

Statistical Models and Methods - Math 410 (CRN 17044), Fall 2011
Deady 102 MTF 12-12:500

Professor: Hal Sadofsky, Office: Fenton Hall 215, x6-4705.
Hours: MW: 2-3 and by appointment.
E-mail: sadofsky@uoregon.edu.
WWW: <http://pages.uoregon.edu/sadofsky/410>

Text: *Statistics for the Sciences*, Buntinas & Funk. We will cover chapters 1-15 (skipping chapters 9 and 10), and if time allows, chapter 16.

Exams: There will be a midterm in class on Friday, October 28, and a final exam Friday December 9th at 10:15.

Problem Sets: There will be weekly homework assignments. Some will involve the use of statistical software of some kind.

Grades: The midterm exam will be 25% of your grade, the total homework will count as 25% of your grade, and the final exam will count for 50%.

Statistics courses in the math department: The mathematics department has two other (sequences) of courses that deal with statistics.

- (1) Math 461-463 is a year long course in probability and statistics that is suitable for people who want to do further work in either area, or have career objectives involving statistics.
- (2) Math 425-426 is an applied statistics course aimed at students in the sciences who do not necessarily have a calculus background.
- (3) Math 410 (this course) is aimed at students with a good calculus background who want a one term course covering both some of the theory behind mathematical statistics, and some of the standard applications to estimation and hypothesis testing.

Course Objectives: Students will learn the basic definitions of probability theory, including the definitions of *discrete* and *continuous* random variables and various definitions of spread and the proof of Chebyshev's inequality.

Students will also learn the definition of normal random variables, and various normal approximations to other random variables (including the binomial random variable) and the statement of the central limit theorem.

Students will be able to calculate parameters for samples from a population with known parameters, and will learn standard techniques to estimate

The University of Oregon is working to create inclusive learning environments. Please notify me as soon as possible if there are aspects of the instruction or design of this course that result in disability related barriers to your participation. You may also wish to contact Disability Services in 164 Oregon Hall at 346-1155 or disabsrv@uoregon.edu

population parameters from statistics based on samples. In particular, students will be able to apply t -tests and z -tests as appropriate (for one and two samples) to do hypothesis testing and confidence intervals. Students will also use the χ^2 statistic to do hypothesis testing with categorical data.

Students will calculate and apply correlation coefficients and regression lines, and use regression for estimation.

Emphasis will be placed on starting with data describing non-mathematical objects and situations and on explaining answers to questions in both mathematical and non-mathematical terms.

This is an introductory course, and every topic we cover could be covered in much more depth.

Other Points:

- Email is generally a very effective way to reach me, and I encourage students to email me when you have questions or need to reach me for other reasons.
- We will not cover all the textbook, but students should read sections that we skip (although there is no need to read Chapters 9 and 10). Much of chapter 2 is covered in high school, and I will cover very little of it in class, but will use that material as needed. You'll get considerably more out of class if you come to class having already read the relevant section of the textbook. To optimize this, mark questions in your text as you are reading, and if you don't resolve those questions on your own, ask about them in class.
- Even though homework is only 25% of the grade, it is the most important part of the class. That is, you learn more from the approximately 9 hours per week you'll spend doing homework than from the 3 hours per week you spend with me in lecture, so the homework should be taken very seriously.
- Please ask questions in class. I'm always happy to spend the first few minutes of class dealing with questions from homework, the textbook, or previous lectures.

APPROXIMATE SCHEDULE

9/26-9/30:	Chapters 1, 2, 3.1-3.3	10/31-11/4:	Chapter 12, 13
10/3-10/7:	Chapter 3.3-3.6, 4	11/7-11/11:	Chapter 13, 14
10/10-10/14:	Chapter 5.1, 5.2, 6	11/14-11/18:	Chapter 15
10/17-10/21:	Chapter 7, 8	11/21-11/25:	Chapter 16, Thksgvng
10/24-10/28:	Chapter 11, MIDTERM	11/28-12/2:	REVIEW