POLS 7014: Intermediate Political Methodology

Spring 2017

Instructor
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Office Hours: Monday 1:30–3:30 PM
        and by appointment

Class Schedule
Thursday 3:30–6:15
Candler Hall 214

Introduction

This course is the third course in the graduate methods sequence. This course will focus on a particular statistical model used throughout the social sciences — the linear regression model. We will learn how to estimate the linear regression model and perform inference with it. We will learn how to identify and resolve potential problems common when estimating linear regression models. Finally, we will learn about a few models that extend beyond the standard linear regression model.

In addition to these statistical issues, we will also discuss how the results of regression analysis should be presented. We will practice both writing about regression analysis and presenting the results of regression analysis via tables and graphs.

Requirements and Evaluation

The main requirements of the course are to attend class, keep up with the readings, turn the homework assignments in on time, and ask lots of questions. We will attempt to cover a great deal of technical materials during the semester and will go as quickly or as slowly as is necessary to adequately cover the material.

Evaluation for the course will be based on homework assignments, a mid-term exam and a final exam. There will be between 8 and 10 homework assignments due during the semester. The assignments will be a combination of analytical problems, computer-generated graphs, and written essays and research notes. I encourage students to work together on assignments, but students must write up the assignments on their own. Late assignments will not be accepted unless prior arrangements have been made. Homework assignments will count for 40% of the final grade. The mid-term exam will count for 25% of the final grade. The final exam will count for the remaining 35% of the final grade. If you think you may miss an exam I need to know immediately.

Readings and Software
Required Texts
There are three required texts for this course. The first, is designed to be an undergraduate text, but covers many of the methods used in political science research. We will begin the class by rapidly going through this text:

> Agresti, Alan, and Barbara Finlay. *Statistical Methods for the Social Sciences*, any edition. Upper Saddle River, NJ: Prentice Hall.

The second is a very good applied regression textbook and will be used extensively throughout the course:

> Fox, John. 2016. *Applied Regression Analysis and Generalized Linear Models, 3rd edition.* Thousand Oaks, CA: Sage Publications. (ISBN 978-1-4522-0566-3).

The third is a companion book to the main textbook that focuses on using R to perform statistical analysis:

> Fox, John. 2011. *An R and S-Plus Companion to Applied Regression, 2nd edition.* Thousand Oaks, CA: Sage Publications. (ISBN 978-1-4129-7514-8).

Supplemental Texts
There are a number of additional books that you may find useful throughout the class. The first two of these are books which broadly cover the basic mathematics used in this course and in political science in general. They are both great reference books to have around when you need a little help with algebra, calculus, linear algebra, or more difficult mathematical topics.

> Gill, Jeff. 2006. *Essential Mathematics for Political and Social Research.*

> Simon, Carl P. and Lawrence Blume. *Mathematics for Economists.*

There are many alternative statistics textbooks which you may want to make use of during the semester. If you are struggling to learn a concept in one textbook, reading about the same concept in a different textbook may quickly clear things up. Here is one that I find to be useful. There are many other books out there and I would be happy to recommend more supplemental texts, if you are interested.

> Kennedy, Peter. *A Guide to Econometrics.*

Software
Becoming comfortable with statistical software is an important part of this course. I use R and will teach this course using R. While you are welcome to complete your homework assignments in any statistical package with which you are comfortable, I encourage you to use R in this course. R is a very good statistical software package that is available for free at www.r-project.org. The Fox R companion text we will be using for class is a great introduction to the software. Perhaps the more important reason for you to use R is that homework assignments for the course are likely to closely mirror the exercises and examples in Fox's R companion book.

R can be a difficult program to learn. I recommend that you look through "An Introduction to R" on the R website (r-project.org) for a basic introduction. The R website also has a great number of R-related resources. Quick-R (statmethods.net) is a resource many students find to be helpful. There are also several other books and resources I can recommend if you are interested.

Additional Readings
There are a few additional readings for the course. You will either receive a copy of these readings from me or a copy will be easily accessible on the internet.

Other Issues

1. **Disabilities**: Students with disabilities of any kind are strongly encouraged to tell me at the beginning of the semester, so appropriate accommodations can be made. Students with disabilities that have been certified by the UGA Disabilities Services Office will be accommodated according to university policy. Contact Disabilities Services for more information.

2. **Instructor Availability**: I am available to meet with students by appointment if anyone cannot attend my posted office hours. Please email me to schedule a meeting.

3. **Technology in the Classroom**: Technology, used correctly, has the potential to greatly improve the quality of our lives. Technology, used incorrectly, has the potential of making the instructor very angry. Turn off your cell phone while in class (some exceptions may apply - e.g. you a transplant surgeon anxiously awaiting the arrival of a donor heart). Laptops may be used to take notes in class. Texting is never appropriate in class, unless it is to give your friends newly learned tips on how to deal with model heteroskedasticity. While live tweeting of class lectures is encouraged, many of the concepts we will cover may be difficult to explain in 140 characters.

4. **Cheating and Plagiarism**: All course work must meet the standards put forth in the University of Georgia's Student Honor Code. See the Academic Honesty Policy for details on what is expected of you (https://ovpi.uga.edu/sites/default/files/uga-academc-honesty-policy-may-07.pdf).

Tentative Course and Topics Schedule

January 5   **Introduction to Inference**
Berry, Donald A. and LeeAnn Chastain. 2004. "Inferences about Testosterone Abuse among Athletes." *Chance* 17(2): 5-8.
Bailey, Michael. 2012. *Real Stats: Experiments, Data, Policy, Politics, and Law.* Chapters 2 and 3.

January 12   **SPSA-No Class**

January 19   **Significance Testing**
Agresti and Finlay (1997) Chapters 1-6.

January 26   **Inference**
Agresti and Finlay (1997) Chapters 7-8

February 2   **Examining Data/ R Tutorial**
Fox (2008) Chapters 2–3
Fox (2011) Chapters 1–3.3, 7
King, Gary. 1991. "On Political Methodology." Sections 1-3. *Political Analysis.* 2:1-30. (gking.harvard.edu/files/polmeth.pdf)
Healy, Kieran and James Moody. 2014. "Data Visualization in Sociology." *Annual Review of Sociology* 40:105-128.

February 9   **Linear Regression**
Fox (2008) Chapters 5.1, 6.1
Fox (2011) Chapters 4.1–4.2

February 16   **Multiple Regression**
Fox (2008) Chapters 5.2, 6.2–6.4
Fox (2002) Chapters 4.1.– 4.9

February 23   **Review and Dummy-Variables**
Fox (2008) Chapter 7

March 2   **Midterm Exam**

March 9   **Spring Break-No Class**

March 16   **Interactive Terms**

Brambor, Thomas, William Roberts Clark, and Matt Golder. 2006. "Understanding Interaction Models: Improving Empirical Analyses." *Political Analysis*. 14:63–82.

Friedrich, Robert J. 1982. "In Defense of Multiplicative Terms in Multiple Regression Equations." *American Journal of Political Science*. 26(4): 797–833. (recommended)

March 23   **Assumptions of OLS/Transformations**

Fox (2008) Chapter 4

Fox (2011) Chapter 3.4 Berry, William D. 1993. *Understanding Regression Assumptions*. Newbury Park, CA: Sage Publications. pp. 1-12.

March 30   **Linear Models in Matrix Form**

Fox (2008) Chapter 9

April 6   **MPSA-No Class**

April 13   **Influential Data and Nonlinearity**

Fox (2008) Chapter 11 and 13

Fox (2011) 6.2–6.6 Kahn, Joan R. and J. Richard Udry. 1986. "Marital Coital Frequency: Unnoticed Outliers and Unspecified Interactions Lead to Erroneous Conclusions." *American Sociological Review*. 51(5): 734-737.

April 20   **Collinearity and Review**

Fox (2008) Chapter 13

Fox (2011) 6.7

May 4 (7:00PM-10:00PM)   **Final Exam**