ECON 222: Advanced Econometric Techniques and Applications
Fall 2012
Professor Petra Todd

Course Description

Lecture: 10:30-11:50 Tuesdays and Thursdays
Office Hours: 10-12 Fridays or by appt

Prerequisites: ECON 1, 2, 101, 102, 103, ECON 104
Math 104 and Math 114 (Calculus)
Additional coursework in linear algebra and
statistics are also helpful for this course.

This course introduces undergraduate students to advanced topics in econometrics, with
an emphasis on modeling and estimation methods used in microeconomic applications.
The course will begin with some review of material from the first econometrics course
(ECON 104) using matrix algebra notation, including the OLS model with and without
heteroskedasticity, errors in variables, and instrumental variables. We will then cover
methods for handling discrete variables and limited dependent variables, including
maximum likelihood estimators and flexible semiparametric and nonparametric
estimation methods. Along with the methods, we will consider many policy relevant
applications, including modeling behaviors such as the decision to go to college, to get
married, or to work, marketing applications where we predict the demand for goods
based on their characteristics, and applications in evaluating the effects of treatments and
social programs.

As part of the course, students will also be required to learn how to write programs in the
language R.   This language is widely used to analyze data (both in academic and
nonacademic settings) and several datasets will be used in the problem sets.   R can be
obtained for free from the web site

http://www.r-project.org/

A tutorial for learning R is available on my website http://athena.sas.upenn.edu/~petra.
Students will be required to write R programs for the purpose of implementing the
econometric methods discussed in class and analyzing some datasets. This course
satisfies the university's quantitative data analysis requirement.

Readings

The main text for the course are the course notes that will be made available through
Blackboard. If you want to buy a reference book in econometrics that is helpful for the

course, I recommend the textbook *Econometric Analysis* by William Greene, available at the bookstore. However, we will not closely follow that text and the purchase of the text is not mandatory. Exams will be based mostly material covered in class, so regular class attendance is critical for success in this course.

Grading

4 problem sets:	28%
two midterms:	40% (tentative dates are Oct. 11 and Nov 15)
final exam:	32%

Problem sets will be worth 100 points each. Group work is permitted (and encouraged) on problem sets, although each student needs to hand in a separate assignment. There will be a 10 point penalty for problem sets that are turned in up to a week late. If a final grade is borderline, class attendance and participation will be taken into account.