room 312 C/D
Office Hours: Monday @ 2 pm - 3 pm, Friday @ 12 pm - 1 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: Tuesday and Thursday, 9:00 am - 12:30 pm, Physical Sciences 136.

Web page: https://courses.soe.ucsc.edu/courses/ams7/Summer17/02. Check the course website frequently for announcements, homework assignments, and posted class materials. Grades can be found on *Canvas* where you can login using your Gold ID and password (https://canvas.ucsc.edu).

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

Discussion Sections: The TA will work through additional examples and answer questions about the assigned homework. Attendance in discussion section counts toward 5% of the course grade. All the quizzes and exams will be passed back in discussion section. If you have a recurring schedule conflict with the discussion section, please email me for an alternate assignment.

Discussion	Time	Location
DIS 01A	Thursday, 1 pm - 2:30 pm	Social Sciences 1 room 149

Teaching Assistant

Name	Email	Hours	Location
Chelsea Lofland	clofland@soe.ucsc.edu	Thursday, 2:30 - 4:30 pm	Baskin Engineering 312 C/D

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. This 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 instructor, Cheng-Han Yu (cheyu@soe.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 (25%):** There will be four (4) quizzes based on the homework, as indicated on the schedule. They will be held on **August 8**, **August 15**, **August 24**, and **August 29**. 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. There will be no make-up for quizzes, no exceptions.
- **Midterm (30%):** There will be one in-class midterm on **August 17**. 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 in class on **August 31**. Be sure to bring a calculator. The date of the final will not be changed. The final will be a comprehensive exam, covering all chapters discussed in class.
- **Discussion Attendance (5%):** As with quizzes, one attendance mark will be dropped, so you can miss one discussion section and still receive full credit.
- **Additional information about quizzes and exams:** You will need a calculator for all the exams and quizzes. 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. Only for the midterm and the final (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 in this piece of paper. 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 students 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.

Session deadlines:

- Drop: Monday, August 7
- Withdraw: Friday, August 18

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

Tentative Course Outline:
Coverage subject to change. Please keep up with the reading assignments.

Date	Sections	Topics
August 1	1.1	Intro to the course. Why study statistics?
	1.2-1.3	Data types, experiments
	2.1-2.3	Looking at data
	2.4	Measures of central tendency
August 3	2.5	Measures of dispersion
	2.6	Relative standing (standardizing)
	2.7	Exploratory data analysis
	3.1-3.2	Probability
August 8		**Quiz 1**
	3.3-3.5	Probability rules, Bayes' theorem
	3.6-3.7	Odds, risk, rates
	4.1-4.5	Discrete distributions – binomial and Poisson
August 10	5.1-5.4	Normal distribution, Sampling distributions
	5.5-5.7	Central limit theorem
August 15		**Quiz 2**
	6.1-6.4	Point estimates, confidence intervals
	7.1-7.2	Hypothesis Testing
		Review
August 17		**Midterm Exam**
	7.4-7.5	Hypothesis testing for means
	7.2	Power and sample size
August 22	7.3	Hypothesis testing for proportions
	8.1-8.4	Two-sample hypothesis tests
August 24		**Quiz 3**
	9.1-9.2	Correlation
	9.3-9.4	Regression
August 29		**Quiz 4**
	9.5	Multiple regression
	11.1-11.2	Analysis of variance (ANOVA)
	10.1-10.3	Tests for categorical data
August 31		Review
		Final Exam at 10:30 am in class