PS 572-401: Introduction to Quantitative Political Methodology

Course Time: MW 6:00-7:15pm
Location: Whitehall Classroom Bldg, Rm. 342
Course Website: http://www.uky.edu/~clthyn2
Instructor: Dr. Clayton Thyne
Office Hours: MW 12:30-2:00pm
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Learning Objectives
The purpose of this course is to introduce students to basic quantitative concepts and techniques as commonly applied in political science research. Although it is primarily oriented toward preparing graduate students in Political Science for methodological training within the discipline – and therefore reflects the needs of academic professionals – it also is a useful way for the most advanced undergraduate concentrators in Political Science to learn hands-on research skills. We will begin with some basic techniques such as cross-tabulation, difference of means, analysis of variance, and others, and conclude with an introduction to correlation and regression analysis. Although you will be expected to demonstrate your understanding of the concepts introduced in this course through the completion of computational exercises, this course will place a heavy emphasis on applying these techniques using statistical software.

Learning Outcomes
At the end of this course, students will have learned:
  a) Basic mathematical & statistical skills needed to study Political Methodology at the graduate level.
  b) Theories behind the analytical approaches used in Political Science disciplinary research.
  c) How to perform quantitative analysis using the software and statistical methods published in Political Science journals.

Required Texts (Available at UK Bookstore)
  (1) *Introductory Statistics.* Wonnacott & Wonnacott, Wiley and Sons, 5th Edition.
  (2) *Statistics with Stata 9.* Lawrence Hamilton, Duxbury Press.
  (3) *A Stata Companion to Political Analysis*. Philip Pollock III, CQ Press.

Recommended/Optional Texts
    (1) *Applied Regression.* Michael Lewis-Beck, Sage Publications.
    (2) *Stata Reference Manual Extract*. Stata Press (Available from Stata website)

Statistical/Computer Skills Needed For This Course
This course assumes *no* prior training in statistics or *advanced* mathematics, but does require that you have taken college algebra. It also assumes that students have, or will get, access to a computer that connects to the Internet and that they have basic computer skills such as familiarity with Windows and a word processor. Finally, you must have or get an active email account that you check on a regular basis.

The statistical software used in this course is STATA 9.0 (or 10.0) for Windows. This software is available in our departmental computer lab, which is accessible 24 hours a day, 7 days a week (although you can't get into the building after 11pm or before 6am).

Class Format
The class sessions for this seminar will involve a few different types of formats. Most of the time this will be the traditional lecture format in which I will present material to the class. On some days, I will demonstrate how to implement the techniques you have learned using STATA. On several occasions, we will also examine how these techniques have been applied in published examples from leading social science journals.

Course Requirements
Reading: For most weeks, the amount of reading is rather light by graduate school standards (in terms of the number of pages). This is deceiving. I expect that it will often take two or three readings to thoroughly comprehend the material (especially from the main text), especially as the semester progresses. Even after reading the material, you still may have questions. It is therefore important that you get started early in the week so that any questions you have can be resolved before class.

Homework Assignments: Throughout the semester, you will be required to complete three types of assignments. First, you will be asked to complete computational exercises based on the reading for the week. Second, you will be required to complete computer-based exercises using STATA (usually applying the techniques covered in the text). Third, you will be required to turn in exercises from Pollack (just tear them out of the workbook). Computational assignments (usually exercises in the textbook) may be NEATLY hand written or done in a spreadsheet (or you may type them). No hand-written work will be accepted for other types of assignments. Late assignments will not be accepted.

Participation: We regularly review the homework assignments in class and occasionally will work through problems together. You are expected to contribute to these exercises regularly.

Exams: There will be three exams at the dates listed below in the Course Schedule.

Grading
      Exam #1: 25%
      Exam #2: 25%
      Exam #3: 25%
      Homework Assignments: 20%
      Participation: 5%
Students will be graded on a 10-point scale, with 90-100 an A, 80-89 a B, 70-79 a C. Undergraduates receiving a course grade from 60-69 will receive a D. All others receive an E, failing the course.

<u>Course Schedule</u>

08/27 (Wed): Syllabus review, course expectations

09/01 (Mon): Labor day – no class

09/03 (Wed): The Nature of Statistics
- Be prepared to discuss WW Chp. 1
- Be familiar with the Stata commands in Hamilton Chp. 1-2, especially:
  - use, summarize, describe, tabulate, search, browse, edit, compress, generate, set memory, sort, rename, label order, list, if, >, <. <=, >=, ~=, !=, keep, drop, replace, display, merge, save, collapse
  - play around with these using a dataset of your choice, or just download the datasets I've made available at:
    - http://www.uky.edu/~clthyn2/data_set_1.dta (an IR example dataset)
    - http://www.uky.edu/~clthyn2/data_set_2.dta (an American example)

09/08 (Mon): Descriptive Statistics
- Be prepared for WW Chp. 2
- Turn in Exercises from Pollock chp. 1 (page 17) at the beginning of class
- Be familiar with the Stata commands in Hamilton Chp. 3-4, especially:
  - histogram, graph box, qnorm, graph hbox, stem, sktest, ladder, gladder, qladder

09/10 (Wed): Descriptive Statistics (continued)
- Be prepared for WW Chp. 2
- Receive Chp. 1-2 assignment

09/15 (Mon): Probability
- Be prepared for WW Chp. 3
- Turn in Chp. 1-2 assignment at the beginning of class
- Turn in Exercises from Pollock chp. 2 (pages 35-40) at the beginning of class

09/17 (Wed): Probability (continued)
- Be prepared for WW Chp. 3
- Receive Chp. 3 assignment

09/22 (Mon): Probability Distributions
- Be prepared for WW Chp. 4
- Turn in Chp. 3 assignment at the beginning of class

09/24 (Wed): Probability Distributions (continued)
- Be prepared for WW Chp. 4
- Turn in Exercises from Pollock chp. 3 (pages 55-57) at the beginning of class
- Receive Chp. 4 assignment

09/29 (Mon): Two Random Variables
- Be prepared for WW Chp. 5
- Turn in Chp. 4 assignment at the beginning of class

10/01 (Wed): Two Random Variables (continued)
- Be prepared for WW Chp. 5
- No assignment (study for your exam)

10/06 (Mon): Exam #1 over WW Chp. 1-5

10/08 (Wed): Sampling
- Be prepared for WW Chp. 6
- Receive exam grades

10/13 (Mon): Sampling (continued)
- Be prepared for WW Chp. 6
- No assignment due

10/15 (Wed): Point Estimation
- Be prepared for WW Chp. 7
- Receive Chp. 6 assignment

10/20 (Mon): Point Estimation (continued)
- Be prepared for WW Chp. 7
- Turn in Chp. 6 assignment at the beginning of class
- Play around with the following Stata commands: ttest, ci, drawnorm, expand

10/22 (Wed): Confidence Intervals
- Be prepared for WW Chp. 8
- Receive Chp. 7 assignment

10/27 (Mon): Confidence Intervals (continued)
- Be prepared for WW Chp. 8
- Turn in Chp. 7 assignment at the beginning of class

10/29 (Wed): Hypothesis Testing
- Be prepared for WW Chp. 9
- Turn in Exercises from Pollock chp. 6 (pages 116-117) at the beginning of class
- Receive Chp. 8 assignment

11/03 (Mon): Hypothesis Testing (continued)
- Be prepared for WW Chp. 9
- Turn in Chp. 8 assignment

11/05 (Wed): Analysis of Variance (ANOVA)
- Be prepared for Chp. 10
- Receive Chp. 9 assignment
- Be familiar with the following Stata commands: ttest, oneway, anova,

11/10 (Mon): Analysis of Variance (ANOVA) (continued)
- Be prepared for Chp. 10
- Turn in Chp. 9 assignment

11/12 (Wed): Summary and Extension of WW
- Review chp. 6-10
- We'll be covering info that WW missed; notes to be taken from me

11/17 (Mon): Summary and Extension of WW (continued)
- Review chp. 6-10
- We'll be covering info that WW missed; notes to be taken from me

11/19 (Wed): Summary and Extension of WW (continued)
- Review chp. 6-10
- We'll be covering info that WW missed; notes to be taken from me
- Turn in Exercises from Pollock chp. 7 (pages 130-135) at the beginning of class

11/24 (Mon): Exam #2 over WW Chp. 6-10 and info covered on 11/12-11/19

11/26 (Wed): Thanksgiving break – no class

12/01 (Mon): Fitting a Line
- Be prepared for WW Chp. 11
- Receive graded exams
- Be familiar with the following Stata commands: graph twoway lfit, regress

12/03 (Wed): Fitting a Line (continued)
- Be prepared for WW Chp. 11
- Receive Chp. 11 assignment

12/08 (Mon): Simple Regression
- Be prepared for Chp. 12
- Turn in Chp. 11 assignment
- Be familiar with the following Stata commands: predict, resid, lowess, hottest, rvfplot, dwstat, kdensity, qnorm, swilk, estimp,

12/10 (Wed): Simple Regression (continued)
- Be prepared for WW Chp. 12

- Turn in Exercises from Pollock chp. 8 (pages 150-155) at the beginning of class

12/15 (Mon) at 6pm: Final Exam covering WW Chp. 11-12