17.871
Political Science Laboratory
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Purpose

The purpose of this class is to introduce undergraduate political scientists to the basic quantitative tools of political science research. In particular, this class explores the key statistically-based research tools that social scientists use to frame and answer empirical questions. When you finish this subject successfully, you will be able to conduct quantitative research, be better able to read critically much of the professional literature in political science and other statistically-based fields, and have an employable skill. The most important purpose behind the political science laboratory, however, is to help you move from a passive reader of social scientific tomes to a creative producer of new insights.

Producing new knowledge, or systematically probing someone else's claims, can be a lot of fun. In order to get to the fun, there is a lot of stuff we have to consider. Consequently, this subject runs on three (roughly) parallel tracks.

Leaving on Track 1 is statistics. Statistical reasoning is the most important method of testing hypotheses in the social sciences. Therefore, the statistical introduction offered here forms the core of the subject. The approach I will take to statistics is informal and intuitive. The approach could be more formal and less intuitive, but that would leave us with less time to get on to the new knowledge part. If this subject piques your interest in statistical methods, or if you want a more rigorous treatment of the statistical topics addressed here, consider taking 17.800 (Quantitative Research Methods I) or 14.32 (Econometrics).

Leaving on Track B are research mechanics. Serious scholarship requires hard work, organization, and attention to detail. Lots of people have lots of interesting ideas about how the social world works. Some of these ideas are right, others, nuts. In the long run, the researchers who are taken the most seriously and who make the biggest contributions are the ones who get down and dirty with the data. Doing good empirical research involves knowing how libraries work, how to convince people to be interviewed by you, how to type numbers into a computer, how to write code in monster statistical packages, and how to craft a clear English-language sentence. We will therefore spend a good amount of time with the mundane tasks of learning how to use one statistical package (called *Stata*) and learning how to write papers that follow a specific style book (Turabian's *Manual for Writers of Term Papers, Theses, and Dissertations*).

Leaving on Track 3 is a project of your own making. There is an old Chinese proverb that says, "I hear and I forget; I see and I remember; I *do* and I *understand.*" It is this philosophy that drives the Institute's lab requirement, and it is the philosophy that drives this subject. You will be responsible for finding a question that interests you and applying the skills you're learning in this subject toward learning (and understanding) something new. This is the most interesting part of this subject. It can be fun, but it's also much more difficult than it first appears. Because doing original research is so hard, I enforce the prerequisite (17.869). You need to have a good understanding about what political science is and what political scientists do before taking this class. Otherwise, I can guarantee that you will be totally at sea the last half of the semester.

Subject organization

We will meet twice each week. During the first half of the semester the primary purpose of these meetings will be to review materials in two formats: lecture and discussion. The subject schedule below delineates what will happen each class meeting. **I expect you to be prepared for each class.** Preparation will involve different things, depending on what we will be doing in that meeting. During some meetings I will be presenting material from one of the textbooks. For those, you will be expected to have done the textbook reading before the class. I will pay attention to who seems prepared and who is not. If you are unprepared for a particular class meeting, come to class anyway, because I will grade down people who are regularly absent.

During the second half of the semester we will meet twice each week to talk about your research projects. You will be required to make two class presentations during this period. At the first presentation, you will be responsible for introducing the class to the problem you wish to address, how you plan to address it, and your preliminary findings. At the second presentation you will be responsible for presenting your findings. These will be brief presentations, probably no more than 15 minutes apiece. Because you will be graded on these presentations, you should practice them beforehand.

Subject requirements

1. Class attendance and presentation engagement. (15% of grade) See the comments in the first paragraph of the section on **Subject Organization.** Come to all the regularly-scheduled class meetings. Attending the oral presentations that your colleagues give about their research is *not* optional; your constructive participation in these sessions from the perspective of the audience will be a major aspect of this part of the grade. You also will provide brief written feedback on at least two other students' research projects. Finally, there will be a brief assignment about identifying and evaluating causal claims.

2. Data analysis exams and problem sets. (35% of grade) There will one (60-minute) in-class exam that covers material from the lectures, text book, and problem sets. These are intended to make sure you have been serious about mastering the most basic technical and mechanical aspects of conducting quantitative research.

3. Group project. (15% of grade) There will be a group project assigned the first month of the semester, to give you a short introduction to doing quantitative social science research. The final product of each project will be graded, with you assigned a grade that is a linear combination of your own effort and the effort of the group.

4. *Final research project.* (30% of grade) The final project is the culmination of this subject. You should start on the first day of the semester in thinking about what you want to research and getting together your data. Keep in mind that there is an old adage about estimating the amount of time it takes to gather and analyze data for an original project: Take your original estimate. Double it. Double it again. And again. You will still be wrong by a factor of two. In writing up your research project, you must organize the paper using a style book, preferably Kate Turabian's. The final write-up is due the last day of class. Do not assume that I will grant you an extension. You will also be graded on your two presentations.

Books

The following books are available for purchase at the Coop.

Christopher H. Achen. Interpreting and Using Regression. Sage Publications, 1982.

Paul M. Kellstedt and Guy D. Whitten, *The Fundamentals of Political Science Research*, 2nd edition, Cambridge University Press, 2013.

Ulrich Kohler and Frauke Kreuter. *Data Analysis Using Stata.* Stata Press, 3rd edition, 2012.

The following book is available online:

Edward Tufte. *Data Analysis for Politics and Policy.* Prentice-Hall, 1974. http://www.edwardtufte.com/tufte/dapp/

Overall structure

	Mon.			Wed.	
Feb.				Introduction and research design	**4**
	Introduction to Stata I Meet in **14-0637**	**9**		No class meeting	**11**
	Class meets Tuesday Introduction to Stata II Meet in **14-0637**	**17**		Data Resources and Library Research Meet in **14-0637**	**18**
	Descriptive statistics I	**23**		Descriptive statistics II	**25**
Mar.	Descriptive statistics III	**2**		Bivariate relationships I	**4**
	Bivariate relationships II	**9**		Bivariate relationships III	**11**
	Multivariate analysis I	**16**		Multivariate analysis II	**18**
	Spring break	**23**		**Spring break**	**25**
	Individual meetings	**30**		Sampling and inference I	**1**
Apr.	Group presentations	**6**		Sampling and inference II	**8**
	Preliminary project presentation I	**13**		Preliminary project presentation II	**15**
	Patriots' Day	**20**		Workshop	**22**
	Exam	**27**		Workshop	**29**
May	Workshop	**4**		Workshop	**6**
	Final presentations I	**11**		Final presentations II	**13**

Assignments

Topic	Date(s)	Assigned readings (suggested readings in parentheses)	Notes
Introduction	Feb. 4	None	
Introduction to Stata I	Feb. 9	Kohler & Kreuter, *Data analysis*, chs. 1–5 Handouts: "How to use the *STATA* infile and infix commands" and "How to use the STATA 'merge' command."	Do the readings before class so that you will be prepared for the hands-on Stata exercises
Introduction to Stata II	Feb. 17		**Hand out problem set 1**
Data Resources and Library Research	Feb. 18	None	Meet with MIT's social science data librarian and practice finding and downloading online data
Descriptive statistics I	Feb. 23	Freedman, et al, *Statistics*, chs. 3, 4 [Stellar] Kohler & Kreuter, *Data analysis*, chs. 6, 7 Kellstedt & Whitten, *Fundamentals*, ch. 5.7–5.12	**Hand out group projects**
Descriptive statistics II	Feb. 25		**Return problem set 1**
Descriptive statistics III	Mar. 2		**Hand out problem set 2**
Bivariate relationships I	Mar. 4	Kellstedt & Whitten, *Fundamentals*, ch. 8 Kohler & Kreuter, *Data analysis*, pp. 253–270 (Tufte, *Data analysis*, ch. 1)	
Bivariate relationships II	Mar. 9		
Bivariate relationships III	Mar.11		**Return problem set 2** **Hand out problem set 3**
Multivariate analysis I	Mar. 16	Kellstedt & Whitten, *Fundamentals*, ch. 9, 10 Kohler and Kreuter, *Data analysis*, pp. 270–270, 313–324 (Tufte, *Data analysis*, ch. 4)	
Multiple regression II	Mar. 18		**Return problem set 3**
Spring Break	Mar. 23, 25		
Individual meetings	Mar. 30		We will meet individually with you to discuss your final project **Hand out problem set 4**
Sampling and inference I	Apr. 1	Kellstedt & Whitten, *Fundamentals*, ch. 6, 7	
Presentation of group projects	Apr. 6		Each group will have 15 minutes to make a presentation. **Return problem set 4**
Sampling and inference II	Apr. 8		**Hand out problem set 5**
Preliminary presentations	Apr. 13, 15		Presentation schedule to be handed out well ahead of these dates
Patriots Day	Apr. 20		

Topic	Date(s)	Assigned readings (suggested readings in parentheses)	Notes
Research workshops	Apr. 22, 39; May 4,6		Informal sessions to talk through issues that have come up in the projects **Problem set 5 due on April 22**
Exam	Apr. 27		Exam will cover all the technical material in the class
Final presentations	May 11, 13		**Write-ups due May 14 (11:59 p.m.)**

I will occasionally supplement the readings with short articles describing studies.