POL-GA 1250
Quantitative Political Analysis I
Fall 2011

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Overview

The aim of this course is to introduce you to the basic concepts and tools that you will need to (a) start conducting your own quantitative research, (b) understand and critically evaluate other people's quantitative work, and (c) continue to acquire more advanced tools in courses taught in this department and beyond.

Requirements

You are required to attend the two weekly lectures for this course, on Tuesdays and Thursdays, 9am-11am, Room 217. You will also be required to attend a weekly lab session, where you will work with the statistical software package Stata. Lab sessions will be led by the Teaching Assistant for the course, Marko Klasnja.

Problem sets will be assigned during most weeks. I will usually assign them on Thursdays, and they will be due the following Tuesday. The first problem set will be distributed on September 29th and will be due on October 4th. Problem sets must be turned in on time. Late problem sets will not receive any credit.

Please feel free to work on problem sets together with other students. However, you must write up each problem set and perform any analysis submitted as part of the problem set on your own. You can handwrite your answers until the midterm exam. After the midterm, your assignments must be typed. You're strongly encouraged to use LaTeX, but Microsoft Word in combination with the Equation Editor is also acceptable.

The problem sets will be graded on a three-point scale and will count for 40% of your final grade. The midterm exam will count for 25% and the final exam for the remaining 35% of your grade in the class.

Readings

There are two required textbooks for this course:

- Dennis D. Wackerly, William Mendenhall III, and Richard L. Scheaffer, *Mathematical Statistics with Applications*, 7th edition, Brooks/Cole.

- Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, 4th edition, South-Western.

These books are available at the NYU Bookstore at 726 Broadway, and I've also requested that they'll be available at the Bobst reserves desk.

Sometimes students benefit from seeing material presented in different ways by different authors, and I can recommend additional texts if you are interested. Two other popular treatments include:

- G. S. Maddala, and Kajal Lahiri, *Introduction to Econometrics*, 4th edition, Wiley, which is similar in scope to Wooldridge, but some students find more accessibly written.

- Peter Kennedy, *A Guide to Econometrics*, 6th edition, Wiley-Blackwell, which is more concise and provides a more informal overview of some of the material we'll cover in the course.

Keep in mind that your most important source of material will be your class notes. The class does not follow any one particular book. I provide chapter references in the course outline below, but lectures may omit some of the material covered in those chapters, present it in a different order, or talk about things that aren't in the chapters at all.

There are also a number of books that can help as you learn to work with Stata and LaTeX:

- Helmut Kopka, and Patrick W. Daly, *Guide to LaTeX*, 4th edition, Addison Wesley. This is a terrific and relatively affordable introduction to LaTeX. Sometimes it can be useful to have an actual book like this in front of you as you struggle with LaTeX. Keep in mind that there are also many excellent, free introductions to LaTeX available on the web. We'll link to or post some of them on Blackboard.

- Colin Cameron, and Pravin K. Trivedi, *Microeconomics Using Stata*, Revised edition, Stata Press. A great resource and useful as a complement to the extensive documentation that comes with Stata. The book sometimes assumes that you already know a fair amount of microeconomics. A somewhat more accessible alternative is Lawrence C. Hamilton's *Statistics with Stata*, updated for Stata 10, Brooks/Cole.

Schedule

September 27 and 29: Introduction to data analysis. Summarizing and displaying univariate data. Probability fundamentals.

Readings: Wackerly et al., ch. 1 and 2

Lab (September 30): Introduction to LaTeX.

October 4 and 6: Discrete and continuous probability distributions.

Readings: Wackerly et al., ch. 3 and 4

Lab (October 7): Introduction to Stata.

October 13 and 18: Multivariate probability distributions. The notion of independence. The Central Limit Theorem.

Readings: Wackerly et al., parts of ch. 5 and 7

Lab (October 14): Generating random variables.

October 20: Estimation and properties of point estimators. Hypothesis testing.

Readings: Wackerly et al., parts of ch. 8-10

Lab (October 21): The Central Limit Theorem.

October 25: Covariance and Correlation. Visualizing Relationships between variables. Introduction to the linear model.

No lab (October 28)

OCTOBER 27: IN-CLASS MIDTERM EXAM

November 1 and 3: The classical linear regression model. Derivation of ordinary least squares (OLS) estimates.

Readings: Wooldridge, ch. 2

Lab (November 4): Visualizing data. Correlation and regression.

November 8 and 10: Properties of OLS in finite samples. Unbiasedness and efficiency. Gauss-Markov assumptions. Variance of OLS estimates.

Readings: Wooldridge, ch. 3

Lab (November 11): Linear regression.

November 15 and 17: Inference and hypothesis tests in the linear model. Goodness of fit. Confidence intervals.

Readings: Wooldridge, ch. 4

Lab (November 18): Hypothesis tests.

November 22 and 29: Misspecification and bias. Omitted variables. Multicollinearity. Measurement error.

Readings: Wooldridge, parts of ch. 6 and 9

No lab (November 25)

December 1 and 6: Violations of the Gauss-Markov assumptions. Non-spherical errors. Heteroskedasticity.

Readings: Wooldridge, ch. 8

Lab (December 2): Testing and correcting for violations of Gauss-Markov.

December 8: Introduction to simultaneous equation bias and models.

Readings: Wooldridge, ch. 16

Lab (December 9): Review.

December 13: Review.

DECEMBER 15: 24-HOUR TAKE-HOME FINAL DISTRIBUTED.