

## Tentative Course Outline, Syllabus, and Reading List

Here is a rough outline for the course. We will probably postpone some of the topics below (mainly the ones marked (\*)) to your next statistics course (if any).

- I. Introduction/Overview
- II. Descriptive Methods
  - A. Graphical
  - B. Numerical
  - C. The Normal Curve
- III. Gathering Data
  - A. Experimental Design
  - B. Sample Surveys
- IV. Probability
  - A. Frequentist
  - B. Bayesian (\*)
  - C. Expected Value, Standard Error, and the Central Limit Theorem
  - D. Working With Averages
- V. The Ideas Behind Inference and Prediction
  - A. Building a Statistical Model
  - B. Point and Interval Estimates
  - C. What to Do When the Standard Models Don't Fit (\*)
  - D. Significance Testing
  - E. An Introduction to Prediction (\*)
- VI. Inferential and Predictive Applications: Continuous Outcomes
  - A. The Two-Sample Problem
  - B. Sample-Size Calculations (\*)
- VII. Inferential and Predictive Applications: Discrete Outcomes
  - A. Inference on Proportions
  - B. The Binomial Distribution (\*)
- VIII. Correlation and Regression
  - A. Correlation
  - B. Simple Linear Regression
- IX. More Applications
  - A. An Introduction to Qualitative Data Analysis (\*)
  - B. The Analysis of Variance (\*)
- X. An Introduction to Decision Analysis (\*)

The schedule below may be too ambitious; I wouldn't be surprised if it slipped a bit. Optional readings in FPP are in parenthesis.

		readings	
date	topic	DD	FPP
Tu Mar 29	introduction, histograms	ch. 1	preface
Th 31	histograms, stemplots, distributions	ch. 2	ch. 3
Tu Apr 5	measures of center and spread	ch. 3	ch. 4
Th 7	the normal curve, experimental design	ch. 4, 5	ch. 5, 1
Tu 12	experimental design, sampling	ch. 6	ch. 2, 19 (22)
Th 14	probability	ch. 7	ch. 13
Tu 19	probability	ch. 8	ch. 14 (15)
Th 21	building a probability model; expected value and standard error	ch. 9, 10	ch. 16, 17 (25)
Tu 26	the Central Limit Theorem (take-home midterm handed out)		ch. 18
Th 28	building a statistical model	ch. 11	ch. 6
Tu May 3	estimating averages (take-home midterm due)		ch. 23, 24
Th 5	estimating averages and percentages		ch. 20, 21
Tu 10	significance testing		ch. 26
Th 12	testing (continued)		ch. 29

## readings

date	topic	DD	FPP
Tu 17	comparing two samples: continuous outcomes		ch. 27
Th 19	comparing two samples: dichotomous outcomes		
Tu 24	correlation		ch. 8, 9 (7)
Th 26	correlation, regression		ch. 10
Tu 31	regression		ch. 11
Th Jun 2	regression prediction		ch. 12
sometime between Jun 3 and 5	review session		
M Jun 6	final exam (8.00-11.00am, place to be arranged)		

If you want you can also do some optional reading from FPP on categorical data analysis (ch. 28).