Overview: This course has two goals: (1) To introduce students to advanced methods associated with linear and non-linear regression analysis, and (2) to develop a practical understanding of how econometric analysis can be used to evaluate policy and examine the empirical relevance of economic theory. The practical application of these methods will be illustrated through topics drawn from the fields of expertise of the instructor and topics of interest to the students.

The course will be devoted to a systematic investigation of applications of econometrics to a variety of problems. The applications are not contained in a particular text but are selected by me from a variety of sources. The usual approach will be to discuss 1) economic issues that motivate the application, 2) econometric techniques and issues related to the application (e.g. data, specification, estimation techniques), and 3) the results of the empirical analysis and what we can learn from them. I strongly encourage participation by students in classroom discussions, and such participation will be rewarded.

Pre-Requisites: A- or better in Economics 20, 21, and 22.

Textbook/Readings:

Introductory Econometrics: A Modern Approach (4th Edition) by Jeffrey Wooldridge (SouthWestern Publishing, or 5th edition is at the bookstore). This is a very comprehensive and well written intro text that we use in ec20. It covers much (but not all) of the more advanced material that we’ll be working on. If you have an earlier (or later) edition, it is pretty similar.

A Guide to Econometrics, 6th Edition by Peter Kennedy (MIT Press, available on the web at places like barnesandnoble.com for about $35). This is a supplemental econometrics text that leaves out the details, but gives an excellent overview of econometrics from simple regression to very advanced techniques. I have used this book since I was an undergraduate (earlier editions of course!) and still find it very useful. If you have an earlier edition, it is pretty similar.

The Journal of Economic Perspectives, Fall 2001 issue (available on blackboard). This issue contains a very useful symposium on econometric tools. Each chapter provides a non-technical overview of an econometric topic. Use these chapters as background reading on each topic.

There will be various handouts, articles and book chapters (some listed below) that are available on Blackboard or from me. You may want to purchase A Gentle Introduction to Stata (3rd Edition) by Alan Acock from www.stata.com. This book provides a fairly comprehensive introduction to Stata (brief Stata handouts are on Blackboard). Full Stata documentation is available through online help & online manuals (hard copies of manuals are in econ lounge) & some FAQ’s are at http://www.dartmouth.edu/comp/soft-comp/software/statistics/statafaq.html
**Requirements:** The central focus of the course will be on student empirical projects. The exact topic and structure of this project is quite flexible. These projects can be done individually or in small groups (2 or maybe 3), and possibly in combination with a paper from a 40-level course or a student’s thesis (with approval from both instructors). The empirical project is worth 50% of the grade. Each student will choose a topic they are enthusiastic about, review the literature, assess data availability, develop an interesting empirical question, analyze the data, and present their results in oral and written form.

In addition to the paper, we will do 3 applied problem sets. These problem sets will all have the form of “mini-projects”, e.g. I will provide some data and broad questions, and you will do the necessary data analysis and write up your results in a short (3-5 page) paper. I strongly encourage everyone to work in small groups (2-3) on these problem sets. The problem sets are worth 30% of the grade, and I base your grade on the best 2 (out of 3) problem sets. The remaining 20% of your grade is based on class participation.

There are no exams in this course.

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**Important Dates:**

- **Regular Class Meetings:** Tuesday & Thursday, 10-11:50.
- **Meet in X-hour:** dates TBD, Wednesdays 3-3:50.
- **Tuesday, Sept. 24**: Submit and discuss in class possible research topic(s).
- **Tuesday, Oct. 22**: Research proposals due, presentations in class & evening (6-10?)
- **Tuesday, Nov. 19**: Present final research results in class & evening (6-10?)
- **Wednesday, Nov. 27**: Final paper due.
PART I: THE BASICS

Topic 1: Getting Started – Research & Writing, Matrix Notation


Wooldridge, Ch. 19 and Appendix D & E (background, we’ll cover key concepts in class)

Kennedy, Ch. 22 and 1-4 (only read notes and technical notes if interested)

(background for choosing paper topic – focus on sections 1, 2.1, and 3, and skim 2.2)


Topic 2: Model Specification, Teacher Value Added, & Stata

Background
Specification testing & outliers: Wooldridge, Ch. 9.1, 9.5; Kennedy, Ch.5, 15, 21.1-21.2.

Applications
Kane, Rockoff & Staiger, “What does certification tell us about teacher effectiveness?

Problem Set 1: Teacher value added
PART II: CAUSAL EFFECTS

Overview
(focus on section 2)

Topic 3: Control Groups, Matching, Difs-in-difs, Panel Data

Background
Wooldridge, Ch. 13-14.

Kennedy, Ch. 18.

Applications
Dale & Krueger, “Estimating the Payoff to Attending a More Selective College: An
Application of Selection on Observables and Unobservables,” Quarterly Journal of

Ruhm, “Are Recessions Good for Your Health?” Quarterly Journal of Economics,

Shen, “The effect of hospital ownership choice on patient outcomes after treatment for acute

Topic 4: Regression Discontinuity Designs

Background

Applications
Peterson, “A Massachusetts Meritocracy: The Adams Scholarship and its Effect on College

Joyce, Kaestner & Colman, “Changes in Abortions and Births and the Texas Parental

Problem Set 2: Parental notification and the fertility discontinuity
Topic 5: Instrumental Variables (IV)

Background
Wooldridge, Ch. 15-16
Kennedy, Ch. 9, 11
Notes on IV, IV paper in fall 2001 JEP.

Applications


PART III: NONLINEAR MODELS

Topic 6: Non-Linear regression/index models (Logit/Probit-type models, hazard, count data models, quantile).

Background
Wooldridge, Ch. 17
Kennedy, Ch. 16-17, 21.3
Logit/Probit & Quantile papers in fall 2001 JEP.

Applications


Problem set 3: Teacher impact on test scores