

# Data Analysis in Political Science II

## Political Science 4782

Class Time: TR 9:35 – 10:55 AM  
Place: Derby Hall 0125  
Dates: 8/25/2015 – 12/9/2015

Instructor: Megan Eisenman  
Office: 2043 Derby Hall  
Office Hours: By Appointment

“We learn by doing” -Aristotle

### Course Summary and Objectives

This course builds on POL 4781 and will give students a more rigorous, mathematically-based overview of political science research methods. Our focus will be on research questions and the methods we can use to answer them. Key to understanding the “how” of research is a good grasp of basic statistics and probability theory, which we will review in the first two weeks, and model estimation, which we will cover in weeks four through ten.

The second section of the course is meant to illuminate research methods at work. We will do this through reading and discussion of political science articles that apply the methods we’ve discussed in class and through your development and presentation of an original research project to address a research question of your choosing.

The overall goal is that by the end of the course you will have learned the mathematics and assumptions that underpin social science models, allowing you to be a more critical consumer of published information both in the social sciences and in the world at large.

### Disabilities

Any student who feels s/he may need an accommodation based on the effect of a disability should contact the Office for Disability Services, located in 150 Pomerene Hall, to coordinate reasonable accommodations for documented disabilities.

### Academic Integrity

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct:

[http://studentaffairs.osu.edu/resource\\_csc.asp](http://studentaffairs.osu.edu/resource_csc.asp)

## Required Texts

Gujarati, Damodar. 4<sup>th</sup> Edition. *Basic Econometrics*. McGraw-Hill Irwin Co.

\*Achen, Christopher. Sage Manual 29. *Interpreting and Using Regression*. Sage University Papers.

(\*Available as a FREE e-book from the OSU library website)

## Grading

Assignment 1	5%
Assignment 2	5%
Assignment 3	5%
Assignment 4	5%
Exam	20%
Discussion Leader	5%
Presentation Assignments	10%
Presentation	30%
Participation	15%

Final letter grades are assigned on the typical scale, like so:

A-	90 – 92	A	93 – 100		
B-	80 – 82	B	83 – 86	B+	87 – 89
C-	70 – 72	C	73 – 76	C+	77 – 79
D	69 and below				

Details on the assignments will be posted on Carmen, but please note that **you must show your work to receive credit for the assignments.**

**Make-up policy:** all assignments, exams, etc. are due on the date, at the time, and in the format indicated on the assignment page. Exceptions will only be made in the case of illness or family emergency which have been documented to the instructor's satisfaction.

## Schedule and Due Dates

8/25/2015 Syllabus, Introductions

8/27/2015 Overview of the Course and Research Ethics

- Assignments for today:
  - Read for today's class: Pollock Chapters 3 (only through page 58) and 4 (on Carmen)
  - On the basis of the reading, create an outline of your understanding of the research process from formulating a research question to implementing a research design; be sure to include important terms and definitions

9/1/2015 Math, Probability and Statistics Basics I

- Gujarati Appendix A

9/3/2015 Math, Probability and Statistics Basics II

9/8/2015 Matrix Algebra

- Gujarati Appendix B

9/10/2015 Introduction to the R Statistical Software and ggplot2 Package

- Watch R Video (on Carmen)
- Read through ggplot2 documentation (on Carmen)

9/15/2015 Bivariate Regression and the CNLRM I

- Gujarati Chapters 1 and 2

**Assignment 1 Due**

9/17/2015 Bivariate Regression and the CNLRM II

- Gujarati Chapters 3 and 4

9/22/2015 Bivariate Regression and Hypothesis Testing I

- Gujarati Chapters 5 and 6

9/24/2015 Bivariate Regression and Hypothesis Testing II

- Achen Chapters 1 - 7

9/29/2015 Bivariate Regression and Hypothesis Testing III

**Research Question Due**

10/1/2015 Multiple Regression I

- Gujarati Chapter 7

**Assignment 2 Due**

10/6/2015 Multiple Regression II

- Gujarati Chapters 8 and 9

10/8/2015 Violations of the CNLRM Assumptions I

- Gujarati Chapters 10 and 11

10/13/2015 Violations of the CNLRM Assumptions II

- Gujarati Chapter 12

10/15/2015 –Autumn Break, No Class

10/20/2015 Models and Model Diagnostics

- Gujarati Chapter 13

**Annotated Bibliography Due**

10/22/2015 Non-Linear Models and MLE

- Gujarati Chapters 14 and 15

**Assignment 3 Due**

10/27/2015 Non-Linear Models and MLE II

- Pollock Chapter 9 (on Carmen)

10/29/2015 Non-Linear Models and MLE III

11/3/2015	Overview & Review of Statistical Modeling	<b>Assignment 4 Due</b>
11/5/2015	OLS and Logits—Class Discussion Day <ul style="list-style-type: none"> <li>• Doyle and Sambanis 2000</li> <li>• Gurses and Mason</li> </ul>	
11/10/2015	Case Studies <ul style="list-style-type: none"> <li>• Geddes (on Carmen)</li> </ul>	<b>Research Design Memo Due</b>
11/12/2015	Experiments <ul style="list-style-type: none"> <li>• Gerber and Green (on Carmen)</li> <li>• Imai (on Carmen)</li> </ul>	
11/17/2015	Experiments and Case Studies—Class Discussion Day <ul style="list-style-type: none"> <li>• Wantchekon (on Carmen)</li> <li>• Posner (on Carmen)</li> </ul>	
11/19/2015	Exam Review Day	
11/24/2015	Exam Day	<b>Exam</b>
11/26/2015	– Thanksgiving Break, No Class	
12/1/2015	Presentation Workshop Day	<b>Draft Slides Due</b>
12/3/2015	Pass back exams, answer questions	
12/8/2015	Presentations in Class	<b>Presentations</b>
12/11/2015	Final Exam Period, 8:00 – 9:45 AM	<b>Presentations</b>