BOSTON COLLEGE
Department of Economics

Ec 157.01   Harold Petersen
Statistics-Honors   McGuinn 518,   (617) 552-4550
Fall, 1999   Office Hours: M 2-3, W 3-4, Th 2-3:30

Syllabus

Text: Smith, Gary. Introduction to Statistical Reasoning, 1998.

Supplemental Book (on reserve in O'Neill Library): Smith, Gary. Statistical Reasoning,
        3rd edition, 1991. (referred to on the following pages as Smith 91.

Course Requirements: 2 midterm exams (30% each), on **Sept. 30** and **Nov. 4**
                         a final exam (40%), on **Dec. 18 at 9:00 a.m.**
                         numerous problem sets (used as additional evidence for up to one
                              notch on your final grade: B+ to A-, B to B+, etc.)

Course Organization and Expectations:

        Ec. 157 is an intensive course in probability and statistics. It assumes some
knowledge of set operations, algebra, and calculus, and most importantly, intellectual
curiosity and a willingness to work. I expect you to come to every class, to read the text
carefully, to work through the problem sets, and to raise questions in class.   You are
encouraged to work together on the problem sets, if you like, but you should all be sure to
understand how they are done.

        Your work on exams is to be entirely your own. Be sure you are familiar with the
sections on "Academic Honesty" in the Undergraduate Catalog (p. 35) and be aware that I take
this most seriously.

        There will be no make-up exams. If you miss an exam for good reason, let me know
immediately (my phone has voice mail) and you will be graded on the other exam and the
final. If you do poorly on one mid-term but consistently well on the other one and the final,
the one poor exam will be discounted (but not completely ignored).

        Finally, a word on statistics.   It should be fun, no matter what you have heard about
it. It should give you a sense of power and hopefully of responsibility too as you gain that
power. It will be new to most of you, and some of you will find it difficult. But you have a
good text (read it and supplement it with Smith 91 as found on reserve) and you will have
problem sets designed to help you master the more difficult material.   If you take the course
seriously and you work at it, most particularly early on, you will do well and you will enjoy
it.

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<u>Date</u>	<u>Topics</u>	<u>Assignment</u>
Sept. 2	Introduction Data, Description, & Inference Frequency Distributions & Histograms	Text, Chs. 1 and 2
Sept. 7	Central Tendency: Mean, Median, Mode Dispersion (or spread): Range, Variance, Standard Deviation	Text, Ch. 3 (3.1-3.3)
Sept. 9	Probability The Sample Space Probability: Basic Axioms Classical, Relative Frequency, and Subjective Interpretations	Text, Ch. 5 (5.1) Smith 91 (2.2-2.5)
Sept. 14	Simple Events and Compound Events The Addition Rule Conditional Probability and Independence The Multiplication Rule	Text, Ch. 4 (5.2) Smith 91 (3.2-3.4)
Sept. 16	The Subtraction Rule Bayes Theorem	Smith 91 (3.5,pp.113-115) Smith 91 (3.6)
Sept. 21	Random Variables Probability Distributions Expected Values and Moments Mean, Variance, Standard Deviation, Skewness	Text, Ch. 5 (5.1-5.3) Smith 91 (4.1-4.2)
Sept. 23	Discrete Distributions The Binomial Distribution The Poisson Distribution The Law of Large Numbers	Text, Ch. 5 (5.3-5.4) Smith 91 (5.8)
Sept. 28	Functions of Random Variables Linear Transformations	Smith 91 (4.8)
Sept. 30	**First Midterm Examination**	
Oct. 5	Continuous Distributions The Uniform Distribution The Normal Distribution The Central Limit Theorem	Text, Ch. 5 (5.5-5.6) Smith 91 (6.3,pp.242-243)
Oct. 7	Using the Normal Distribution Standardized Distributions Approximating Binomial Probabilities	Text, Ch. 5 (5.7)

Oct. 12	Sampling Samples and Populations Random Sampling Sampling Distributions	Text, Ch. 4 Text, Ch. 6 (6.1,pp.274-281)
Oct. 14	Estimation of Parameters Properties of Estimators Confidence Interval Estimates	Text, Ch. 6 (6.1)
Oct. 19	Small Sample Estimates The "t" Distribution	Text, Ch. 6 (6.2)
Oct. 21	Confidence Intervals for the Proportion	Text, Ch. 6 (6.3)
Oct. 26	Tests of Hypotheses The Null Hypothesis The Prob Value	Text, Ch. 7 (7.1-7.3)
Oct. 28	Type I and Type II Errors The Power of the Test	Smith 91 (10.3,11.1)
Nov. 2	Tests of Hypotheses (cont'd) Small Sample Tests	
Nov. 4	**Second Midterm Examination**	
Nov. 9	Regression Fitting a Line to the Data Ordinary Least Squares	Text, Ch. 11 (11.2)
Nov. 11	The Regression Model Error Term Assumptions Estimating the Parameters	Text, Ch. 11 (11.1)
Nov. 16	Standard Errors The "t" statistics R-Squared and Adjusted R-Squared	Text, Ch. 11 (11.3-11.4)
Nov. 18	Predicting Y at a given level of X Prediction Intervals	
Nov. 23	Multiple Regression The General Linear Model Dummy Variables Confidence Intervals t Statistics	Smith 91 (15.1-15.3)
Nov. 30	Regression and Forecasting Some Regression Pitfalls	Text, Ch. 11 (11.5)
Dec. 2	Regression and Correlation	
Dec. 9	Summary and Review	
Dec. 18	**Final Exam at 9:00 a.m.**	