17.871
Political Science Laboratory
MIT
T, R, 3-4:30*
E53-220
Spring 2006
URL:http://www.mit.edu/~17.871/
*Some class sessions end at 5:00. See schedule below.

Prof. Charles Stewart
Department of Political Science
Office: E53-473
Phone: 253-3127
e-mail: CStewart@mit.edu
URL: http://www.mit.edu/~cstewart/

NOTE: Because this subject is labor-intensive and has presentation requirements, there will be enrollment limitations in this subject. See the body of the syllabus for the priority system to be used if we have to resort to them. The prerequisite (17.869) is strictly enforced.

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 you will have a better idea about what political scientists do with their time, be better able to read critically much of the professional literature in the field, and may very well have an employable skill. The most important purpose behind the political science laboratory, however, is to help you move from being a passive reader of social scientific tomes to being 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 so that we can accomplish everything we need to get done once the semester is over.

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, you might want to consider taking 17.846 (Multivariate Political Analysis), 14.31 (Econometrics), or 6.430J (Engineering Probability and Statistics).

Leaving on Track 2 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. And 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 specific 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 C is a project of your own making. There is supposedly 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. I think this is the most interesting part of this subject. This can be fun, but it's also much more difficult than it first appears. Because doing original research is so hard, I am firmly enforcing the prerequisite (17.869). The reason is that you need to have a pretty 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 that begins on page 4 delineates what will happen each class meeting. I expect you to be prepared for each class meeting. 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 be paying attention to who seems prepared and who is not. If you are unprepared for a particular class meeting, come to class any way, because I will grade down people who are regularly absent from class.

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 and how you plan to address it. At the second presentation you will be responsible for presenting your findings. These will be brief presentations, probably no more than 10-15 minutes apiece. Because you will be graded on these presentations, you should practice them beforehand. When you present will be chosen by lottery.

Subject requirements

1. Class attendance and discussion of assigned readings. (20% of grade) See the comments in the first paragraph of the section on **Subject Organization.** Come to all the regularly-scheduled class meetings. We may hold *ad hoc* review and workshop sessions during the term, which are optional. **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.**

2. Data analysis exams. (20% of grade) There will be two short (30-minute), in-class exams, that cover material from the text book, along with a couple of take-home exercises that you will return graded. 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. (20% 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. *Write-up of the final research project.* (40% 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 must be delivered to me at the *start* of the last class meeting. Do not assume that I will grant you an extension.

Books to purchase

The following books are available for purchase at the Coop.

Jessica M. Utts and Robert F. Heckard, *Mind on Statistics, 3rd ed.*
Lawrence C. Hamilton, *Statistics with STATA 8*. Note: This book is out of print; we'll deal with this one way or the other.
Edward R. Tufte, *Visual and Statistical Thinking: Displays of Evidence for Making Decisions*
Edward R. Tufte, *The Cognitive Style of PowerPoint*

Enrollment limitation

This is a labor-intensive subject and one that is constrained by the requirement that people present their work. Experience has demonstrated that sixteen is the maximum number who can take this subject profitably at one time. Therefore, if more than sixteen attend the first class meeting, I will assign everyone who attends a priority number, ranging from 1 to *n, n* being the number of people who attend. The priority system operates in the following order:

Political science majors, seniors
Political science majors, juniors
Political science minors, seniors
Political science minors, juniors
All other seniors
All others.

I will stringently enforce the published prerequisite for this class, and I will know if you have taken the subject.

Overall structure of subject

Here is the overall structure of the subject for this semester, organized by date. The reading assignments will follow in the next section.

	Mon.	Tue.		Wed.	Thu.		Fri.
Feb.		Introduction	**7**		•Designing Research •Measurement •**Hand out group projects**	**9**	
		Data Resources	**14**		Introduction to Stata **Hand out graded exercise 1**	**16**	
		Monday classes	**21**		**Return graded exercise 1** Describing data	**23**	
		Describing bivariate relationships (correlation and bivariate regression)	**28**		Describing bivariate relationships (continued)	**30**	
Mar.		**Quiz 1** Multiple regression	**7**		Multiple regression (continued) **Hand out graded exercise 2**	**9**	
		Presentation of group projects	**14**		**Meet individually to talk about final projects**	**16**	
		Multivariate (continued)	**21**		**Returned graded exercise 2** Sampling & inference	**23**	
		Spring break	**28**		**Spring break**	**30**	
Apr.		Sampling & inference	**4**		**Quiz 2** Individual presentations I*	**6**	
		Individual presentations I*	**11**		Individual presentations I*	**13**	
		Patriots Day	**18**		Workshop	**20**	
		Workshop	**25**		Workshop	**27**	
May		Workshop	**2**		Workshop	**4**	
		Workshop	**9**		Individual presentations II*	**11**	
		Individual presentations II*	**16**		Individual presentations II*	**18**	

*Plan on these classes running until 5:00 p.m.

Assignments

Topic	Date(s)	Assigned readings	Notes
Introduction: Approaches to political analysis	Feb. 7	None	In addition to reviewing the assignments for the subject, I will provide an overview to political analysis. **Hand out small assignment to start class Feb. 9.**
Designing research & measurement	Feb. 9	Campbell & Stanley, *Experimental and Quasi-experimental designs for research*, pp. 6–34 (review from 17.869) Utts & Heckard, chap. 4.	**Hand out group projects**
Data Resources	Feb. 14		
Introduction to Stata	Feb. 16	Hamilton, *Statistics with STATA,* chaps. 1–2 Handouts: "How to use the *STATA* infile and infix commands" and "How to use the *STATA* 'merge' command." Svend Juul, "Introduction to STATA"http://www.folkesundhed.au.dk/uddannelse/software/stata8.pdf (link on subject web page)	Do the readings before class. I will do some lecturing, but I will also take advantage of the in-class workstations and do some hands-on exercises, too. **Hand out graded exercise 1**
	Feb. 21		Monday classes; no 17.871 class meeting
Descriptive univariate statistics	Feb. 23	Utts and Heckard, chap. 2 Hamilton, *Statistics with STATA,* pp. 65–72, 90–101. Tufte, *Visual and Statistical Thinking*	**Collect graded exercise 1**
Correlation and bivariate regression	Feb. 28 & 30	Utts and Heckard, chaps. 5 & 6 Hamilton, *Statistics with STATA* pp. 73–89, 159–185, 215–229.	
Multiple regression	Mar. 7	Utts and Heckard, supplemental topic 3	**Quiz 1 at beginning of class**
	Mar. 9		**Hand out graded exercise 2**
Group presentations	Mar. 14	Utts and Heckard, chap. 9	Read this chapter to get ahead
Meet individually to talk about individual projects	Mar. 16		I will meet individually with you to discuss your final project. Sign-up beforehand for 15-minute slots.
Multiple regression (finish up)	Mar. 21	Utts and Heckard, chaps. 11 & 13	Read these chapters to get ahead
Sampling and inference	Mar. 23	Utts and Heckard, chaps. 14	**Collect graded exercise 2**
Spring break	Mar. 28 & 30		
Sampling and inference (continued)	Apr. 4		
Preliminary presentations	Apr. 6, 11, 13	Tufte, *The Cognitive Style of PowerPoint*	**Quiz 2 will be held at the start of class on April 6**

Topic	Date(s)	Assigned readings	Notes
Informal work sessions	Apr. 20, 25, 27; May 2, 4, 9		These sessions are for you to come and seek help or talk about your project. We may also hold brief tutorials on topics that arise in the projects
Final presentations	May 11, 16, 18		**Write-ups due May 18 @ 3pm.**