

QUANTITATIVE POLITICAL SCIENCE¹

This draft: April 8, 2019 (Check Sakai for the latest)

Poli281, Spring 2019

Meeting time: Tuesdays and Thursdays, 2:00 - 3:15

Professor Timothy Ryan; tjr@email.unc.edu; 919-962-0403

Office hours: Wednesdays 1-4pm, provided UNC has classes (and by appointment)

Office: 307 Hamilton Hall

Classroom: Dey 206

Final Exam: Monday, May 6 at noon.

The Information Revolution has dramatically expanded the volume of information we have about the world around us. Social scientific analytical skills are transforming many sectors—business, journalism, law, public policy, health care, and finance, to name but a few—and are more valued now than ever. The broad learning objective for this course is to help students develop the tools they need to be active participants and leaders in data-driven sectors. More specifically, the learning objectives are:

1. To increase students' comfort and facility managing data in the R statistical language, with an emphasis on versatile tools such as loops, sampling functions, merging datasets, and the GGPlot data visualization software;
2. To teach basic principles of data description, including standard descriptive plots and statistics; and
3. To develop students' ability to use data to answer important social scientific questions.

Students will leave this class with the competencies they need to conduct basic analysis of many different forms of data, as well as the foundation they need to acquire more advanced skills (such as characterizing uncertainty in data and testing formal hypotheses).

The target audience for this course is undergraduate students with interest in the social sciences (not only Political Science), who want to use quantitative approaches to solve important problems and develop marketable analytical skills. This course is a prerequisite for *Poli381: Data in Politics II: Frontiers and Applications*.

This course fulfills the Quantitative Intensive (QI) requirement in UNC's Making Connections curriculum. It also fulfills counts as a course in research methods (required for completing the Political Science Bachelor's degree).

Requirements and Evaluation

Course assessment is broken down as follows.

Two Exams (25%) There will be an exam on each of the dates noted in the schedule below. The first exam is worth 10% of the final grade, and the second is worth 15%.

ASSIGNMENTS (35%) There will be six assignments due as noted in the schedule below. They are weighted equally. Assignments are due at 6pm on the days indicated.

¹ Starting in the Fall of 2019, Poli281 will be renamed "Data in Politics I: An Introduction."

FINAL PROJECT (25%, broken up as follows) The class has a capstone final project for which students, working in groups, conduct and present an original data analysis on an existing dataset. This project consists of a paper (20%) and a presentation (5%). A separate document specifies final project requirements more completely.

PARTICIPATION (15%) Your participation grade has two components. The first component is preparation for (and actual attendance in) class. At each class meeting, you will give yourself 0 to 3 points, depending on how prepared you are for class and how much you intend to participate. (0 = absent from class; 1 = attended class but did not do reading; 2 = attended class but reading was partial or rushed; 3 = attended class, completed reading with care, *and commit to being proactive in asking questions and contributing to discussion.*) The semester-long score generated by these reports is advisory to the instructor-assigned participation grade—I can and do adjust self-reports that are inconsistent with what I see in class—but I take them seriously.

The second component is participation in our class’s online [Piazza discussion forum](#). (I will send you a link get enrolled.) On Piazza, you can benefit your participation grade **either** by posting your own questions, or by providing thoughtful answers to other students’ questions. (The website keeps track of your activity.) These statistics, too, are advisory to the summary participation grade.

Because attendance is a course requirement (see the Undergraduate Bulletin) and critical to having a lively conversation, more than three unexcused absences can have a negative effect on your grade—potentially a drastic one—outside the scheme above. (That is, it can affect more than just your 10% participation grade.) If you have missed more than three classes, you should talk to me about what’s going on.

Course Texts

This course has one required textbook:

1. Imai, Kosuke. 2017. *Quantitative Social Science: An Introduction*. Princeton: Princeton University Press.

In addition, there are software requirements. Students must download and install R, a free statistical program available at <http://cran.r-project.org/>, as well as RStudio (also free), which is available at www.rstudio.com. They also must register for Data Camp (www.datacamp.com), a resource that provides tutorial videos and interactive training modules to help learn programming skills. Data Camp is free for students enrolled in this class. (I will provide you with login information.)

Other Policies

Technology in the classroom. I usually allow the use of laptops in class—I can ask you to turn them off as circumstances require—but they must be used for class purposes only. Thus, generally, your WiFi should be turned off. For what it’s worth, most people [take better notes, remember more, and get better grades](#) when they take notes on paper rather than a computer. I have had a few hundred students at this point, and observed this correlation firsthand. If I see you using your computer for extraneous purposes—e.g. chat—you can lose one point from your course grade. (I probably won’t say anything in the moment; I’ll just email you after class to let you know it happened.)

Email. I usually respond to emails within 24 hours. However, please limit your use of email to issues that are private, or at least specific to you. For matters that are not private and where other students might want to see the response, please use Piazza (see above). Note that Piazza permits anonymous posting.

I typically will not use email to repeat information that was missed because of an absence; I'll direct you to correspond with a classmate.

Cooperation and academic integrity. In a class setting, cooperative work has both benefits and pitfalls. Peers learn a lot by explaining things to each other. But it can also be easy to stumble into a passive mindset where you're not really *assimilating* the critical concepts. To strike a balance, I will designate some activities and assignments (or parts thereof) as being Cooperative, and others as Individual. It is critical that you attend to this distinction, as completing individual work cooperatively would be a breach of academic integrity.

By its nature, this class has an extra matter we need to address. While discussion with other people is permitted and encouraged for work designated as cooperative, there is a distinction between discussing a problem and copying someone else's work. (Writing computer code is an especially tempting activity for which to copy work.) Students can discuss problem-solving strategies, clarify concepts, point out mistakes, and more—but each person must generate his or her own path to the solution. *In our class, copying and pasting another person's computer code is potentially tantamount to plagiarism. **Even for work designated as cooperative, you must write your code individually.*** Unless I have given you explicit permission for some special reason, do not do it. In particular, do not share code you have written for homework assignments electronically, as you are likely to tangle yourself in a serious academic integrity issue.

Copied code is surprisingly easy to detect (there is software designed to detect it). Be assured that if I identify a case of cheating or plagiarism, I will handle it 100% “by the book,” which means (at a minimum) that you will fail the relevant assignment and that I will refer your case to the Student Attorney General.

Students with disabilities. If you think you need an accommodation for a disability, please let me know. Some aspects of the course and its assignments may be modified to facilitate your success. I will work with the Office of Accessibility Resources and Services to determine appropriate accommodations. I will treat any information you provide as confidential. Barring unusual circumstances, I require notice of a need for accommodation within the *first two weeks* of the semester.

Grade grievances. Requests for regrades have a time window. They cannot be submitted until at least 72 hours have passed since the assignment was returned (a cool-down period), and then they will only be accepted within three weeks of an assignment being returned (a statute of limitations). To request a regrade, you must submit a written memo (two pages max) explaining what aspect of your original grade you think was in error.

Absence during exams. Generally, absences on exam days will be excused for reasons of religious observance, illness, or family emergencies. I will generally require a written request for an absence. It must come as far in advance of the absence as possible if the absence is foreseen, or as soon after as possible if it is not foreseen. Per university policy, only your academic advisor can provide an official final exam excused absence.

Syllabus changes: The instructor can make modifications to the schedule below, such as if unforeseen events (e.g. a snow day) put us behind schedule. This course is being taught in a new format for the first time, so schedule changes are especially likely. Fasten your seatbelts. I will always make the changes as small as possible, and communicate them as early as possible.

Course Schedule

January 10 – Course Introduction

- Lohr, Steve. 2009. “[For Today’s Graduate, Just One Word: Statistics.](#)”
- Vance, Ashlee. 2009. “[Data Analysts Captivated by R’s Power.](#)”

January 15: The Possibilities and Perils of Data Science

- Tolany, Bill. 2017. “[Troubling Evidence of Implicit Racial Bias in MLS Refereeing.](#)”
- Make sure you have registered for DataCamp and Piazza.

Part I: Filling Your Toolkit

January 17: The R Statistical Software: Getting Set Up

- Download and install both R and RStudio.

January 22: The R Statistical Software: Basic Tools

- DataCamp: Introduction to R, Chapters 1-3
- Optional: DataCamp: Working with the RStudio IDE (Part 1), Chapter 1. (It’s a little esoteric, but will reinforce things covered in class.)

January 24: The R Statistical Software: Basic Tools

- DataCamp: Introduction to R, Chapters 4-6

January 29: The R Statistical Software: Intermediate Tools

- DataCamp: Intermediate R, Chapter 1 (Conditionals)

January 31: The R Statistical Software: Intermediate Tools

- DataCamp: Intermediate R, Chapter 2 (Loops)
- Assignment 1 due

February 5: The R Statistical Software: Intermediate Tools

- DataCamp: Intermediate R, Chapter 3 (Functions)

Part II: Data Analysis as Problem Solving

February 7: Getting to Know Your Data

- QSS Chapter 1
- Assignment 2 due

February 12: Causality

- Bertrand & Mullainathan, pp. 991-997
- QSS, pp. 32-48

February 14: Causality

- Green et al., pp. 33-38
- QSS, pp. 48-54
- Assignment 3 due

February 19: Causality

- Card & Krueger, pp. 772-778
- QSS, pp. 54-69

February 21: Causality workshop #1

- Mosteller, entire

February 26: Workshop on Causality tools

- DataCamp: Introduction to the Tidyverse, Ch. 1-2

February 28: Data Visualization #1

- DataCamp: Introduction to the Tidyverse, Ch. 3-4

March 5: Exam #1

March 7: Data Visualization #2

- Assignment 4 due

March 19: Data Visualization #3

March 21: Measurement #1

- QSS, pp. 75-96
- Blair et al., pp. 1043 - 1047

March 26: Measurement #2

- QSS, pp. 96-111

March 28: Prediction #1

- *QSS*, pp. 123-139

April 2: Prediction #2

- *QSS*, pp. 139-148
- Assignment 5 due

April 4: Prediction #3

- *QSS*, pp. 148-161

April 9: Prediction #4

- *QSS*, pp. 161-170

April 11: Exam #2

Part III: Putting Data to Work

April 16: In-class final project workshopping

April 18: In-class final project workshopping

- Assignment 6 due

April 23: In-class final project workshopping

April 25: In-class final project workshopping (and wrap up)

May 6 at Noon: Final Presentations. (A “nontraditional format” final exam.) Final project documents are due at this time as well.

Topics recommended for fun:

Prediction #5

- *QSS*, pp. 170-181
- Eggers & Hainmueller, pp. 1-7