

Political Science 502
Methods of Political Analysis
Fall 2006

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University of South Carolina
MWF 10:10 - 11:00 AM
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Description

This course provides an introduction to the theory and practice of statistical analysis in political science. The course has two principal goals: 1) to aid students in understanding and evaluating quantitative analyses in political science, and 2) to provide the necessary foundation for students to design and conduct their own quantitative research in political science. Much of the lectures will focus on statistical theory, which is necessary for understanding the methods that quantitative political scientists employ in their research. However, my end goal is not to turn students into statisticians. Instead, it is to aid students in becoming the most effective researchers they can become.

There are no prerequisites for the course other than a willingness to learn, a commitment to reading the course material prior to class, and a dedication to working one's way through the homework assignments and exams. In other words, I do not assume that students enter the course with previous training in statistics, but I do assume that students enter the course with a commitment to learning how to apply statistical analysis in political science research.

Many students enter their first graduate statistics course with some concerns and trepidations. The key to overcoming these concerns is to recognize that the best political scientists are always dedicating themselves to becoming better scholars. The best political scientists, in short, are those who recognize that they have much to learn and dedicate themselves to doing so. The only way to do so is to not be afraid to make mistakes and always be willing to ask questions in order to improve oneself as a scholar. It's important, therefore, to ask questions in class and to come to office hours if you don't understand portions of the material. If you commit yourself to working hard in this course you will get much more out of it and will have taken a critical step toward becoming a strong scholar.

Texts

There are two assigned texts and one recommended text. All are available at campus bookstores.

The required texts are:

Wonnacott, Thomas H., and Ronald J. Wonnacott. 1990. *Introductory Statistics*, 5th ed. New York: John Wiley and Sons.

Abelson, Robert P. 1995. *Statistics as Principled Argument*. Hillsdale, NJ: Lawrence Erlbaum Associates.

The recommended text is:

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

The Wonnacott and Wonnacott text (abbreviated W & W in the readings listed below) will be our primary text. It provides an understandable presentation for students in a first graduate statistics course. The Abelson book (abbreviated AB in the readings below) is a very handy guide for conducting quantitative research in the social sciences. Abelson provides insights into why to study statistical theory as well as a how-to-guide for good practices in quantitative research. Gill's recently published text provides an excellent introduction to matrix algebra, calculus, and probability theory.

Additional readings will be available, as necessary, on Blackboard.TM

Grading

Grades in this course will be determined as follows:

- Class Participation (10% of the course grade)
- Homework Assignments (30% of the course grade)
- Midterm Exam (30% of the course grade)
- Final Exam (30% of the course grade)

Class participation and attendance are essential for success in the course. Because the material builds on concepts learned earlier in the course, a slow start can hurt considerably later in the semester. As a result, it's essential that you come to lectures prepared by having read the material before class. Clearly, it's very difficult to get class participation points if one does not attend class. Class attendance is a necessary but not sufficient criterion for getting the 10% of the class points based on class participation.

We will have ten assignments over the course of the semester. Some assignments will involve pencil and paper while others will involve using statistical software. For the latter assignments, you will be using StataTM, which you will be introduced to in the five lab sessions during the semester. (If you have previous experience with SASTM, S-PlusTM, or R, and would prefer to use one of these latter packages, please see me.) Each assignment will count for 3% of your overall course grade. Each assignment will be due at the beginning of class a week from when it is assigned. No credit will be given for late assignments.

Students will also take a midterm and a final exam. These exams will involve both conceptual

questions and questions requiring computations. We will be discussing both the midterm and final exams in more detail in class. The midterm exam and the final exam are, as noted above, each worth 30% of your overall course grade.

Course Schedule

Week 1 (August 25th): Course Introduction

No readings assigned.

Week 2 (August 28th — September 1st): The Nature of Statistics

Wonnacott and Wonnacott (W & W), Chapter 1

Abelson (AB), Chapter 1

Wednesday, August 30th — Lab Session (003 Gambrell) on an Introduction to Stata™

Friday, September 1st — *No Class (American Political Science Association Meeting)*

Week 3 (September 4th — September 8th): Univariate and Descriptive Statistics

W & W, Ch. 2

AB, Ch. 8

Monday, September 4th — *No Class (Labor Day)*

Week 4 (September 11th — 15th) Univariate and Descriptives Statistics and Probability 1

W & W, Ch. 3

Monday, September 11th — Lab Session on Univariate and Descriptive Statistics

Week 5 (September 18th — 22nd) Probability 2

W & W, Ch. 3

Week 6 (September 25th — 29th) Probability Distributions

W & W Ch. 4

AB, pp. 17-26

Week 7 (October 2nd — 6th) Two Random Variables and Midterm Exam

W & W, Ch. 5

FRIDAY, OCTOBER 6TH — MIDTERM EXAM

Week 8 (October 9th — 13th) Sampling 1

W & W, Ch. 6

Week 9 (October 16th — 20th) Sampling 2

W & W, Ch. 6

AB, pp. 26-42

Wednesday, October 18th — Lab Session on Sampling

Friday, October 20th — *No Class (Fall Break)*

Week 10 (October 23rd — 27th) Point Estimation

W & W, Ch. 7

AB, Ch. 3

Week 11 (October 30th — November 3rd) Confidence Intervals

W & W, Ch. 8

AB, pp. 52-53

Week 12 (November 6th — 10th) Hypothesis Testing 1

W & W, Ch. 9

AB, Ch. 4

Week 13 (November 13th — 17th) Hypothesis Testing 2 and Analysis of Variance

W & W, Ch. 9-10

AB, Ch. 5

Wednesday, November 15th — Lab Session on Hypothesis Testing

Week 14 (November 20th — 24th) Correlation

W & W, Ch. 15

Wednesday, November 22nd — Friday, November 24th — *No Class (Thanksgiving Break)*

Week 15 (November 27th — December 1st) Chi-Square and Bivariate Regression

W & W, Ch. 17, 11, & 12

Week 16 (December 4th — December 8th) Bivariate Regression

W & W, Ch. 11-12

Wednesday, December 6th — Lab Session on Bivariate Regression

FRIDAY, DECEMBER 15: FINAL EXAM

9:00 a.m. — 12 p.m.

353 Gambrell Hall