

## INTRODUCTION TO QUANTITATIVE METHODS

University College  
U25 323  
Spring 2013  
Tuesday 6-8:30PM (Seigle 103)

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### COURSE DESCRIPTION

This is an introduction to research methodology and quantitative analysis for social scientists. This class will introduce students to social scientific inquiry and basic statistical tools used to study politics. Students will learn to study politics with the help of measurement, descriptive analysis, correlation, graphical analysis, hypothesis testing, confidence intervals, analysis of variance, and regression analysis. The course will include classroom lectures and computer lab time to enable students to work hands-on with datasets. Basic math skills (algebra) are recommended.

### OBJECTIVES

The aims of this course are twofold. First, this course should give you the tools to read and critique quantitative political science studies. To that end, we'll spend roughly the first half of the course discussing how to generate hypotheses and design research in a way that allows you to test your hypotheses using data. Second, this course should provide you with the tools you need to understand and perform basic statistical tests. To this end, we'll learn—both by hand and with computer software—to use a number of different statistical techniques, including hypothesis testing and regression analysis to test our hypotheses. Along the way, we'll discuss why statistical literacy is becoming increasingly important and how the statistical techniques we discuss in class can help you become a more conscientious consumer of polling, news, and current political events more generally.

### COURSE MATERIALS

- 1) Phillip H. Pollock III. 2011. *The Essentials of Political Analysis*. 4<sup>th</sup> ed. CQ Press.
- 2) A series of supplementary readings will be distributed to students online.

### COURSE REQUIREMENTS

The requirements for this course involve both the completion of reading assignments, practice problems, and problem sets on your own outside of our class meetings as well as your active and informed contributions to our course discussions when we meet. While much of our class time will be spent in lecture, we'll hopefully have a good deal of discussion.

Without a doubt, the best way for you to earn a “good” grade in this course is to ask questions. Students come to this course with varied skills and interest in the design of research and (especially) statistics. The actual math that we'll do in this class won't require any skills that are harder than what you learned in middle school math, and our goal as instructors is to make this material as easy

for you to understand as possible. But, we can't do that without your help. Do your best with the readings before class, and bring any questions that you have with you when you come to class. We'll devote the first portion of every class period to discussion of any questions about the reading. If you ever have trouble with a reading, please don't hesitate to e-mail us or contact us to set up a time to meet.

**TWO MIDTERM EXAMS (35 points).** Students will take two midterm exams. The exams will assess your knowledge of material contained within the assigned readings, from lecture, and from our course discussions. The exams will consist of short answer questions, problem solving, and essay questions. The first midterm exam (and only the first midterm exam) will have both an in-class and a take home portion. The second midterm exam will not be cumulative. The format of the exams will be discussed further in class.

**ONE FINAL EXAM (25 points).** There will be a final exam. The final exam will be cumulative and will cover the entire contents of the course.

**PROBLEM SETS (30 points).** You will have problem sets due approximately every other week throughout the semester. These problem sets will require you to apply the material we have covered in class, either through short answer and essay questions for you to answer or statistical problems for you to solve. Problem sets are open book assignments, and you may work in groups on problem sets, but each student must turn in his or her own answer sheet. These problem sets provide you with a crucial chance to check your understanding of course content before exams. If you have trouble on a problem set, please ask for help.

**PARTICIPATION (10 points).** The final portion of your grade is based on your ability and willingness to contribute to our class. Everyone's experience in this course is enhanced by regular attendance and active participation; conversely, everyone's experience suffers if individuals do not participate. Remember that a sincere question often adds as much (if not more) to our understanding of the course material as an explanation of the week's readings. So, don't be afraid to speak up!

Please remember that attending class and sitting silently is not, by definition, "participation." Also, please note that we do not penalize you directly for missing class (though multiple absences will adversely affect your grade through a lower participation score).

## **EXPECTATIONS/PROCEDURES**

**RESPECT.** In this course, we are all engaged in the endeavor of building a stronger understanding of Quantitative Methodology. Everyone comes to this course with a different background in our subject (particularly the statistics portion of the course). It is important that we all treat each other with the utmost respect.

OFFICE HOURS. We understand that many of you are not on campus during normal business hours, and, as a result, we know that it might be difficult for some of you to attend regularly scheduled office hours. Please feel free to e-mail us to set up a time to meet if you have questions about course material. Additionally, whichever instructor will be teaching Tuesday's class will be in Seigle 212 from 5-6 on Tuesdays.

SOFTWARE. In the lab sessions and to complete your homework assignment you will be using the R statistical package (<http://www.r-project.org/>). This package is widely used in political science, economics, psychology, sociology, and biostatistics. R is available for every computing platform, and most importantly, is free.

LATE ASSIGNMENTS. Problem sets not submitted by the assigned due date and time are late. Late submissions will be accepted; however, they will be subject to a one-half grade (5%) per day (including weekends) late penalty. All assignments must be completed in order to pass this course. Should an unforeseen event arise and the problem set must be e-mailed to the instructor, the document attached to the student's e-mail will be the one graded.

EXTENSIONS. Extensions will be granted in only the most severe circumstances. If you foresee the need for an extension, one needs to be requested and granted at least 24 hours before the due date. No one is entitled to an extension; they will be offered only at our discretion.

ACADEMIC DISHONESTY. We take violations of the University's academic dishonesty policy very seriously. Please review the policy and let me know if you have any questions.

GRADING SCALE. The course will follow a standard grading scale:

97-100	A+	77-79	C+
93-96	A	73-76	C
90-92	A-	70-72	C-
87-89	B+	67-69	D+
83-86	B	63-66	D
80-82	B-	60-62	D-

DISABILITY. Should you have a disability that requires accommodation, please let us know as soon as possible.

## SCHEDULE

Below, you'll find a list of all class meetings, the topic we'll discuss, the reading assignment, and some questions to consider as you prepare for class and as you study for exams. You should complete the reading assignment before you come to class and bring any questions that you have with you to our class meetings. In the event that deviations from this schedule are necessary, they will be announced in class.

January 15 Introduction to Course

- Reading: None

January 22 The Definition and Measurement of Concepts (Nelson)

- Reading: Chapter 1; Inglehart (2003)

January 29 Measuring and Describing Variables (Uribe)

- Reading: Chapter 2; Munck and Verkuilen (2002)

February 5 Explanations, Hypotheses, and Comparisons (Nelson)

- Reading: Chapter 3; Fowler (2008); Mann and Wolfinger (1980)
- *Problem Set #1 Due*

February 12 Research Design and the Logic of Control (Uribe)

- Reading: Chapter 4; Gerber and Green (2001)

February 19 Exam 1

- *Problem Set #2 Due*

February 27 Making Controlled Comparisons (Nelson)

- Reading: Chapter 5; Pew Research Center. Nov. 26. 2012 "Young Voters Supported Obama Less, But May Have Mattered More."
- *Take home portion of Exam #1 Due*

March 5 Statistical Inference, Part I (Uribe)

- Reading: Chapter 6
- *Problem Set #3 Due*

March 13 SPRING BREAK

March 19 Statistical Inference, Part II (Uribe)

- Reading: Agresti and Presnell (2002); Mondak (1995)
- *Bring finished practice problems to class*

March 27      Significance Testing (Nelson)

- Reading: Chapter 7 (pp. 155-169)
- *Problem Set #4 Due*

April 2        Measures of Association (Nelson)

- Reading: Chapter 7 (pp. 169-187); Segal and Cover (1989); Holbrook (2012)
- *Bring finished practice problems to class*

April 9        EXAM #2

- *Problem Set #5 Due*

April 16      Regression Analysis (Uribe)

- Reading: Chapter 8 (pp. 187-201); Caldeira and Gibson (1992)

April 23      Regression Analysis (Uribe)

- Reading: Chapter 8 (pp. 201-211); Brambor, Clark, and Golder (2006)
- *Bring finished practice problems to class*

April 30      Review for Final Exam

- Reading: TBA
- *Problem Set #6 Due*

May 7         FINAL EXAM