Statistics for Economists (Honors)
Economics 103
Spring 2007

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Office Hours: Wednesdays, 11:00-12:30.

Class Webpage: Blackboard Courseware (http://courseweb.library.upenn.edu)

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This course is a semester long introduction to probability theory and statistical inference. It focuses on providing students with the tools for measurement of uncertainty in many different contexts with a particular emphasis on economic phenomena. The material covers elementary probability theory, sampling, estimation, hypothesis testing, correlation and regression. Special attention will be given to practical issues in interpreting and handling economic and social data. Empirical case studies that apply the techniques to real-life are brought up and discussed throughout the course.

This is a course in Economic Statistics, with calculus as a prerequisite. A two-semester sequence of mathematical statistics (either Stat 101 and 102 or 430 and 431) can be taken instead to satisfy the statistics requirement of the major (see below). Econ 103 cannot be taken by any student who has already completed statistics at least at the level of Stat 101. Students who have one semester of statistics must take the second course in statistics or Econ 220 to satisfy the statistics requirement. Students are strongly advised to take the second course in statistics, rather than Economics 220. (Students with a one semester AP Statistics credit for Stat 101 or higher can drop the credit in order to take Econ 103 via a release form available from the department.)

Note: Students who took STAT 111/112 prior to, or in the Spring 2006 semester, can count that sequence as waiving out of the ECON 103 requirement. After Spring 2006, however, STAT 111/112 will not be counted to satisfy any of the Economics Department statistics requirements. Students who completed STAT 111 or the 111/112 sequence should enroll in ECON 103.

Homework: I expect to assign around 10 homeworks during the semester.

Exams: There will be two in-class midterm exams and one final exam. Exams are cumulative, with emphasis on recent material. Documented illness or death in the family is a valid excuse for missing an exam.

Required Textbooks:

1. DeGroot, M. and M. Schervish, *Probability and Statistics* (ISBN 0201524880)
2. Newbold, Carlson and Throne, *Statistics for Business and Economics* (ISBN 0536236712)

Grades:

- FINAL GRADE = 20% $\times$ PROBLEM SETS + 25% $\times$ MIDTERM 1 + 25% $\times$ MIDTERM 2 + 30% $\times$ FINAL.
- No late problem sets. Points forfeited.

Software: I intend to assign a few empirical exercises. I recommend that you use Stata or R, but you are free to use any other software.

Calendar:
January 15: Martin Luther King.
February 9: First Midterm Exam.
March 5-9: Spring Break.
March 16: Second Midterm Exam.
April 30: Final Exam.

Course Plan (check course website for updates):

Preliminaries: Describing Data (NCT Ch.2 and 3)

Part I: Introduction to Probability Theory

1. Probability models, conditional probability, independence, Bayes rule (DS Ch.1 and 2; NCT Ch.4)
2. Random variables (DS Ch.3, 4 and 5; NCT Ch.5 and 6)

Part II: Introduction to Statistics

1. Sampling and sampling distributions (DS Ch.7; NCT Ch.7)
2. Point and interval estimation (DS Ch.6; NCT Ch.8)
3. Hypothesis testing (DS Ch.8; NCT Ch.9)
4. Linear regression (DS Ch.10; NCT Ch.10)