IR 611: Multivariate Analysis for International Studies
Professor: Benjamin Graham
Course Meetings: Mondays 2-4:50 PM
Course Location: THH 113
Office Hours: Tuesdays 2:30-3:45 PM and by appointment
Office: SOS B9
Version: January 10, 2014

The goals of this course are to:
1. Enable you to read quantitative research intelligently
2. Teach you several basic techniques for quantitative hypothesis testing.
3. Enable you to manage and manipulate datasets for large-n research projects
4. Provide you skills for self-teaching or working with co-authors using more sophisticated techniques in the future.
5. Provide you with a working knowledge of STATA to facilitate 2-4.

The first part of the course focuses on the derivation, estimation, and application of linear regression. The second part of the course covers violations of the assumptions of the linear regression model and methods that are used when these assumptions are violated.

The course will cover both the derivation and properties of estimators, as well as practical applications through data analysis using STATA, a statistical software package. The goal of the course is to provide students with an introduction to the tools that are necessary to conduct quantitative research in political science.

Required Text and Software
Other editions will also suffice. You may need to find the corresponding sections/pages, but I don't anticipate that will be too difficult
I will also post additional course readings on the course website,

STATA IC (version 12 or later). While this software is available on lab computers, I require each student to install a copy on their own computer. One of the assets you will leave this course with is a library of STATA .do files (i.e. code for data analysis) that you have written and annotated yourself, and which you can use as a template in future work.

Students with Disabilities
Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. The
Academic Dishonesty
I take academic dishonesty seriously. Any student violating USC’s Academic Dishonesty or Student Conduct policies will earn an ‘F’ in the course and will be reported to the appropriate administrators for investigation. You should review the Trojan Integrity Guide: [http://www.usc.edu/student-affairs/SJACS/forms/tio.pdf](http://www.usc.edu/student-affairs/SJACS/forms/tio.pdf) and the guide for avoiding plagiarism: [http://www.usc.edu/student-affairs/SJACS/forms/tig.pdf](http://www.usc.edu/student-affairs/SJACS/forms/tig.pdf)

Assignments
*Homework and Participation-50%*
We will have a variety of homework assignments. Assignments will consist of mostly of problem sets related to regression, and working with data sets in STATA. Homework will be assigned in class and will be due at the beginning of class on the due date. Late homework will not be accepted. If you do not turn in an assignment on time, you will receive a zero on that homework.

*Final Paper-50%*
Students are required to submit a final paper on the last day of class. In the paper, students should use the statistical skills learned in class to analyze data related to a topic of interest. They should be double-spaced and no longer than 20 pages (including tables, graphs, references, and appendices. I will discuss more details about the paper as the semester progresses. Essentially you will briefly outline a theory you want to examine empirically, then you are to present your research design and your statistical analysis. I do not want you to focus on theory development or explication in this paper. You only need to have enough theory to explain the hypotheses or prediction that you will test.

*Schedule of Topics: Readings my change as the semester progresses*

**Week 1 (January 13)– Course Overview. The Research Design Context, Begin Describing Data**

**Week 2 – MLK (No Class)**
Reading: Pollock, pp. 111 - 174

**Week 3 (Jan 27)– Describing Data and Introduction to Quantitative Hypothesis Testing**

**Week 4 (February 3)– The Regression Approach to Political Science**
Gujarati, Intro and Ch. 1

**Week 5 (February 10) Simple Linear Regression**
Gujarati, Chapter 2 and 3

**Week 6 – Feb 17**  - President’s Day (No Class)

**Week 7 – Feb 24**  - Assumptions of Linear Regression
Gujarati, Chapters 4 and 5, Review 3.3 and 3.4

**Week 8 (March 3): Hypothesis Testing & Heteroskedasticity**
Gujarati Chapter 5

**Week 9- Mar 10** - Multiple Regression
Gujarati, Chapter 7 & 8

**March 17:** Spring Break

**Week 10 – Mar 24** – Multiple Regression (continued), also Interaction Terms

**Week 11 – Mar 31:** Multicollinearity and Outliers
ISA
Gujarati, Chapter 10

**Week 12 – April 7: Autocorrelation: Just enough out panel data to be dangerous**
Gujarati, Chapter 11 & 12
Also: Reading the regression tables in Leblang's 2010 APSR.

**Week 13 (April 14)-Logit and Probit**
Gujarati, Chapter 15

**Week 14- April 21: Misc and Summary:**

**Week 15 – April 28: Student presentation of final projects**
Learning to use STATA
http://www.ats.ucla.edu/stat/stata/
http://dss.princeton.edu/online_help/stats_packages/stata/stata.htm

Supplementary materials available on the Internet:
An excellent introduction to statistics and research design is Statistics at Square One
-- http://bmj.com/collections/statsbk/index.shtml, see especially Chapter 5 --
http://bmj.com/collections/statsbk/5.shtml

Good websites on statistics, econometrics, including free downloadable software for
data entry, data analysis, research design, hypothesis testing, document preparation
and presentation include:
http://davidmlane.com/hyperstat/index.html
http://members.aol.com/johnp71/javasta2.html#Freebies

Online readings on the scientific method:
http://www.lse.ac.uk/collections/lakatos//
http://galileoandeinstein.physics.virginia.edu/lectures/lecturelist.html
http://teacher.nsrl.rochester.edu/phy Labs/AppendixE/AppendixE.html
http://plato.stanford.edu/entries/popper/
http://www.brint.com/papers/science.htm
http://www.emory.edu/EDUCATION/mfp/Kuhnsnap.html
http://wwwcdf.pd.infn.it/~loreti/science.html