

POLS 603: Quantitative Political Analysis II

Texas A&M University

Spring 2007

Tu, 9:30 AM - 12:20 PM, Allen 2064

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Course Description

The main purpose of this class is to provide you with a mastery of the basic regression model—understanding both the statistical theory behind its use in political science and a deep understanding for application to your own work. My assumption is that what happens to be in vogue in political methodology will change rapidly and, more importantly, the methods you will need in your own research will lead you in unpredictable directions that cannot be anticipated in this class. Mastery of the underlying statistical theory behind regression will provide the background necessary to quickly master new applications as you need them.

To that end, the class starts with an introduction to matrix algebra, followed by an introduction to statistical, probability, and distributional theory. In many ways, this may be the most important portion of the class. I do not believe you need to know this material off the top of your head—I certainly do not—but it is important that you understand how to read works that use this theory, and know where to look to understand what is occurring “behind the scenes” of our statistical models. In short, from beginning to end, we are trying to avoid the common situation that your statistical work might be something of a black box to you. Then the course moves to a mathematical introduction of the general linear regression model and some of its numerous extensions.

Required Text and Other Readings

You should purchase purchase copies of the following books:

- Greene, William H. 2003. *Econometric Analysis, Fifth Edition*. Upper Saddle River, NJ: Prentice Hall.

- Gill, Jeff. 2006. *Essential Mathematics for Political and Social Research*. New York: Cambridge University Press

I reserve the right to add readings from time to time during the semester. In most cases, such readings will represent article-length substantive applications of the methodological problem under study.

Grades

Your grade in the course will be determined by your performance on two exams, a term paper, and several homework assignments and in-class quizzes. The first exam will be in class (on March 6) and will last 2 hours. It will contribute 25% to your final grade. The final exam will be cumulative and broad in nature, and will be of the take-home variety. We will decide upon a mutually agreeable due-date as the time approaches. It will contribute 25% to your final grade. The term paper will be an empirical paper which utilizes one or more of the methods taught in this course to answer a substantive question of interest to political scientists. You should discuss your paper topic with me sometime in the first four or five weeks of the term. The paper will contribute 25% to your final grade. The homework assignments will be given on a regular (but not weekly) basis, and will be due the following week. Generally speaking, I will allow you to work collaboratively on the homework assignments. Finally, I will give several in-class (and unannounced) quizzes to keep you on your toes. The homeworks and quizzes will total 25% of your final grade.

Course Calendar

*Please read the assigned readings **before** the class period for which they are assigned. Note also that I reserve the right to change the following calendar in order to ensure that we spend adequate time on each topic. Of course, if such changes become necessary, I will make an announcement in class.*

Week 1 January 16: Course introduction

- Greene, ch. 1

Week 2 January 23: Matrix algebra

- Gill, chs. 3 and 4
- Greene, Appendix A

Week 3 January 30: Probability theory and statistical inference

- Greene, Appendices B and C
- King, Gary. 1986. “How not to Lie with Statistics: Avoiding Common Mistakes in Quantitative Political Science.” *American Journal of Political Science* 30(3):666-87.

Week 4 February 6: The classical multiple linear regression model

- Greene, chs. 2 and 3

Week 5 February 13: Regression assumptions—what happens when we get them right

- Greene, ch. 4

Week 6 February 20: Inference and prediction

- Greene, ch. 6 and 8.4
- King, Gary, Michael Tomz, and Jason Wittenberg. 2000. “Making the Most of Statistical Analyses: Improving Interpretation and Presentation.” *American Journal of Political Science* 44:347-61.

Week 7 February 27: Specification problems

- Greene, chs. 7, 8 and 5

Week 8 March 6: Midterm exam

Week 9 March 13: No class, spring break

Week 10 March 20: Heteroskedasticity

- Greene, chs. 10 and 11

Week 11 March 27: Autocorrelation

- Greene, ch. 12

Week 12 April 3: Maximum likelihood

- Greene, ch. 17

Week 13 April 10: Discrete choice

- Greene, ch. 21

Week 14 April 17: Time series, part 1

- Greene, ch. 19
- Keele, Luke and Nathan J. Kelly. 2006. "Dynamic Models for Dynamic Theories: The Ins and Outs of Lagged Dependent Variables." *Political Analysis* 14:186-205.

Week 15 April 24: Time series, part 2

- Greene, ch. 20

Statement about Students with Disabilities

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room 126 of the Koldus Building, or call 845-1637.

Statement about Course Materials/Copyright and Plagiarism

The materials used in this course are copyrighted. By "materials," I mean anything generated for this class, which include but are not limited to syllabi, presentations, web pages, quizzes, exams, lab problems, in-class materials review sheets, and additional problem sets. Because these are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission.

As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with the definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of the person. Plagiarism is one of the worst academic sins, for

the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have any questions regarding plagiarism, please consult the Texas A&M University web site, <http://aggiehonor.tamu.edu>.