

SYLLABUS
Econometrics 671
Spring 2009

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1. Course Description

This is the second-semester course of the first-year Ph.D. econometrics sequence. This course is primarily related to the specification of and estimation, prediction, testing and inference in the linear regression model under ideal and generalized conditions. Other topics covered include: a discussion of typical mean-independence violations and instrumental variables estimation, maximum likelihood theory and application, and some limited dependent variable modeling (including binary choice, ordered probit models, and the tobit model).

Throughout the course, we will apply techniques discussed in the classroom using MATLAB, which is available at the computer labs. I will teach you how to write your own m-files and help you to do the problems on the problem sets using MATLAB. The programming side of the course should not be excessively demanding.

2. Grading and Textbooks

The grade from my portion of the class will be divided (35-65) among problem sets and three examination scores, respectively. Since the problem sets count for 35 percent of your final grade, they will be graded rigorously.

The required textbook is *Econometric Analysis* by Greene. Though we will follow this book, you are only responsible for the topics covered in the lectures. Generally speaking, the book should serve to supplement your understanding of the lectures rather than substitute for it.

3. Course Outline

The following is a very rough outline of the topics covered in this course. I have broken them down into topics I expect we will cover, although we may move faster or slower than expected.

(3 Weeks). Linear Regression model basics under ideal conditions. Specification, estimation, prediction and hypothesis testing. Finite sample properties and asymptotic properties of the OLS estimator. Bootstrapping introduction.

(1 Week). Heteroscedasticity, consequences for OLS and Generalized Least Squares estimation.

(2 Weeks): Mean-Independence violations: Omitted Variables, Measurement Error in X, Simultaneity and Endogeneity. Instrumental Variables Estimation. Identification. Weak Instruments, Overidentification Testing. Examples of IV in practice. *Greene 12.1-12.5, 12.9, 13.1-13.3*

(3 Weeks): MLE Theory: Consistency, Asymptotic Normality, Invariance, Zero Expected Score, Information Equality, Cramer-Rao Lower Bound. Uniform convergence in probability. The Wald, Score and Likelihood ratio tests.

(2 Weeks:) Some Discrete Choice Models: The Probit, Logit, Ordered Probit and Tobit Models
Greene, 23.1-23.4.3, 23.10, 24.1-24.3

(1 Week:) A quick introduction to treatment effects and treatment effect heterogeneity.