

SYLLABUS  
Econometrics 674  
Fall 2011

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## 1. Course Description

This is an upper division Ph.D.-level elective course in microeconometrics. This course is primarily related to the specification and estimation of various models commonly encountered in microeconomic applications. Although some of the introductory material may serve as a review for some of you, we will first cover the theory of maximum likelihood estimation (MLE), and apply MLE in some introductory settings. These methods will then be applied to various latent-variable economic models including binary choice models (the logit, probit and other alternatives) and censored regression models (e.g., the tobit). Building off of our MLE framework, we will also discuss the EM algorithm. Other popular microeconomic models, including ordinal and multinomial choice models, will be covered in a separate course.

Throughout this module, particularly during the second half of 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 get started on some of the MATLAB-based problem sets. The programming side of the course should not be excessively demanding.

## 2. Grading and Textbooks

Your course grade will be divided (60-40) among problem sets and one final examination score, respectively. Since the problem sets count for 60 percent of your final grade, they will be graded rigorously. Our examination will be held on the last regular class session of the module (i.e., Thursday of the 8th week).

The recommended textbook is *Econometric Analysis* by Greene. This is a good reference for all graduate students to have. The book is not required for the course, and indeed, the lecture notes should be reasonably self-contained.

## 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 anticipated.

(4 Weeks). Review of the theory of maximum likelihood. The expected log likelihood inequality, consistency, asymptotic normality, the zero expected score property, the Information Equality and the Cramer-Rao lower bound. Wald, Score and Likelihood ratio tests. Various Applications with introductory sampling models.

(3 Weeks). Estimation and inference in a few popular microeconomic models: The probit, logit and tobit models.

(1 Week) The EM algorithm.