

**PLSC 452: Introduction to Statistics, Applications in Political Science
Yale University**

**Fall 2016
Tuesday and Thursday, 1:00-2:15pm**

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Office location: ISPS, 115 Prospect Street, #335
Office hours: Tuesday 10-12 & by appointment

In the first part of this course, you learned about probability, data distributions, hypothesis testing, and ways of measuring the relationship between two variables.

The purpose of this second part of the class is to introduce you to the use of quantitative methods in political research. We will build on the material you learned in the past eight weeks and explore some of the most common statistical tools that political scientists use to answer empirical questions. Specifically, you will learn how to use multiple regression analysis, experiments, and other techniques to identify causal relationships and answer questions—especially questions about the political world. We will use examples from public opinion, voting behavior, international relations, comparative politics, public policy, and others.

When you complete this course, you will be...

- able to conduct and interpret multivariate regression analysis and analyze experimental data
- better prepared to understand quantitative findings reported in political science (and other) research
- able to think critically about and recognize the strengths and weaknesses of these analyses

In short, you will have statistical literacy!

Course Requirements

The reading load for this course is fairly light, but you are expected to do it. As with the first part of the course, there is no “required” text for this portion of the class. However, I strongly suggest that you get a statistics textbook (or find someone with whom you can share). The reading assignments below list the topic and where the topic can be found in the two recommended textbooks from the first part of the course: 1) *Stats: Data and Models* (SDM; De Veaux, Velleman, and Bock) and 2) *Introduction to the Practice of Statistics* (MMC; Moore, McCabe, and Craig). The chapter numbers refer to the 4th edition of SDM and the 8th edition of MMC, though you can find the material in earlier editions.

Some helpful links:

- Online (very basic) statistics book: <http://onlinestatbook.com/2/index.html>
- This website provides many useful examples of code and data interpretation as well: <http://www.ats.ucla.edu/stat/spss/examples/ara/default.htm>

Many other resources can be found online. You will find that while some peoples' notation varies, the core concepts are consistent, and some notation and explanations may resonate more than do others. That is fine!

Readings should be completed before the class period under which they are listed. Additionally, some reading assignments are to review chapters that you (may) have already read. Even if you think you understood the reading the first time, you should read it again. The combination of reading, lecture, hands-on analysis, and re-reading is the best way to get a grip on this material.

Apart from reading, your out-of-class efforts for this course will focus on hands-on data analysis. There will be three homework assignments over these five weeks. These assignments, as well as the data necessary to complete them, will be posted on the class website.

Grading Policy

Grades will be based on:

- Three homework assignments: For each of these assignments you will be asked to conduct analysis on provided data sets. Your grades will depend on whether you conduct the analysis correctly and how thoughtfully (and accurately) you interpret the results. All homework assignments will be scored from 0-100 points. Your homework score for the class will be an average of your eight homework assignments (three from this segment of the class and five from the first segment).
- Final exam: The Final Exam will be designed to gauge your understanding of the concepts covered in the first segment of the class as well as your ability to: 1) interpret multivariate regression, 2) recognize the limitations of examples of this type of analysis, and 3) think about how to best answer political questions using quantitative analysis.

Late homework. Because each class builds on material from the previous classes, it is particularly crucial that you complete your homework on time. Please submit your assignments to your TFs in the same way you did in the first half of the course. Homework handed in late will be penalized as follows:

- 0-24 hours late = 10 point penalty
- 24-48 hours late = 20 point penalty
- 48-72 hours late = 30 point penalty
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- Homework will not be accepted if it is more than 72 hours (3 days) late

If you have a question or concern about your grade on an assignment, you must contact your TF within 7 days of receiving the grade. For example, if an assignment is returned to you at the end of a Tuesday class, you have until the end of the following Tuesday class to contact your TF.

Getting Help: Office Hours and TFs

If you do not understand something that we are discussing in class, then please let me know, as you are almost certainly not alone. If no one asks for clarification, however, then there is no way for me to know when something needs to be clarified or reviewed. The material we cover in each class will build on the material from the previous classes, so if you don't understand something from one class you will not understand the material for the next class.

In summary: Do NOT wait until you have been lost for several classes to ask for help! The TFs for this section of the class are also here to help.

Final Grades

Your final grade is based on your performance in this part of the course and the first part of the course.

- Homework (8 total): 30%
- Midterm 1: 20%
- Midterm 2: 20%
- Final Exam: 30%

A:	93-100
A-:	90-92
B+:	87-89
B:	83-86
B-:	80-82
C+:	77-79
C:	73-76
C-:	70-72
D:	60-69
F:	59 or below

Laptop Policy

I recognize that many of you prefer to take notes on your laptops, but these devices can easily serve as a distraction. Laptop use is allowed only for note-taking, and I reserve the right to ban their use if they become a nuisance. This will be an all or nothing policy. If you want to continue to use your laptop, then make sure that your fellow classmates follow the rules as well.

About the Syllabus

This syllabus is a working document. I reserve the right to make changes to the assigned readings (additions or deletions) or to the order of topics we cover as I deem necessary. There will be no changes to the due dates for assignments or the grading criteria described above.

Class Outline and Reading Assignments

Class Meeting 1: 11/1 (Tuesday)

Answering Political Questions with Quantitative Data

- <http://fivethirtyeight.com/features/a-users-guide-to-fivethirtyeights-2016-general-election-forecast/>
- Read: Nate Cohn. “We Gave Four Good Pollsters the Same Raw Data. They had Four Different Results.” <http://www.nytimes.com/interactive/2016/09/20/upshot/the-error-the-polling-world-rarely-talks-about.html?action=click&contentCollection=The%20Upshot&module=RelatedCoverage®ion=Marginalia&pgtype=article>
- Read: Nate Cohn. “How One 19 Year-Old Illinois Man is Distorting National Polling Averages.” <http://www.nytimes.com/2016/10/13/upshot/how-one-19-year-old-illinois-man-is-distorting-national-polling-averages.html>

Class Meeting 2: 11/3 (Thursday)

Polls! Also, revisiting bivariate regression

- Read: Campbell, Donald T., and H. Laurence Ross. 1968. “The Connecticut Crackdown on Speeding: Time-Series Data in Quasi-Experimental Analysis.” *Law & Society Review* 3: 33-54.
- Read: Linear regression (SDM chapters 7 and 25.1-25.4; MMC chapters 2.3, 2.4, 2.6 and 10.1)

Class Meeting 3: 11/8 (Tuesday)

Multivariate Regression – Interpretation, Nominal and Dichotomous IVs

- Read: Multivariate regression (SDM chapter 28; MMC chapter 11)
- *Homework 1 Posted: Multivariate Regression and Causality*

Class Meeting 4: 11/10 (Thursday)

Multivariate Regression – Confounds

- Read: Aaron Carroll, NY Times Upshot. “Death By Medical Error. Adding Context to Scary Headlines.”

Class Meeting 5: 11/15 (Tuesday)

(Re)Considering Functional Forms

- *Homework 1 Due*
- Read: Non-linear relationships between variables (SDM chapter 9; MMC chapter 2.2)
- *Homework 2 Posted: Dichotomous/Nominal Variables and Functional Form*

Class Meeting 6: 11/17 (Thursday)

Interactions

- *Homework 2 Due*
- Read:
Interpreting Interactions in Regression
(<http://www.cscu.cornell.edu/news/statnews/stnews40.pdf>)
Interactions In Multiple Regression Models
(<http://www.jerrydallal.com/LHSP/reginter.htm>)
Testing and Interpreting Interactions in Regression – In a Nutshell, p. 1-3
(<http://www.psy.mq.edu.au/psystat/documents/interaction.pdf>)
- *Homework 3 Posted: Interaction Terms*

**** FALL BREAK ****

Class Meeting 7: 11/29 (Tuesday)

Experiments in Political Science

- Read: Experimentation in Political Science
(<http://www.nyu.edu/gsas/dept/politics/faculty/morton/ExpChapHandbook5April06.pdf>)
- Read: Alan Gerber and Donald Green: “Does Canvassing Increase Voter Turnout? A Field Experiment.” <http://www.pnas.org/content/96/19/10939.full>

Class Meeting 8: 12/1 (Thursday)

Analyzing Experimental Data

- *Homework 3 Due*
- Read: McDermott, Rose. 2002. “Experimental Methodology in Political Science.” *Political Analysis* 10: 325-342.
Falk, Armin, and James J. Heckman. 2009. “Lab Experiments are a Major Source of Knowledge in the Social Sciences.” *Science* 326: 535-538.

Class Meeting 9: 12/6 (Tuesday)

Natural Experiments

- Read: Thad Dunning. “Design-Based Inference: Beyond the Pitfalls of Regression Analysis.” In *Rethinking Social Inquiry, 2nd ed* (2010).
- Huber et al. “Using Battleground States as a Natural Experiment to Test Theories of Voting.” http://huber.research.yale.edu/materials/74_paper.pdf

Class Meeting 10: 12/8 (Thursday)

In-Class Review – No reading. Review your notes.