PS-3: Introduction to Empirical Analysis and Quantitative Methods (Fall 2025)

Discussion Section Syllabus (102 & 110)*

GSI: Zachary Lorico Hertz

Section 102: Tues 10:00am - 11:00am

Section 102 Office Hours: Tues 11:00am - 12:00pm

Section 102 Room: SSB 151

Section 110: Wed 2:00pm - 3:00pm

Section 110 Office Hours: Wed 2:00pm - 3:00pm

Section 110 Room: Morgan 109

E-mail: zachary_hertz@berkeley.edu

Additional office hours: by appointment

Section Objectives

First and foremost, it is my wish to welcome you to the fall 2025 iteration of *PS-3: Introduction to Empirical Analysis and Quantitative Methods*! We increasingly live in a world of data, and being able to understand and synthesize this data will open an incredible number of doors. It is my hope that in section, I will give you the tools needed to gather and interpret data in a way that prepares you as you bring your political science degree into the next stage of your careers.

In particular, my goal is for this section to serve as a space to build your understanding of data analysis and encourage you to use this understanding to analyze political science questions that you find interesting. You should be able to draw on material from lecture and in-class exercises in your discussions during section, while exploring the connections between these materials in a collaborative manner. Activities to do so may include class discussions, small group discussions, short coding assignments, and additional learning activities. These activities are designed to encourage you to deeply engage with the week's concepts within the greater context of the class alongside your peers. They are a necessary and core component of the course, and as such **attendance is required for the first hour**.

Additionally, I understand that the material for this class is challenging and many of you may not have prior experience. Because of this, **I want section to help you build a support system that will help you succeed in this class**. This requires a classroom in which *everyone* feels comfortable asking questions and helping each other. To that end, I want to remind you that it is *ok* to not know everything. We are all here to learn - even me! Sustained effort and a growth mindset are key to succeeding in this course, and I have full confidence in everyone's ability to apply both.

Section is also an opportunity for you to ask questions about the material. I **strongly** encourage you to submit your questions **before section has started** so that I have sufficient time to prepare answers. Submitting questions (under your name) ahead of section will count towards your participation grade, and are also essential for me to focus section time to ensure discussion is helpful for you. I plan to structure

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*Current version: 1.0 - 28 August, 2025.

section to start by answering your pre-submitted questions, then any questions raised during section. If there are requests to recap previously-covered concepts, I will do that as well.

To restate, I know that the topics we will cover in this class are difficult and can sometimes be frustrating. I will cover more about my intent and goals in our first section, but broadly I aim to help you with three main goals: first, to help you learn and utilize the power of data, statistics, and computing in politics; second, to help you master the skills covered by this course in order to help you earn a grade you are satisfied with; third, to help you apply the skills you have learned in your current/future work.

Feedback and Evaluations

Honestly, I am incredibly excited to be your GSI! I will do my best to answer your questions and be a resource to you for this class. There are no "bad" questions.

Your feedback will be important to me to ensure I am making section most useful for you. **I want to you to enjoy learning from me and I cannot improve without your feedback!** You will receive an evaluation form around mid-semester; please do take the time to fill it out. I also welcome feedback at any point and it would be helpful to hear from you on what is working and what can be improved.

Contact Information

It is my goal as your GSI to help you with anything even remotely related to the course! I would prefer that you reserve email communication for technical and administrative questions about the course. When you have these questions, please feel free to email me (zachary_hertz@berkeley.edu). I would prefer that you bring substantive questions about course content or other questions to Ed Discussion first. Why? Odds are that for any given question, there are several other students who have the same question. By asking it on Ed, your peers can also engage with the answer to your question. If you feel you have not received an answer, please bring these questions either to section or to my office hours.

I aim to respond to every email in a timely manner, but I may miss the occasional email. If I do not respond to your email within two business days, please kindly remind me. I generally reply to emails during normal business hours (ie. not after around 6 pm, and generally not on weekends barring either extenuating circumstances or agreed-upon prior notification). If your question is urgent, please mark it as such and I will do my best to respond promptly. Likewise, please label your emails with "PS3" in the subject line (I have an email filter that bumps these emails to the top of my inbox so I can respond ASAP).

Office Hours

I will hold office hours every Tuesday from 11:00 am to 12:00 pm, and every Wednesday from 3:00 pm to 4:00 pm, after section. If you would like to meet me for personal reasons outside of office hours, please feel free to email me and I will try to make the scheduling fit.

This is not mandatory, but in the first two weeks, please do take the time to come to office hours, even if you don't have questions! I would love the opportunity to get to know you a little bit, understand your motivations for taking the course, and how I can be of most help to you.

A final note on office hours: students often let a lack of clarity on the purpose of office hours keep them from attending, so I want to clear this up. Some discussion topics you can come to me to talk about during office hours include (but are not limited to):

- You want to try something new in R but need help troubleshooting your code
- You are having trouble with a course concept and need help understanding it
- You want to write a thesis next year and wanted to ask questions about it

- You want to know what graduate school is like
- You want to practice going to office hours in a lower stakes environment

Course Policies

Course policies are outlined in the syllabus. Please refer to the syllabus for all questions related to grading, assignments, and the course schedule.

Section Rules

Failure is an important part of the learning process. As a result, I want to create a section where students feel that it is ok to fail at first, and where they will not be judged by their peers or by me. To help create a safe and inclusive classroom environment conducive to everyone learning, please be respectful and kind towards your peers and towards me. Additionally, any discriminatory language or behavior **will not** be tolerated. If you have concerns about conduct during section, please feel free to speak with me privately. I will not disclose any information you share, beyond disclosures that trigger mandatory reporting.

I do not expect that everyone will agree — politically or intellectually — throughout this class, and in fact measured, respectful disagreement is healthy and important to any discussion. You will never be penalized for political views, and I want you to feel safe expressing your views in this class. I ask that you respect the opinions of others in the class, however, and know that I will respect yours.

This class will require the use of a computer, so I do not place a blanket restriction on your use of technology in section. I do, however, ask that you keep your phones *out of sight* and refrain from using your phones unless explicitly granted permission to do so for section activities or for accessibility reasons. Why do I ask that you keep your phones out of view? Even simply seeing a notification has been found to affect student learning, and this can serve as a distraction not only to yourself but also to any nosy neighbors you might have.

Grading and Expectations

Participation

Your contributions in section are a major component of learning for both yourself and your peers. You should try to make thoughtful, engaged, and well-informed contributions in the form of either questions or comments. During our meetings, I will want to hear you articulate *what* and *how* you are thinking about the material and the issues they raise and to engage with one another while exercising active listening. Participation in section may look different for different students, but coming to section prepared and *having watched the material* is the key to valuable participation that will benefit you and your classmates. Participating in section may include:

- Posing a question about the lecture videos or suggesting an answer to somebody else's question;
- Submitting a question before section under your name
- Voicing your agreement with the GSI's or another student's comment and adding further evidence to support or expand upon their idea;
- Proposing a case study that implements the research design we are discussing;
- Theorizing on possible relationships between variables
- Drawing connections with concepts we have previously discussed;
- Questioning a concept, function, package, or idea that you don't understand;
- Coming to office hours to raise questions or troubleshoot your code.

Grading

All assignments will be graded fairly following the rubric and/or guidelines set forth by the professor. I am more than happy to discuss your assignment grades with you in office hours, but not within the first 48 hours after you receive your graded assignment. If you wish to dispute an assignment grade, you must document and explain in writing each aspect of your assignment that you feel was graded incorrectly or unfairly. Be aware that a re-grade may lower rather than raise your assignment score.

Preparation

Carefully and thoughtfully view the lecture videos of the week, prior to each section. You will need to reflect on them and work out at least some of your own thinking about them beforehand, especially because our meetings are short. This should go without saying, but **bring a laptop (or other device) so you can practice coding in class.** This is required for course participation.

Attendance

You are granted **one single unexcused absence for section**, with no questions asked. Additional absences will result in lower participation grades, barring an excused absence approved by the GSI (ie. me). Requests for excused absences **must be submitted in writing to be considered**. If you miss more than one discussion section for an unexcused reason, you will lose 20 percent of your section participation grade for each discussion section you miss.

Things come up and life happens! Contact me in advance if, for some appropriate reason (ie. illness), you must miss a section so we can discuss any assignments due and/or the possibility of attending a make-up section. Please arrive on time and do not leave early. If you must leave early, please inform me ahead of time and sit near the door to minimize the disruption for your classmates.

Academic Honesty

Collaboration on Problem Sets (from the course syllabus)

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. **You must write your own answers from scratch.** 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.

Other Notes on Academic Honesty

If you remain unsure what the bounds of proper attribution are, feel free to reach out to me, the instructor, or find clarification from other campus resources (the Office of Student Conduct, the Student Learning Center, the campus library). Remember, the consequences to academic dishonesty are severe but can be avoided by asking questions and utilizing proper attribution.

Additionally, as a part of the Berkeley campus community you are expected to abide by certain standards of integrity in your academic endeavors. Your work should provide you with the opportunity to be evaluated on your own merits, and represent fully and honestly the strength of your original ideas. We will assume that any assignment you submit under your name meets these criteria of proper attribution, and expect your work to meet the basic tenets of academic honesty.

Policy on Artificial Intelligence

You are strictly forbidden from using generative AI (a catch-all term including but not limited to ChatGPT, Claude, Gemini and similar LLMs) to produce work submitted under your name in such a way that would constitute plagiarism if the generative AI were any other author. Furthermore, its use on exams is strictly prohibited in this course.

Permissible uses of generative AI are those that act similar to search engines such as Google (ie. to ask about potential sources) and to assess potential spelling/grammar errors. Note, however, that while generative AI is decent at the latter task, the former remains plagued by hallucination and potential errors will be penalized. Furthermore, generative AI **may not** be used to directly compose any part of submitted assignments. To rephrase, you **may not** directly copy and paste — nor recreate verbatim without attribution — the output of a Large Language Model.

In general, I **strongly** encourage students to refrain using generative AI for any purpose throughout this course, even in potentially permissible ways. Remember that this course aims to help you build the skills necessary to code in a new language and critically think about data; while it may be uncomfortable at times, engaging directly in this process without the aid of generative AI will ultimately make you a stronger and more capable person, and this class will reward the effort you put in. **It is critical to understand the fundamentals of the language *before* you begin to use AI**, and while of course we understand you may use LLMs to code in the future, this course aims to help you build the basic skills necessary to understand and troubleshoot even AI-generated code. To demonstrate to me that you've read this syllabus and understood it (including this section) please email me with PS3 in the subject line, telling me if you have a favorite comfort food; doing this will earn you a small bonus in your grade.

As a general rule of thumb: if you are unsure if the use of generative AI is appropriate or not, do not use it.

Tentative Section Schedule

- **Week 1**: No section
- **Week 2**: Intro to Jupyter Notebooks, R, and R Studio; 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, Midterm Review
- **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 and Final Exam Review

Other Resources

Technology Access Issues

If you encounter an issue accessing technology at any point in the semester (or, indeed, throughout your time at Berkeley) consider the following resources:

- Student Technology Equity Program: free long-term loans of laptops, headphones, and other hardware devices
- Cost of Attendance Adjustment: loan (sometimes grant) of $3000 to purchase a computer every 3 years through the financial aid office
- Student Helpdesk: free drop-in tech support (wi-fi issues, broken laptop, etc.) located in Doe Library, Eshleman Hall, and Fannie Lou Hamer Resource Center, and via email (sts-help@berkeley.edu) and phone (510-642-HELP)
- Free Software: Visit software.berkeley.edu and click "What am I eligible for?" to find over a dozen free software downloads.

Diversity and Classroom Climate

Diversity is a defining feature of the University of California and we embrace it as a source of strength. Our differences — of race, ethnicity, religion, sexual orientation, gender identity, age, socioeconomic status, abilities, experience, and more — enhance our ability to achieve the University's core missions of public service, teaching, and research. We welcome faculty, staff, and students from all backgrounds and want everyone at UC Berkeley to feel respected and valued.

We are all responsible for creating a learning environment that is welcoming, inclusive, equitable, and respectful. If you feel that these expectations are not being met, you can consult me or David Broockman. The expectation in this class is that we all live up to this responsibility, even during vigorous debate or disagreement. The resources listed below may help individual students feel a sense of belonging.

As UC employees, all course instructors, GSIs, and tutors are "Responsible Employees" and are required to report incidents of sexual violence, sexual harassment or other conduct prohibited by university policy to the Title IX officer. We cannot keep reports of sexual harassment or sexual violence confidential, but the Title IX officer will consider requests for confidentiality. There are confidential resources available to you through UCB's PATH to Care Center, which serves survivors of sexual violence and sexual harassment.

Sexual Harassment and Violence

Visit the PATH to Care website: http://sa.berkeley.edu/dean/confidential-care-advocate or call the PATH to Care 24/7 Care Line: 510-643-2005.

Students with Disabilities

If you need disability-related accommodations in this class, or if you have emergency medical information you wish to share, please inform me immediately, either in private after class or during office hours. For more information, visit the website of the Disabled Students' Program at http://dsp.berkeley.edu/ or contact DSP by phone at (510) 642-0518 (voice), (510) 642-6376 (TTY), or email dsp@berkeley.edu.

Student Learning Center

Located in the Cesar Chavez Student Center, Lower Sproul Plaza. Visit http://slc.berkeley.edu/general/ for more information. The Student Learning Center provides a variety of services to assist students with coursework and assignments, including study groups, writing consultations, and workshops.

Counseling and Psychological Services

The Tang Center, 2222 Bancroft Way, offers counseling and psychological services for students facing various challenges, such as adjusting to school, deciding on a major, dealing with personal crises, and more. Visit https://uhs.berkeley.edu/caps for more information.

Undocumented Students Program (USP)

Located at 119 Cesar Chavez Center, USP provides holistic, multicultural, and solution-focused services to undocumented students. Visit https://undocu.berkeley.edu/ for more information.

Basic Needs Center

The Basic Needs Center, located at the lower level of MLK Student Union (BNorth), Suite 72, provides support with essential resources like food, housing, healthcare, and more. Visit https://basicneeds.berkeley.edu/home for more information.

Educational Opportunity Program (EOP)

EOP at Cal supports first-generation and low-income college students with guidance and resources necessary to succeed. Visit http://eop.berkeley.edu for more details.

Gender Equity Resource Center (GenEq)

Located at 202 Cesar Chavez Student Center, GenEq fosters an inclusive experience for all students and provides resources related to gender and sexuality. Visit https://cejce.berkeley.edu/geneq for more information.

Multicultural Education Program (MEP)

MEP works towards institutional change and a positive campus climate for diversity. Visit https://mep.berkeley.edu/ for more details.

Ombudsperson for Students

Located at 102 Sproul Hall, the Ombudsperson provides a confidential service for students involved in University-related problems. Visit http://sa.berkeley.edu/ombuds for more information.

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