# Introduction to Empirical Analysis and Quantitative Methods

# PS 3

*Four (4) semester credits*

**Fall 2024**
**M/W 5-6:30pm, Zoom lectures**
Version 8/21/2024

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Office Hours: Tues 12:30-1:30 (Zoom), Thurs 3-4 732 SSB
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This course provides an overview of some of the methods employed in political science research. Its purpose is to familiarize you with the scientific study of politics, and to teach you how to pose and answer empirical research questions using appropriate evidence and arguments. Along the way we will learn about how to formulate and evaluate theories, how to design research to discover whether a particular theory holds up empirically, and some basic research strategies. By the end of the course, you should have the tools to critically evaluate the kinds of social science arguments found in everyday life.

After successfully completing this course, you will be able to:

- Distinguish among different types of social science methodologies
- Understand deductive approaches to theory building
- Solve basic 2x2 games
- Describe the logic of the experimental method
- Interpret basic descriptive statistical results
- Formulate and test hypotheses
- Explain and apply bivariate OLS regression

## Graduate Student Instructors (GSIs)

While the instructor will interact with the whole class and will oversee all activities and grading, as well as being available to resolve any issues that may arise, the GSIs will be your main point of contact. Your GSIs are responsible for assisting you directly with your questions about assignments and course requirements.

## GSI Office Hours

The GSIs will offer weekly office hours. While these office hours are optional, they can be valuable for discussion, answering questions, and reviewing for exams. Exact times and locations will be announced.

## Course Mail

Make sure to check the Course Mail for messages from the instructor. You can access course email within the Learning Management System by clicking on the Inbox link or choose to have your course mail forwarded to your personal email account or your cell phone.

## Question & Answer Forum

Each module will include a question and answer forum. Please use this forum to post questions about the course material, assignments, the learning management system or homework ***before*** you contact me or your GSI. The instructor/GSIs will monitor this forum**,** but we encourage you to post answers to help other students. This helps to create a general FAQ so that all students in the course may benefit from the exchange. **You can receive up to a 5% bonus for constructive answers to questions posed in this forum. How much extra credit you receive is at my and the GSIs discretion.**

## Required Materials

- Paul M. Kellstedt and Guy D. Whitten, The Fundamentals of Political Science Research. Third Edition. Cambridge: Cambridge University Press, 2018. (Note: The first and second editions of this book are floating around. I cannot say how the third edition differs from the first two. However, the lectures, assignments, and exams assume the third edition.)
- Other readings for this course will be available on bCourses.

## Technical Support

If you are having technical difficulties with bCourses or Gradescope, please alert your GSI immediately. However, understand that neither the GSIs nor the professor can assist you with technical problems. You must call or email tech support and make sure you resolve any issues as soon as possible.

**After the first week extensions and late submissions will not be accepted due to "technical difficulties" unless the fault lies with our error.**

## Sections

Each of you has been assigned a section. For some of you your assignments and exams may be graded by a different GSI. We will inform you who that is soon. Section dates and times are below:

| Sect # | Time | Location | GSI | Email |
|---|---|---|---|---|
| 101 | Th 10-12 | 155 SSB | Sharik Laliwala | sharik@ |
| 102 | Th 12-2 | 155 SSB | Daniel Quiroga-Angel | daniel.qa@ |
| 103 | Th 2-4 | 151 SSB | Sharik Laliwala | sharik@ |
| 104 | Th 4-6 | 151 SSB | Daniel Quiroga-Angel | daniel.qa@ |
| 105 | F 10-12 | 151 SSB | Juan Campos | juan_campos@ |
| 107 | F 2-4 | 136 SSB | Juan Campos | juan_campos@ |
| 108 | F 4-6 | 109 Dwinelle | Igor Kolesnikov | igor_kolesnikov@ |
| 109 | Th 8-10 | 155 SSB | Igor Kolesnikov | igor_kolesnikov@ |
| 110 | Th 6-8pm | 109 Dwinelle | Elijah Mercer | elijahmercer1@ |
| 112 | F 6-8pm | 109 Dwinelle | Elijah Mercer | elijahmercer1@ |

## Multimedia Lectures

I will generally lecture twice a week except on exam weeks, but there are also some recorded lectures to support your readings and assignments. These are listed as "Digital Media" in the syllabus. Please note that the live lectures will usually contain more material

than the recorded lectures, even if they cover similar material.

## Homework - 10%

There will be nine homework assignments and one ungraded self-assessment quiz that put the lessons into practice. Some questions will assess basic conceptual understanding, and require short essay-type responses (typically no more than a page). Others will assess how well you can apply the techniques we learn, and require solving problems. To achieve full credit on these problems you will need to both have the correct answer and show the steps you took to reach it. There may also be multiple choice questions in which you will not need to show how you got your answer. Assignments are generally due by late Friday of the week in which we cover the material. You will need to submit your homework electronically (as a PDF) through Gradescope.

## Participation - 15%

Your participation grade depends on section attendance and participation. Your GSI will fill you in on the details.

## In-Class Midterms - 75%

There will be three closed book in-class midterms, to be held Oct 2 (20% of your grade), Nov 6 (25% of your grade), and Dec 20 (3-4:30pm, 30% of your grade). The exams will consist of problems that are designed to assess your understanding of core concepts and ability to solve problems and interpret your solutions.

## Extra Credit - 5%

Up to 5% extra credit will be given for constructive answers to the questions your classmates pose in the weekly question and answer forum.

The course grade will thus be determined based on the following formula:

| | |
|---|---|
| Participation (Section) | 15% |
| Midterms | 75% |
| Homework | 10% |
| | |
| Extra Credit | 5% |

## Late Work Policy

Late work will be penalized 10% per late day or portion thereof, and will not be graded if turned in more than two days late. Extensions will not be granted without proof of a legitimate medical or personal reason.

## Promptness

Homework assignments all have specific due dates and times. You will not receive full credit if assignments are submitted after the indicated deadline. Students who wait until the final hours prior to a submission deadline risk having problems with their internet, hardware, software, or various other site access difficulties. Therefore, it is advisable not to wait until the last minute.

## Honor Code

The student community at UC Berkeley has adopted the following Honor Code: "As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others." The expectation is that you will adhere to this code.

## Collaboration and Independence

Reviewing lecture and reading materials, collaborating on homework, and studying for exams can be enjoyable and enriching things to do with fellow students. This is recommended. However, all exams will be in class and closed book, without collaboration.

## Cheating

A good lifetime strategy is always to act in such a way that no one would ever imagine that you would even consider cheating. Anyone caught cheating will be reported to the University Center for Student Conduct. Pending the outcome of that process, you could fail the course.

To copy text or ideas from another source without appropriate

reference is plagiarism and will result in a failing grade for your assignment and usually further disciplinary action. This includes the use of AI applications such as ChatGPT, Gemini, Grok, and others.

## Grading Policy

Although my default grade rubric are the traditional 90%/80%/70% cutoffs for A's, B's, and C's, I regularly depart from that rubric with material that students find more challenging. The rubric will *never* be tougher than the traditional rubric, so it is possible for everyone to get A's but not possible for no one to get an A.

bCourses keeps meticulous track of point totals across homework and has its own default rubric for assigning letter grades. **IGNORE THE LETTER GRADES YOU SEE ON bCOURSES UNLESS YOU HEAR OTHERWISE FROM ME.**

The way I compute your final letter grade is as follows:

1. Each individual assignment is given a letter grade as we proceed through the course. So each homework and exam will have letter grades, and at the end of the course you will also have a participation letter grade.
2. I convert those letter grades into standardized percentages.
3. I compute a weighted average of those percentages according to the weights described above for different components of the course. This yields a percentage for the whole course.
4. I add in any extra credit
5. I add an additional 1% so that students just below the threshold for a higher grade are not penalized given the subjectivity involved in grading decisions.
6. I convert this final percentage back into a letter grade for the course.

## Incomplete Course Grade

Students who have substantially completed the course but for serious extenuating circumstances, are unable to complete the final exam, may request an Incomplete grade. This request must be submitted in writing or by email to the GSI and course instructor. You must provide verifiable documentation for the seriousness of the extenuating circumstances. According to University policy, Incomplete grades must be made up within the first three weeks of the next semester, though the instructor will consider exceptions.

## Students with Disability

If you require course accommodations due to a physical, emotional, or learning disability contact the UC Berkeley's Disabled Students' Program (DSP). DSP will inform us of your accommodation. We cannot offer accommodations unless it is approved by DSP.

## Some Course Rules

- I do not hand out study sheets before exams. Part of mastering the material is learning to distinguish between important themes and incidental facts, a process your GSIs and I are happy to assist you with. Of course we will have review sessions and are open to all questions.
- Please report any suspected errors in the grading of an assignment within two days of receiving the grade. I reserve the right not to effect a grade change if an issue is reported after two days have passed.
- Syllabi are wonderful documents with lots of information on the time and place of office hours, the dates of exams, and course requirements. Please do not ask for information contained in the syllabus.
- Unless otherwise specified no appointment is necessary to come to my office hours. Just come!

## Week 1, Aug 28: Course logistics

## Week 2, Sept 2: No class (Labor Day)

## Week 2-3, Sept 4,9: Studying Politics Scientifically

**Digital Media:**

- What is a scientific approach?
- Generating scientific knowledge
- Inductive theory building

**Readings:**

- Kellstedt and Whitten, Chapter 1.
- John H. Kranzler, Statistics for the Terrified. Third Edition. Prentice Hall, 2003, pp. 8-16.
- George Will, "Democracy in Iraq Isn't So Far-Fetched", The NJ Press of Atlantic City, September 8, 2003.

**Assignments:**

- Homework W2 due Sept 13.

## Week 3-4, Sept 11,16,18: Deductive Theory Building

## Introduction and Illustrations (Sept 11,16)

**Digital Media:**

- Deductive theory building
- Illustrations: 2 and 3 party systems
- Implications for voting systems and legislative decision-making

**Readings:**

- Kellstedt and Whitten, Chapter 2, sections 2.1 through 2.5.
- Gary King, Robert O. Keohane, and Sidney Verba, Designing Social Inquiry. Princeton: Princeton University Press, 1994, pp. 14-19.
- Earl Babbie, The Practice of Social Research. Eleventh Edition. Thomson-Wadsworth, 2007, pp. 49-55.
- Kenneth A. Shepsle and Mark S. Bonchek, Analyzing Politics. New York and London: W. W. Norton, 1997, pp. 49-53, 57-62.

## Spatial Voting (Sept 18)

**Digital Media:**

- Downsian assumptions and mechanism
- Interpreting the result
- How well does the model explain party politics?

**Readings:**

- Kellstedt and Whitten, Chapter 2, sections 2.6 through 2.8.
- Anthony Downs, An Economic Theory of Democracy. New Haven: Yale University Press, pp. 3-14; 21-35.
- Donald Green and Ian Shapiro, Pathologies of Rational Choice. New Haven: Yale University Press, 1994, pp. 151-153.
- Kenneth A. Shepsle and Mark S. Bonchek, Analyzing Politics. New York and London: W. W. Norton, 1997, pp. 140-144.

**Assignments:**

- Homework W3-4 due Sept 20

## Week 5, Sept 23,25: Game Theory

**Digital Media:**

- Basic concepts
- Prisoners dilemma game
- Examples: Arms races, cartel behavior
- Assurance game
- Chicken game

**Readings:**

- Avinash Dixit and Susan Skeath, Games of Strategy. New York and London: W.W. Norton, 1999, pp. 1-22, 24-32, 79-87, 97-99, 107-112.
- Kenneth A. Shepsle, Analyzing Politics. New York and London: W. W. Norton, 2010, pp. 159-163; 231-241; 245-251.

**Assignments:**

- Homework W5 due Sept 27.

## Week 6, Sept 30: Midterm Review
## Week 6, Oct 2: First Midterm

## Week 7, Oct 7,9: Causality

**Digital Media:**

- Thinking about causality
- Rules for constructing causal theories
- Hurdles to cross for a causal relationship
- Examples

**Readings:**

- Kellstedt and Whitten, Chapter 2, sections 2.9 and 2.10 (and list of concepts).
- Kellstedt and Whitten, Chapter 3.
- Gary King, Robert O. Keohane, and Sidney Verba, Designing Social Inquiry. Princeton: Princeton University Press, 1994, pp. 99-114.
- Patrick J. Lyons, "You Gotta Believe", The New York Times, July 4, 1997.
- Sheryl Gay Stolberg, "Science, Studies, and Motherhood", The New York Times, April 22, 2001.
- John Allen Paulos, "Do Concealed Guns Reduce Crime?", ABCNews.com March 1, 2009.
- Henry Brady et al., "Law and Data: The Butterfly Ballot Episode", PS: Political Science and Politics, 34:1, 2001, pp. 59-69.

**Assignments:**

- Homework W7 due Oct 11.

## Week 8, Oct 14,16: Research Design

## Experiments (Oct 14)

**Digital Media:**

- Why the need for a research design?
- Basics of experimental design
- Drawbacks to experiments

**Readings:**

- Kellstedt and Whitten, Chapter 4, sections 4.1 and 4.2.
- Alan Krueger, "Turning Out the Vote", The New York Times, October 14, 2004.
- Thad Dunning, "Improving Causal Inference: Strengths and Limitations of Natural Experiments", Political Research Quarterly, Volume 61, Number 2, June 2008, pp. 282-293.

**Discussions:**

- Suppose we wanted to explore the relationship between hours children spent in daycare and behavioral problems in school through an experiment. What would the treatment be? What problems do you foresee with that experiment?

## Observational Studies (Oct 16)

**Digital Media:**

- Basics of observational studies
- Weaknesses of observational designs
- Which design to use?

**Readings:**

- Kellstedt and Whitten, Chapter 4, sections 4.3 and 4.4 (and list of concepts).
- John Gerring, Social Science Methodology: A Criterial Framework. Cambridge University Press, 2001, pp. 155-199.
- Raj Chetty, "Yes, Economics is a Science", The New York Times, October 21, 2013.

**Assignments:**

- Homework W8 due Oct 18.

## Week 9, Oct 21,23: Conceptualization, Measurement, Description

**Digital Media:**

- Measurement metrics
- Measures of central tendency and dispersion
- Examples

**Readings:**

- Kellstedt and Whitten, Chapter 5, sections 5.9 through 5.12 (and list of concepts).
- John H. Kranzler, Statistics for the Terrified. Third

Edition. Prentice Hall, 2003, pp. 49-63.

**Assignments:**

- Homework W9 due Oct 25.

## Week 10, Oct 28-30: Statistical Inference

**Digital Media:**

- Populations, samples, and the Normal distribution
- The Central Limit Theorem
- Applications

**Readings:**

- Kellstedt and Whitten, Chapter 6.
- Kranzler, pp. 115-123.
- Janet Buttolph Johnson and H.T. Reynolds, Political Science Research Methods. Sixth Edition, CQ Press, 2009, pp. 209-216; 227-240.
- "The Economist: Counting the casualties", The Economist, November 6, 2004.
- Charles Wheelan, Naked Statistics, Chapters 8-9.

**Assignments:**

- Homework W10 due Nov 1.

## Week 11, Nov 4: Midterm Review
## Week 11, Nov 6: Second Midterm

## Week 12, Nov 11: No Class (Veterans Day)

## Week 12-13, Nov 13,18: Hypothesis Testing

**Digital Media:**

- Evaluating bivariate relationships
- Two categorical variables
- Continuous DV and categorical IV

**Readings:**

- Kellstedt and Whitten, Chapter 7.

- Kranzler, pp. 123-127.

**Assignments:**

- Homework W12-13Oct 2, due Nov 22.

## Week 13-14, Nov 20,25: Bivariate Regression

**Digital Media**

- Basic concepts and notation
- Sample Ordinary Least Squares (OLS) model
- Inferring population values

**Readings:**

- Kellstedt and Whitten, Chapter 8.
- Edward R. Tufte, Data Analysis for Politics and Policy. Prentice Hall, 1974, pp. 65-77.
- Jeffrey A. Segal and Albert D. Cover, "Ideological Values and the Votes of U.S. Supreme Court Justices", American Political Science Review, Vol. 83, No. 2, June 1989, pp. 557-565.

**Assignments:**

- Homework W13-14 due Monday Nov 29.

## Week 14, Nov 27 (No class: Day before Thanksgiving)

## Week 15, Dec 2,4: More Regression and Midterm Review (Time Permitting

**Digital Media:**

- The problem of confounding variables
- Application to predicting incumbent vote share

**Readings:**

- Kellstedt and Whitten, Chapters 9-10

**Assignments:**

- An ungraded self-assessment quiz will be available

- What are the main differences between bivariate and multivariate regression?

## Third Midterm: Friday, Dec 20, 3-4:30pm