

Statistics 13 (Section 21)–Summer 1999
Division of Statistics, UC Davis

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Office Hours: TBA

Room & Time: MTuWTh 10:00-11:40am at 223 Olson

Teaching Assistant: TBA

Course Description: Descriptive statistics. Introduction to some basic probability concepts. Probability distributions: Binomial, Hypergeometric, Uniform, Normal, Student's t, Chi-square, and F-distributions. Basic inferential statistics: confidence intervals, hypothesis testing, regression and correlation analysis.

Prerequisites: Two years of high school algebra or the equivalent in college.

Reference Text: Bluman, Allan, (1998). *Elementary Statistics: A Step by Step Approach*, 3rd ed. McGraw-Hill, Boston.

Grading Policy: The final course grade is based on

1. a midterm (30%)
2. a final (50%)
3. quizzes usually (at the beginning of class) (10%) and
4. a small (5x8) binded note cards containing all the relevant formulas and examples for computation (10%).

The midterm and final exam consist of two parts, a conceptual part and a computational part. For the computational part of the exam you may use the note cards/book that you made. There will be *no* make-up for missed quizzes. There will be *no* make-up for missed exams, except for valid circumstances. Solutions to homeworks, the midterm, and some handouts will be made available for purchase at Classical Notes (on campus in the Student Union).

Course Outline: This introduction to statistics course is organized into three parts:

1. Descriptive Statistics
2. Distribution Theory and
3. Statistical Inference.

We will generally adhere to the following course outline. There may be some (minor) departure from the course outline.

Week 1 *Mon 8/9 - Thu 8/12*

Introduction I: An overview of statistics. Preliminaries: Variables, constant variables. Data. Summation notation. Distances. Equation of a line.

Graphical summaries of data. Numerical summaries of data. The "closest" (best) constant approximation problem. Standard deviation as distance.

Linear combinations of variables. Scatter plots. Simple linear regression: the "best" simple linear combination problem.

Week 2 *Mon 8/16 - Thu 8/19*

Proportionate reduction in error (PRE). Correlation coefficient. Simple linear regression continued. The multiple linear regression problem.

Introduction II: The need for studying probability. Basic probability concepts: Sets. Intersection, union, complementation. Simple events. The sample space. Probability. Independent Events.

Law of total probability. Conditional probability. Bayes rule. Computing probabilities: counting techniques.

Introduction to distributions. Distributions as models. Discrete distributions: Binomial and Hypergeometric distribution family of distributions. "Height" as probabilities.

Week 3 *Mon 8/23 - Thu 8/26*

Continuous distributions: Uniform, Normal, Student's *t*, Chi-square, and F-distributions family of distributions. "Area" as probabilities. Standardization. Chebychev Inequality.

Introduction III: The "bridge" between probability and statistics. Sampling. Introduction to sampling distributions. The Central Limit Theorem (CLT). Normal approximation of discrete probabilities.

Mitern review. **Thu 8/26 Midterm Exam.**

Week 4 *Mon 8/30 - Thu 9/2*

Introduction IV: Statistical Inference. Point estimation and confidence interval (CI) estimation. CI for the mean of a normal population, with variance known and unknown. CI for the variance.

Two independent normal populations. CI for variance. CI for difference of two means with variances known; with variance unknown but equal.

One Binomial population. Approximate CI for population proportion. Two independent binomial populations and CI for the difference of two population proportions. CI for the intercept and slope in SLR.

Week 5: *Tue 9/7 - Thu 9/10* **Mon 9/6 Holiday.**

Introduction to test of hypotheses. Tests for population mean(s) and proportion(s). Test in SLR. Test for correlation.

Week 6 *Mon 9/13 - Thu 9/16*

Test of hypotheses continue.

Final review. **Thu 9/16 Final Exam.**

