Syllabus for Political Science 7963/Sociology 7203
Spring 2009
~~Advanced Research Methods in Social Science~~
Applied Regression/ Multivariate Statistics/ Econometrics
Professor Rosanne Scholl

Details

We will meet on Fridays from 9:10 to 12 noon in 210 Stubbs. Bring coffee.

My office hours are Thursdays from 12:30 to 2:30 in 204 Hodges. Hodges Hall is between Stubbs Hall and the stadium, next to the Journalism Building. You are welcome to drop by my office at other times or to e-mail rscholl @ lsu .edu to set up an appointment.

About this course

What's it about? In your introductory statistics course (you took one, right?) you learned about how to tell whether one characteristic related to another characteristic according to evidence in data. Although it was a necessary first step, this was boring: what we really want to know is how *multiple* characteristics are related. For example, a *t*-test lets you know whether men, on average, trust government more than women. It asks whether the data support the existence of a relationship between two characteristics: trust in government and gender. With this course, you can test whether men have higher (or lower) trust than women *after taking their political ideology into account*. This is a much more interesting question. Write down a multivariate research question from your field of study here:

The title of this course is all wrong. It should be called "Econometrics" or "Multivariate regression" or "Applied Quantitative Analysis." The material is not "advanced": regression is considered a basic technique in all social sciences. Furthermore, this particular course is a fairly basic treatment of regression, which is often taught using linear algebra- based proofs. Many courses of this type require calculus, at least, as a prerequisite. I do not assume any more math preparation than that which got you through your introductory statistics course. Therefore, this is an "applied" course: you will learn the right ways to do regression, and why; but this course will not make you a methodologist. If you plan to get a job teaching political science and you use quantitative methods, you should advance further in your studies. Neither is this course a "research methods" course. We will not cover sampling, surveys, or research design, even though understanding those methodological choices is crucial to research where one might use the statistical techniques taught in this class. "Social Science" is the only part of the official title that fits: this course is appropriate for anyone interested in quantitative research in any social science. My research and training is in political communication and economics, so many of my examples will be from these areas.

How much work is this course? Lots. You will spend many more hours outside of class than in class in order to get what you came for in this course. I strongly encourage study groups to hold regular meetings. The problem sets are not intended to be completed in one sitting. Statistical software is best 'learned by doing.'

Objectives: After you have finished this course, you will:

1) Be able to explain the basic logic of multivariate statistical analysis
2) Understand the math behind ordinary least squares regression
3) Know when regression is and is not an appropriate analysis technique
4) Be able to interpret and critique multivariate results in journals
5) Be able to apply appropriate techniques to your own data
6) Be proficient with a statistical software package to analyze data
7) Correctly interpret and report your multivariate analysis results

Course materials

You need access to 5 kinds of material for this course. Most students will choose the boldface options.

1) At least one econometrics book (required)
   - Recommended for students without math backgrounds: **"A Guide to Econometrics" by Peter Kennedy** or "Essentials of Econometrics" by Gujarati & Porter. Kennedy has been compared to the Cliff's Notes for Econometrics: useful, but you shouldn't read it on its own. A more complete text is strongly recommended in addition to (or instead of) Kennedy.
   - Recommended for applied methods: **"Basics of Econometrics" by Damodar N. Gujarati**. This is a complete treatment, and is the text assigned by recent professors of 7963. It is very popular in political science econometrics courses. It is a little less comprehensive than Wooldrige, Greene or Hayashi. It assumes more math background than is required to enroll in 7963.
   - Recommended for methodolgists or quantitative political scientists: "Introductory Econometrics" by Wooldrige, "Econometric Analysis" by Greene, or "Econometrics" by Hayashi. These texts are expensive; however, last year's edition is just fine.
2) Statistical software (some kind of access is required, purchase or "borrowing" recommended)
   - **Stata.** This is the most commonly used package in political science. It is available through LSU at a discount, and is also available in Middleton Library.
   - SPSS, SAS, R, or any other software capable of linear regression analysis. I am most familiar with SPSS and SAS (more than Stata). SPSS is common in Mass Communication and Psychology; SAS is common in consulting and business. R is free, open-source software that is the next big thing in political science. Stata and SPSS are the most user-friendly packages.
3) A book on how to use your chosen statistical software (strongly recommended). For instance, **"An Introduction to Modern Econometrics Using Stata"** by Christopher F. Baum. Here are some useful Stata tutorials: http://www.cpc.unc.edu/services/computer/presentations/statatutorial and http://www.ats.ucla.edu/stat/stata/ .
4) The **data** for your problem sets (required): Comes with "An Introduction to Modern Econometrics Using Stata." You can analyze this data for your problem sets using any of the stats software packages.
5) **Data** for the "analyze your own data" problem set (required).

Academic Honesty

Academically dishonest graduate students get an F in the course, are suspended for a semester, and are sometimes not re-admitted. Here is the policy, which you are responsible for knowing: www.lsu.edu/judicialaffairs/AI.htm

Lecture Schedule, Grading, and Due Dates

You should do the reading before class, and probably look at it again during the weekend after class. Problem sets will include written, mathematical, and software components and will likely require many hours to complete.

Week	Date	Lecture topic	Reading in Kennedy	Reading in Gujarati	Assignment due at beginning of class	Points
1	1/16	Introduction to the course; What are econometrics and regression?				
2	1/23	Univariate statistics review	a univariate textbook; Ch. 1	Intro, Ch. 1, App. A, App. B		
3	1/30	Estimators, ordinary least squares	2, 3	2-4, App.C	Univariate review problem set	5
4	2/6	Hypothesis testing, models	3 again,4,5	5-8		
5	2/13	Assumptions 1 and 2: Misspecification, Nonlinearity, Nonzero disturbance terms	6, 7	Intro to Part 2	Linear regression problem set	10
6	2/20	Assumption 3: Heteroskedasticity, Error autocorrelation	8	11, 12		
7	2/27	Catch-up and review			Oral progress reports on data and model for 'Own Data' assignment	Not for a grade
8	3/6	Midterm exam				20
9	3/13	Assumption 4: Instrumental variables, Measurement error	9,10			
10	3/20	Assumption 4: Autoregression Assumption 5: Multicolinearity	11,12	10, 13		
11	3/27	Dummy variables Interaction effects	15	9, 14	Assumptions problem set	10
12	4/3	Probit and logit models	16			
13	4/10	Time series analysis	19	21		
14	4/17	Spring break!				
15	4/24	Panel data analysis	18	16	Advanced techniques problem set	10
16	5/1	Exam Review, "The Ten Commandments"	22		'Analyze your own data' problem set	20
	?	Final exam				25

The final exam will be given at the time and day assigned by LSU for Friday morning courses.
Total points in course: 100. Students who earn 90 to 100 points earn an 'A' in the course; 80 to 89 points merit a 'B', and so forth. I may make this scale more generous, but I will never make it stricter.