

University of California, Santa Cruz
Department of Applied Mathematics and Statistics
Baskin School of Engineering

AMS-5 Statistics — Fall 2006

General course information

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|----------------|-----------------------------------------------|---------------------------------------|--------------------------------------|----------------------------------------------|
| | Athanasios Kottas (Instructor) | Vaneet Batish (Teaching Assistant) | Saheli Datta (Teaching Assistant) | Juancarlos Laguardia (Teaching Assistant) |
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| Phone | 459-5536 | | | |
| Office hours** | Mon 2-3pm Wed 2-3pm (or by appointment) | Wed 5-6pm Fr 9:30-10:30am | Tue 10-11am Thu 2:30-3:30pm | Mon 11am-12pm Wed 11am-12pm |

* BE – Baskin Engineering

** The TA office hours will be held in Jack’s Lounge (in the Baskin Engineering building).

Web page: <http://www.soe.ucsc.edu/classes/ams005/Fall06/>

Lectures: Tuesday, Thursday 12:00-1:45pm (Thimann Lecture 3)

Discussion sections:

Section 01A: Monday 9:30-10:40am, Engineering 2 192 (Saheli)

Section 01B: Tuesday 8:30-9:40am, Earth & Marine Sciences B210 (Vaneet)

Section 01C: Wednesday 6:30-7:40pm, Eight Acad 252 (Vaneet)

Section 01D: Thursday 6:00-7:10pm, Physical Sciences 110 (Juancarlos)

Section 01E: Friday 8:00-9:10am, Engineering 2 192 (Juancarlos)

Course description (from the registrar): Introduction to statistical methods/reasoning, including descriptive methods, data-gathering (experimental design and sample surveys), probability, interval estimation, significance tests, one- and two-sample problems, categorical data analysis, correlation and regression. Emphasis on applications to the natural and social sciences. Students cannot receive credit for this course and course 7, and Mathematics 5 and 7. (Formerly ENGR 5.)

Course objectives: To provide an introduction to the basic ideas of probability and statistics with applications to the natural and social sciences (as well as everyday life). Emphasis will be placed on concepts, methods and interpretation of results. In the process, we will learn how to perform some calculations useful for statistical data analysis.

Background: There are no formal prerequisites, but you should be comfortable with high school math at roughly the level of college algebra. In particular, this is **not** a calculus-based course.

Textbook: *Statistics*, Third Edition, by David Freedman, Robert Pisani and Roger Purves (1997), New York: Norton.

Reading: The material in this course is cumulative and may go quickly. It is expected that you will stay up to date by reading the relevant textbook chapters and practicing with the homework problems. Note that, although attendance of the discussion sections is optional, it is **strongly** encouraged. The TAs will

discuss solutions to homework problems, work through additional examples, and answer questions.

Homework: Homework will be assigned (typically, on a weekly basis), but will not be collected or graded. Answers to all the textbook exercises (other than the review exercises) are given at the back of the book. Working on the homework problems will enable you to develop facility in statistical thinking through regular practice. Moreover, it will provide early and regular feedback on your performance in the course through the solutions provided in the book and also discussed during the sections, lectures, and office hours.

Quizzes: There will be four in-class short quizzes. Tentative dates for the quizzes are:

- Quiz 1: Thursday October 5
- Quiz 2: Tuesday October 17
- Quiz 3: Tuesday November 7
- Quiz 4: Thursday November 16

(If the date for a quiz is changed, it will be announced at least a week in advance of the new date.) In general, the problems for the quizzes will be based on the homework exercises. The lowest quiz score will be dropped when computing your average quiz score. This is meant to account for any reason that might prevent you from taking a particular quiz. In addition, there will be an

Optional make-up quiz on Thursday November 30

If you take this quiz, you may use its score to replace a lower score of an earlier quiz. Make-up quizzes will **not** be assigned.

Exams: There will be a midterm and the final exam. The final exam date and time (designated by the registrar) and the (tentative) date for the midterm are:

- Midterm exam: Thursday October 26
- Final exam: Tuesday December 5, 4-7pm

Both the midterm and the final exam will be in-class. The final exam will be cumulative.

Both of the exams as well as the quizzes will be closed-book, but you may bring one (letter size) piece of paper with notes and formulas on both sides. You should also bring a calculator capable of computing square roots, logarithms and exponentials.

Re-grade requests: We will consider re-grade requests for the midterm exam and the quizzes. In all cases, the request will be considered only within a week after returning the exam/quiz papers (except, of course, for outright grading mistakes, wrong addition of points etc.). You must provide your written request along with the exam/quiz paper.

Course grade: Quizzes: 30%, Midterm exam: 30%, Final exam: 40%

Tentative syllabus: We will cover the following topics:

- *Design of experiments* (chapters 1,2)
- *Descriptive statistics* (chapters 3,4,5)
- *Probability* (chapters 13,14,15)
- *Chance variability (expected values, standard errors)* (chapters 16,17,18)
- *Sampling* (chapters 19,20,21,23)

If time permits, we will also discuss some of the ideas on:

- *Correlation and regression* (chapters 8,9,10,11)