POLS 205: Political Methodology I

Fall 2022

Course meetings:

Tuesdays and Thursdays 9:00-10:50am

Location: Ellison 3814

Instructor:

Paasha Mahdavi, `paasha@ucsb.edu`

Office Hours: Thursdays 1:30-2:30pm and by appointment.

Course description and objectives

This class is the first course in a three-course quantitative methods sequence for political science graduate students. Our broader goal throughout the sequence is to understand how to use empirical analysis to make evidence-based claims on political science issues. Our focus in this class is on quantitative reasoning and applied probability. Topics we will cover include introductory causal inference, descriptive statistics, sampling, conditional probability, hypothesis testing, and a foray into ordinary least squares regression. Throughout the quarter we will apply these topics and tools to real political science problems both in class and in take-home assignments.

By the end of the quarter you will be able to . . .

1. Understand how to construct data-based arguments for questions in political science;

2. Interpret data and results from statistical analysis;

3. Identify potential challenges in drawing conclusions from statistical findings;

4. Use `R` to conduct basic programming tasks and data analysis.

Prerequisites

This course is intended for doctoral students in political science, but exceptions can be made for graduate students from other departments at UCSB. Familiarity with substantive concepts in political science, policy, economics, and political economy is highly desirable but not required.

Grading and course requirements

1. Problem sets: 50%

2. Midterm exam: 20%

3. Final exam: 30%

Required Books

- Ethan Bueno de Mesquita and Anthony Fowler. 2022. *Thinking Clearly with Data.* Princeton University Press.

- Garrett Grolemund and Hadley Wickham. 2017. *R for Data Science: Import, Tidy, Transform, Visualize, and Model Data.* O'Reilly Media.
    * Freely available at `https://r4ds.had.co.nz/`

- Hadley Wickham. 2019. *Advanced R.* Chapman & Hall/CRC Press. 2nd edition.
    * Freely available at `https://adv-r.hadley.nz/`

Suggested Books

- Michael A. Bailey. 2015. *Real Stats: Using Econometrics for Political Science and Public Policy.* Oxford University Press. 1st or 2nd edition.

- Damodar N. Gujarati. 2005. *Essentials of Econometrics.* 3rd Edition. Boston: Irwin/McGrawHill.

- Andrew Gelman and Jennifer Hill. 2007. *Data Analysis Using Regression and Multilevel/Hierarchical Models.* Cambridge University Press.

- Jeffrey M. Wooldridge. *Introduction to Econometrics: A Modern Approach.* Cengage Learning. 5th edition.

- Gary King, Robert O. Keohane, and Sidney Verba. 1994. *Designing Social Inquiry.* Princeton University Press.

- Stephen L. Morgan and Christopher Winship. *Counterfactuals and Causal Inference: Methods and Principles for Social Research.* Cambridge University Press. 8th edition.

- Neil Weiss. *Introductory Statistics.* Pearson. 9th edition.

- Joshua D. Angrist and Jörn-Steffen Pischke. 2008. *Mostly Harmless Econometrics: An Empiricist's Companion.* Princeton University Press.

- Kosuke Imai. 2017. *A First Course in Quantitative Social Science.* Princeton University Press.

- Jane Miller. *The Chicago Guide to Writing about Multivariate Analysis.* 2nd edition.

Course Webpage

Additional readings for the course are papers and book chapters which can be downloaded from the course webpage on GauchoSpace. I will post lecture handouts and in-class R applications on the course webpage prior to each course topic.

Problem Sets

Problem sets will be posted on the course webpage at least one week before they are due. I will also post any data for problem sets on the course webpage. There will be five problem sets throughout the quarter. They will be graded as complete / partial / incomplete. To earn full credit, you must show compelling evidence of effort to solve each problem thoroughly.

These assignments are perhaps the most important part of the course – statistics is a subject that absolutely requires learning by doing! Start working on problem sets as soon as they are posted. You can work in groups but each person must submit their problem sets individually. Note that group study can be an excellent way to learn statistics, but you must put in proper effort to fully grasp the material; simply showing up to a group study session without having reviewed and worked through the problem set is a recipe for failure. After problem sets are turned in, we will review selected answers to problem sets during class.

Code Review

Each class session will be split between lecture and code review. At first we will start with basic code for learning the software and then we will move on to learning and practicing commands for data analysis.

We will be using R, which is an open-source (free) statistical package. This program requires writing code. RStudio is a very useful tool that makes coding in R easier. We will be using R Markdown in RStudio. You can download R from the web here: `http://cran.r-project.org/` and you can download RStudio from the web here: `https://www.rstudio.com/`. Here's a helpful website to get you started with R: `https://www.codecademy.com/learn/learn-r`.

Midterm and Final Exams

The midterm and final will each be structured as a 24-hour take-home exam involving a mix of conceptual questions and coding exercises. The midterm will be held during Week 5 and the final will be held during Week 11 (finals week).

Course Plan

*Tentative; subject to change as the quarter develops. Most of the required readings are from Thinking Clearly with Data (**TCwD**), and all pages within each chapter are to be read unless indicated otherwise.*

Week #	Topic	Readings	Deliverables
INTRODUCTION			
0	Research in Political Science	TCwD 1; King (2022)	
CAUSALITY			
1	Correlation	TCwD 2	**Problem set 1**
2	Causation	TCwD 3	**Problem set 2**
DESCRIPTIVE STATISTICS			
3	Expectations & Variance	TCwD 4	**Problem set 3**
4	Regression Logic	TCwD 5	
SAMPLING & INFERENCE			
5	Sampling	Lundberg et al. (2021), TCwD 6: 94–103	**Midterm exam**
6-7	Hypothesis Testing	TCwD 6: 103–110	**Problem set 4**
PERILS & FALLACIES			
8	Misinterpretation, p-hacking, and external (in)validity	Schrodt (2014); TCwD 7	**Problem set 5**
CONDITIONAL PROBABILITY			
9	Bayes Rule	TCwD 15	
10	Potential Outcomes	TCwD 9	
CONCLUSION			
10/11	Course Review		**Final exam**