Syllabus for PS 3: Introduction to Empirical Analysis & Quantitative Methods
Spring 2024

Course Overview and Goals

Data is increasingly central to politics, policy, law, business, and life. No matter where your life or career takes you, you will need to rely on analyzing and interpreting data -- be it understanding how persuasive a study summarized in a news article is, making a case before a judge, deciding which voters to target in your political campaign, as a political leader trying to decide what policy best serves your constituents, or as a political scientist trying to understand how politics works. The purpose of this class is to equip you to better understand how to gather and interpret data that speaks to important questions of all kinds. Much of the course, although not all of it, will focus on applications in political science, teaching you how to pose and answer political science research questions in a rigorous way.

By the end of the class you will:

- Know how to use R, statistical programming software, to analyze a dataset and learn what it indicates.
- Be able to understand why prominent studies reached the conclusions they did based on the data they gathered -- and know how to spot the flaws in these studies and critique them.
- Develop your own original research question, collect original data to answer it, and analyze it.

A Note on Prior Preparation

This course assumes no prior preparation. I know that some students are apprehensive or anxious about taking a quantitative class. This class will go slowly and we will have a number of resources available to help you. I am confident that every student that tries hard will succeed.

The class will not rely on memorizing formulas or on much use of formal mathematics. Many of the concepts will be taught through R, statistical programming software. I will assume that all students have no prior exposure to R or to statistical programming.

Students with prior preparation or an interest in more advanced quantitative research are encouraged to take PS 88, a more advanced alternative to PS 3 that the political science department now offers. To enroll in PS 88, you must either have already taken Data 8 or simultaneously enroll in Data 8.

Class Time and Location

Time: Mondays and Wednesdays, 5-6:30 pm (the class will begin **promptly** at "Berkeley time," 5:10 pm)

Location: Dwinelle 155

You must attend class during class time, this class is **not** asynchronous. 15% of your grade is determined by assignments that will be completed **during** class time (see more details below).

Personnel

Instructor

Prof. David Broockman, dbroockman@berkeley.edu (**PLEASE EMAIL YOUR GSI FIRST WHEN POSSIBLE**)

Office Hours

An overview of all office hours for the Professor and all GSIs arranged by time is available here. You may attend any GSI's office hours.

GSIs, GSI Contact Information, and GSI Office Hours

- **Yue Lin** (email florenceyuelin@berkeley.edu):
    - Section 102: Thursdays 12-1p (VLSB 2038)
    - Section 103: Thursdays 2-3p (SOCS 185)
    - Office Hours:
        - Thursdays 1-2p (VLSB 2038)
        - Thursdays 3-4p (SOCS 185)
        - By appointment
    - Head GSI
- **Jiaqian Ni** (email jiaqian.ni@berkeley.edu):
    - Section 104: Fridays 8-9a (Dwinelle 109)
    - Section 108: Mondays 8-9a (Dwinelle 109)
    - Office Hours:
        - Mondays 9-10a (Dwinelle 109)
        - Fridays 9-10a (Dwinelle 109)
        - By appointment
- **Christian Caballero** (email christian.caballero@berkeley.edu):
    - Section 106: Fridays 2-3p (Dwinelle 242)
    - Section 109: Mondays 10-11a (Etcheverry 3105)
    - Office Hours:
        - Mondays 11a-12p (Etcheverry 3105)
        - Fridays 3-4p (Dwinelle 242)
        - By appointment
- **Junwoo Suh** (email junwoo_suh@berkeley.edu):
    - Section 110: Tues 8a-9a (Social Sciences Building 136)
    - Section 111: Tues 12-1p (VLSB 2038)
    - Office Hours:
        - Tuesdays 9-10a (Social Sciences Building 136)
        - Tuesdays 1-2p (VLSB 2038)

- ■ By appointment
- ● **Kamya Yadav** (email kamyayadav@berkeley.edu):
  - ○ Section 101: Thursdays 8-9a (Dwinelle 234)
  - ○ Section 112: Tuesdays 4-5p (Hildebrand B 56)
  - ○ Office Hours:
    - ■ Tuesdays 5-6p (Hildebrand B56)
    - ■ Thursdays 9-10a (Dwinelle 234)
    - ■ By appointment
- ● **John Salchak** (email salchak@berkeley.edu):
  - ○ Section 105: Fridays 12-1p (Hearst Field Annex B5)
  - ○ Section 107: Tuesdays 6-7p (Dwinelle 183)
  - ○ Office Hours:
    - ■ Tuesdays 7-8p (Dwinelle 183)
    - ■ Fridays 1-2p (Hearst Field Annex B5)
    - ■ By appointment

Mode of Instruction

- ● **Watch asynchronous videos before class:** Before each class session (except for the very first class), you will be assigned a short video to watch. You must watch this video before class.
- ● **Activities during class sessions.** During class sessions (Tues/Thurs 5-6:30pm), you will be assigned short assignments you will complete individually ("Day 1" of each week) and in groups (on both days of each week). These assignments will be due in class.
  - ○ DSP students with extra time accommodations will receive additional time to complete the individual in-class assignments. More information will be sent to you individually.
- ● **Discussion sections** will also be held every week. These discussion sections will give you time to ask questions and review course material.

Course Policies

Communication

This is a very large class, so I would not be able to respond to all student questions or to help you individually. Therefore, please rely on your GSIs first to answer questions about course logistics and materials.

We will use Ed Discussion as a forum for student questions. You can access it on bCourses, or at this link: https://edstem.org/us/courses/35033/discussion/.

As a general rule, if you have a question that might be of interest to others in class, your first instinct should be to post it on Ed Discussion. We will closely monitor the forum and answer questions there just as quickly as we answer questions by email.

For individual-specific questions (e.g., about grades), you should email your GSI first.

If you think your question is not appropriate for your individual GSI or for Ed Discussion, please send an email addressed to both the head GSI (TK) and the instruction (dbroockman@berkeley.edu).

Optional Textbook

There is no required textbook for this class. An optional resource is *The Fundamentals of Political Science Research* by Kellstedt and Whitten, third edition.

Grades

Your final grades will be based on the following:

- In-Class Individual Assignments: 10%
  - Your lowest individual assignment grade will be dropped.
  - The first assignment will not count towards your final grade.
- In-Class Group Assignments: 5%
  - Your lowest group assignment grade will be dropped.
  - The first week's assignments will not count towards your final grade.
- Problem Sets: 35%
- Final Project: 15%
- Midterm: 10%
- Final: 15%
- Peer Evaluations: 5%
- Section Attendance: 5%

Grading Scale

- A+: instructor discretion (approximately top 5% of class)
- A: 93-100
- A-: 90-92.99
- B+: 87-89.99
- B: 83-86.99
- B-: 80-82.99
- C+: 77-79.99
- C: 73-76.99
- C-: 70-72.99
- D+: 67-69.99
- D: 65-66.99
- F: 64.99 and below

Curve

I will not curve any grades down, but I will curve everyone's final grades upwards if necessary. In particular, I will curve the class such that:

- A+: at least 5% of the class gets an A+
- A: at least 28% of the class gets an A or above

- A-: at least 45% of the class gets an A- or above
- B+: at least 60% of the class gets a B+ or above
- B: at least 70% of the class gets a B or above
- B-: at least 80% of the class gets a B- or above
- C+: at least 90% of the class gets a C+ or above
- C: at least 93% of the class gets a C or above
- C-: at least 97% of the class gets a C- or above

(By final grade I mean your overall, final grade in the entire class, not your grade on the final exam.)

Groups

I will assign you to small groups (3-4 students). You will complete the group in-class assignments and gather the data for your group project within these same groups.

Discussion Section Attendance

You are required to attend discussion sections. You may miss one discussion section without it impacting your grade. If you miss more than one discussion section for an unexcused reason, you will lose 20% of your section participation grade for each discussion section you miss. To be clear, **you will not lose points for missing class for health-related reasons; please stay home if you are feeling sick, have been exposed and need a test, etc.**

Late Assignments

Extensions and permission to submit late work will only be granted in extenuating circumstances outlined **to your GSI** in writing **prior to the due date**. Multiple assignments from other courses scheduled for the same date – or other work commitments – do not constitute acceptable reasons for extensions, so please plan accordingly. Late assignments will be penalized by 10% per day late.

Collaboration on Problem Sets

We welcome students working together on problem sets. Collaboration benefits both the receivers of help as well as the givers: being able to explain something to others is one of the best ways to truly master it.

However:

1. You should always spend some time trying to figure out the problems on your own before turning to others. This is both to keep a check on how well you understand the material, and because the initial stages of trying to crack a problem on your own are an important way on the path to understanding.
2. <u>**You must write your own answers from scratch.**</u> For example, **do not collaborate on joint answers that you then re-write in your own words**. Copying/pasting answers from others is strictly prohibited and will be considered a violation of the academic honor code.

Note: These restrictions do not apply to group assignments (e.g., in-class group assignments). Students can fully work together for these as they will only be submitting one copy for the entire group.

Appealing Grades

If you believe your grade on an assignment does not reflect the quality of your work, you can appeal as follows:

- Wait 24 hours, but no more than 1 week, after receiving the grade.
- Email your GSI a clear and short explanation of why you believe the grade is incorrect. If necessary, they will consult me.
- We reserve the right to *lower* your grade after an appeal.

Accessibility Needs

If you have a condition that affects your ability to participate fully in class or to meet all course requirements (in addition to the usual DSP accommodations), please speak with your GSI and/or me ASAP that we can work together to make appropriate arrangements.

Additional Resources

- As a reminder, we encourage you to post questions on Ed Discussion.
- We encourage you to make use of the Data Science peer consulting service: https://dlab.berkeley.edu/training/frontdesk-info. They are open Monday - Fridays 9am - 5pm.
- We will provide an "R Cheat Sheet" that will serve as a quick reference for how to accomplish tasks in R.

Advice on Succeeding in This Course

The concepts and approaches taught in this course will be new to most of you. We know that, and we do *not* expect you to understand everything we teach the first time. However, we are confident every Berkeley student can succeed in this course. Here are some suggestions for how to do so:

- Watch the relevant course videos again and review the assignments again.
- When you get answers wrong, review the solutions and understand what you got wrong.
- **Don't wait** to start the problem sets. They are almost half of your course grade. These problem sets may take you some time.
- **Don't wait** to ask for help. The course material builds on itself, so if you are confused one week, you'll keep being confused -- e.g., Week 3 requires you to use what you learned in Week 2.

Course Schedule

The course bCourses site is the definitive source for all due dates.

The below gives an overview of what we will learn in the course by week.

- Week 1: Course Introduction
- Week 2: Intro to Jupyter Notebooks and R; Descriptive Statistics
- Week 3: Tables

- Week 4: Causality and Omitted Variable Bias
- Week 5: Randomized Experiments
- Week 6: Quantifying Uncertainty with Standard Errors and p-values
- Week 7: Confidence Intervals
- Week 8: Heterogeneous Treatment Effects; External Validity of Causal Claims
- Week 9: Polls and Random Sampling; Descriptive Hypothesis Testing
- Week 10: Scatterplots; Bivariate Regression; Correlation
- Week 11: Multivariate Regression
- Week 12: Reading Regression Tables
- Week 13: Natural Experiments
- Week 14: Applications: Collective Action Problem