Please note that this syllabus is subject to change and will be updated for the current semester.

PS 3 Introduction to Empirical Analysis and Quantitative Methods
Summer 2025

Course format: online

Four (4) semester credits

Course Description

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.

Prerequisites

There are no prior course requirements other than high school level mathematics.

Course Learning Objectives

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

- Distinguish among different types of social science methodologies
- 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

Instructor Information and Communication

Course Instructor

Professor Jason Wittenberg (witty@berkeley.edu)

Graduate Student Instructor (GSI)

Marlon Jesus Guzman Valdera (guzman-valdera@berkeley.edu)

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 GSI will be an important point of contact. Your GSI is responsible for assisting you directly with questions about assignments and course requirements. The GSI will also facilitate ongoing discussion and interaction with you on major topics in each module.

Office Hours

The course instructor and GSI will offer virtual office hours, when students can communicate in real time (synchronously) using Zoom and the Chat tool. While these office hours are not strictly speaking required, they are invaluable for discussion, posing and answering questions, and reviewing for exams. All Zoom links to office hours are available through the bCourses Zoom menu item. Office hours are:

Professor Wittenberg: Wednesdays 11:30am-12:30pm, Fridays 10-11am

GSI Marlon: Tuesdays and Thursdays, 12-1pm

Each type of session will be for one hour. However, if no one shows up for the virtual office hours in the first 15 minutes, then that office hour. will be cancelled. Please note that there are no in-person meetings for this class.

We recommend attending office hours even if you think you don't need to.

Course Mail

You can also contact your GSI and instructor using the bCourses emailing system, accessed via your Inbox (in global navigation on the left). You can also choose to have your bCourses mail forwarded as text (SMS) or to your personal email.

Course Help

You're not alone in this course; the instructor and GSI are here to support you as you learn the material. It's expected that some aspects of this course will take time to grasp, and the best way to grasp challenging material is to ask questions.

To ask a question, use the weekly bCourses question and answer forum. The instructor/GSI will monitor this forum, but students who helpfully respond to questions posed there will receive up to 5% extra credit.

The question and answer (Q & A) forum should be your first choice for questions regarding course content, assignments, etc. For other questions you can also reach out to the course staff in office hours and/or via email.

Students with Disabilities

If you require course accommodations due to a physical, emotional, or learning disability, contact UC Berkeley's Disabled Students' Program (DSP). Notify the instructor and GSI through course email of the accommodations you would like to use. You must have a Letter of Accommodation on file with UC Berkeley to have accommodations made in the course.

UC Berkeley is committed to providing robust educational experiences for all learners. With this goal in mind, we have activated the ALLY tool for this course. You will now be able to download course content and reading materials in a format that best fits your learning preference (i.e., BeeLine Reader, Electronic Braille, ePUB, PDF, HTML, MP3, and translated versions). For more information, visit the alternative formats link or watch the video entitled, "Ally in bCourses."

Course Materials and Technical Requirements

Textbook / Required Materials

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

You are free to purchase your textbooks from any vendor. Please be sure to thoroughly review the return policies before making a purchasing decision as UC Berkeley does not reimburse students for course materials in the event of a textbook change or an unexpected cancellation or rescheduled course section.

Technical Requirements

This course is built on a Learning Management System (LMS) called Canvas (UC Berkeley's instance of Canvas is called bCourses). You'll need to meet these computer specifications to participate within this online platform.

Technical Support

If you're having technical difficulties please alert the GSI immediately. However, understand that neither the GSI nor the instructor can assist you with technical problems. You must call or email tech support to resolve any technical issues.

To contact tech support, click on the "Help" button on the bottom left of the global navigation menu in bCourses. Be sure to document all interactions (save emails and transaction numbers).

Learning Activities and Assignments

You're expected to fully participate in all the course activities described below.

Asynchronous Format

Your learning activities will be asynchronous (i.e., lectures, readings, assignments), which you can complete at any time before the due date. Other activities will be synchronous (i.e., office hours), which you will attend at a specific time.

All times listed are Pacific Time—please adjust for your time zone. If you prefer, you can set your own time zone to display throughout bCourses.

"Sections"

For grading purposes, each of you has been assigned to the course GSI and placed within their section. Your GSI will grade all of your

work, as well as that of your section-mates, and engage with you in the course discussions. You can see which section you've been placed in by exploring the "Section" column within the "People" page or by examining your discussion group's title, which includes your GSI's name. Please note that there will be no live section meetings separate from your GSI's office hours.

Reading Assignments

Each week, you will find the assigned reading materials posted in bCourses.

Lectures

Each week, you'll find lectures that provide important information and insights on the week's topics. All lectures have been pre-recorded, for you to watch on your own: *there are no live lecture meetings for this course*. Recorded lectures support your readings and assignments but also contain additional material that may be included in the exams. You're expected to take notes while viewing the lectures as you would in a regular classroom.

Homework - 20%

There will be eight short homework assignments and some ungraded self-assessment quizzes that put the modules' 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 you 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 will be posted at the beginning of the week, and are typically due later in the week. Please pay careful attention to the homework deadlines, which are visible on bCourses.

Discussion Questions - 10%

Each module contains one or more discussion questions to be answered and discussed by the group. This is an opportunity to pose questions to each other and the instructors about the material. Your posts and responses to others are considered your class participation and represent a unique opportunity for you to exchange views with

your classmates, share ideas, and ensure your understanding of the course material.

Discussion groups have been pre-assigned and include other members of your GSI "section." When you navigate to a discussion forum, you will automatically be taken to your group's instance of that discussion and to your group's space within the course. When finished with the discussion, you will need to navigate from your group space back to the main course space in order to continue participating in other aspects of the course.

While the Discussion assignments are asynchronous (not real time), you will be expected to make an initial posting by two days before the bCourses due date and to respond to at least one other student's position by the bCourses due date; continued participation throughout the remainder of the week is highly encouraged.

There is no one correct answer to the discussion questions. Your discussion grade will be based completion of the assignments and the sincerity with which you address the questions.

Extra Credit - 5%

As you make your way through the course material and assignments questions will inevitably arise. For each module we have therefore also set up a question and answer (Q & A) discussion forum. When questions arise we request that you post your question to this forum rather than email the instructors. We will be monitoring the forum on a daily basis, and will see the question anyway. To incentive use of this forum we are awarding extra credit of up to 5% of your course grade for posting and responding in the general questions forum. How much of the 5% you receive for this participation will depend on both the quality and quantity of your contributions, as determined by us.

First Midterm (30%) and Second Midterms - 40%

There will be two midterm exams (**July 21 and August 14**), to be taken online through bCourses. 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.

Each midterm will be open book and last 80 minutes (unless other arrangements have been made). There is not a fixed start time for these exams, which will be open from 6am-11pm on the days the exams take place. Once you open the exams the timer starts counting

down from 80 minutes. Once your 80 minutes is up the exam will close and upload automatically. Since the 11pm is the latest an exam can be submitted, you should start your exam no later than 9:40pm in order to have the full 80 minutes.

If you have a Letter of Accommodation at UC Berkeley, please confirm with your GSI that it has been received and accommodations have been made. Every time you start a quiz or exam, check to confirm you have the correct time accommodation. If not, notify your GSI immediately.

Grading

Students are expected to watch multimedia lectures, do the assigned reading, complete all exams and homework, and participate in discussions. The course grade will be based on two in-class midterms (the second of which is the "final"), homework assignments, and participation in discussions. The course grade will be determined based on the following formula (not including the extra credit):

Table 1: Final Grade Percentages

Category	Percentage of Grade
Discussion Fora	10%
Homework	20%
First Midterm Exam	30%
Second Midterm Exam	40%

It is important to note that not all components are graded online and included in the online course grade book. Because of this, the online course grade book will not display your overall course grade at any given time or your final grade. It should simply be used to assess your performance on the components that are included within it: the discussions, written assignments and midterm exams. Your final letter grade will be mailed to you by the registrar's office.

Strategies for Successful Learning

Take Care of Yourself

Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep, and taking time to recharge your mental health. Taking time to care for yourself, and avoiding academic burnout, will help you achieve your academic, professional, and personal goals.

If you start to feel overwhelmed, be kind to yourself and reach out for support. Remember that seeking help is a courageous thing to do—for yourself and for those who care about you.

Support Resources include emotional, physical, safety, social, and other basic wellbeing resources for students. Academic resources can be found at the Student Learning Center and English Language Resource sites. Berkeley's Office of Emergency Management has resources to prepare for emergencies.

Course Policies

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 and discussion forum postings all have specific final due dates and times. You will not receive full credit if assignments are submitted after the indicated due date.

Further, each online activity must be submitted through the course website by the due date. Fax, mail, and email submission will not be accepted. Students who wait until the final hours prior to a submission deadline risk having problems with their ISP, hardware, software, or various other site access difficulties. Therefore, it is advisable to submit assignments and tests through the course website early. Students should plan accordingly and get into the habit of checking the course website several times each week, and submitting and posting early.

Scheduling Conflicts

Please notify the instructor and GSI in writing by the beginning of the second week of the term about any known or potential academic or other conflicts. We will try our best to help you with making accommodations, but cannot promise them in all cases.

Academic Integrity

You're a member of an academic community at one of the world's leading research universities. Berkeley creates knowledge that has a lasting impact in the world of ideas and on the lives of others; such knowledge can come from an undergraduate paper as well as the lab of an internationally known professor. One of the most important values of an academic community is the balance between the free flow of ideas and the respect for the intellectual property of others. Scholars and students always use proper citations in papers; professors may not circulate or publish student papers without the writer's permission; and students may not circulate or post materials (handouts, exams, syllabi—any class materials) from their classes without the written permission of the instructor.

Any test, paper or report submitted by you and that bears your name is presumed to be your own original work that has not previously been submitted for credit in another course unless you obtain prior written approval to do so from your instructor. In all of your assignments, including your homework or drafts of papers, you may use words or ideas written by other individuals in publications, websites, or other sources, but only with proper attribution. If you're unclear about the expectations for completing an assignment or taking a test or examination, be sure to seek clarification from your instructor or GSI beforehand. For additional information on plagiarism and how to avoid it, read the UC Berkeley Library Citation Page, Plagiarism Section.

As a member of the campus community, you're expected to demonstrate integrity in all of your academic endeavors and will be evaluated on your own merits. The consequences of cheating and academic dishonesty—including a formal discipline file, possible loss of future internship, scholarship, or employment opportunities, and denial of admission to graduate school—are simply not worth it. Read more about Berkeley's Honor Code.

A large component of the assessments in this course requires critical thinking and synthesis of ideas. Artificial Intelligence (AI) platforms such as ChatGPT, Google Gemini, and similar applications could easily be used as a "student proxy" for this work. The danger in letting an AI platform do the synthesis and

writing is that the student will not develop these important skills as part of the course learning objectives. Additionally, AI platforms such as ChatGPT and others are notorious for making things up, and it is difficult to ascertain if the information is correct or not. Therefore, students are forbidden from using any AI platform in this course. This also applies to apps such as Grammarly that are not AI per se but use AI. Anyone found to have used AI for any component of this course will be referred to the appropriate UC Berkeley office and may fail the course.

Incomplete Course Grade

Students who have substantially completed the course but for serious extenuating circumstances, are unable to complete the midterm exams, may request an Incomplete grade. This request must be submitted in writing to the GSI and instructor. You must provide verifiable documentation for the seriousness of the extenuating circumstances.

Refer to the Office of the Registrar's website for more information on the university's policy on Incomplete Grades.

End of Course Evaluation

UC Berkeley is committed to improving our online courses and instruction. Before your course ends, please take a few minutes to participate in the course evaluation. We are interested in your online learning experience, and your feedback will help us plan for the future and make improvements. The evaluation does not request any personal information, and your responses will remain strictly confidential. Information about the course evaluation will be made available in bCourses.

Course Outline

Below is a weekly course schedule. All readings, lectures, and assignments are provided in bCourses for the assigned week. Check bCourses for specific assignment due dates.

Week 1: Preliminaries: Studying Politics Scientifically

Digital Media:

- How Do Political Scientists Answer Questions?

Readings:

- Kellstedt and Whitten, Chapter 1.
- John H. Kranzler, Statistics for the Terrified. Third Edition. Prentice Hall, 2003, pp. 8-16.
- George Will, "Iraqi Democratic Vistas", Townhall.com, September 7, 2003.

Assignments:

- Week 1 Self-Assessment
- Week 1 Homework
- Discussion fora

Week 2: Theory Building

Digital Media:

- Inductive Theory Building
- Deductive Theory Building
- Median Voter Theorem

Readings:

- Gary King, Robert O. Keohane, and Sidney Verba, Designing Social Inquiry. Princeton: Princeton University Press, 1994, pp. 14-19.
- Kellstedt and Whitten, Chapter 2, sections 2.6 through 2.8.
- Earl Babbie, The Practice of Social Research. Thirteenth Edition. International Edition. Wadsworth-Cengage, 2007, pp. 78-82.
- Kenneth A. Shepsle, Analyzing Politics. New York and London: W. W. Norton, 2010, pp. 1-30.
- 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, Analyzing Politics. New York and London: W. W. Norton, 2010, pp. 159-163.
- Robert D. Putnam, Tuning In, Tuning Out: The Strange Disappearance of Social Capital in America, Harvard University, December 1995.

Assignments:

- Week 2 Self-Assessment

- Week 2 Homework
- Discussion fora

Week 3: Game Theory

Digital Media:

- Game Theory: Basic Concepts
- Prisoner's Dilemma
- Illustrations of Prisoner's Dilemma
- Coordination Games: Assurance
- Coordination Games: Chicken
- Summary and Conclusions About Models

Readings:

- Dixit and Skeath, pp. 1-8, section 2E pp. 9-10, 15-32, 79-87, 107-112.
- Kenneth A. Shepsle, Analyzing Politics. New York and London: W. W. Norton, 2010, pp. 231-241; 245-253.

Assignments:

- Week 3 Self-Assessment
- Week 3 Homework
- Discussion fora

Week 4: Causality

Digital Media:

- Thinking About Causality
- Constructing Good Causal Theories
- Four Hurdles on the Way to a Causal Relationship

Readings:

- Kellstedt and Whitten, Chapter 3
- Gary King, Robert O. Keohane, and Sidney Verba, Designing Social Inquiry. Princeton: Princeton University Press, 1994, pp. 99-114, but skip section 3.5.2.
- 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:

- Week 4 Self-Assessment
- Week 4 Homework
- Discussion fora

July 21: MIDTERM 1

Week 5: Research Design

Digital Media:

- Introduction to Research Design
- Experiments: The Basics
- What are Experiments Good For?

Readings:

- Kellstedt and Whitten, Chapter 4, sections 4.1 and 4.2
- Kellstedt and Whitten, Chapter 4, sections 4.3-4.5
- Alan Krueger, "Turning Out the Vote", The New York Times, October 14, 2004.
- Susan D. Hyde, "The Observer Effect in International Politics: Evidence From a Natural Experiment", World Politics, Volume 60, October 2007, pp. 37-63. (Read through p. 57.)
- Raj Chetty, "Yes, Economics is a Science," The New York Times, October 21, 2013.

Assignments:

- Week 5 Self-Assessment
- Week 5 Homework
- Discussion fora

Week 6: Descriptive and Inferential Statistics

Digital Media:

- Descriptive Statistics
- Statistical Inference - Preliminaries

- The Central Limit Theorem and Its Uses

Readings:

- Kellstedt and Whitten, Chapter 6, sections 6.1 through 6.4 (but not 6.4.1 or anything after)
- John H. Kranzler, Statistics for the Terrified. Third Edition. Prentice Hall, 2003, pp. 49-63.
- Kellstedt and Whitten, Chapter 7, sections 7.1 through 7.4.
- Kranzler, pp. 115-123.
- Charles Wheelan, Naked Statistics, Chapter 8.

Assignments:

- Week 6 Self-Assessment
- Week 6 Homework
- Discussion forum

Week 7: Hypothesis Testing

Digital Media:

- Introduction to Hypothesis Testing
- Tabular Analysis
- Difference of Means
- Correlation Coefficient

Readings:

- Kellstedt and Whitten, Chapter 8Links to an external site.
- Kranzler, pp. 123-127.

Assignments:

- Week 7 Self-Assessment
- Week 7 Homework
- Discussion fora
- Course Evaluation

Week 8: OLS Regression

Digital Media:

- Introduction to Bivariate Regression
- Inferring from Sample to Population

- Multiple Regression
- Week 8 Jupyter Notebook: Regression

Readings:

- Kellstedt and Whitten, Chapter 9 (but not section 9.5)
- 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.
- Kellstedt and Whitten, Chapter 10, sections 10.1 through 10.4

Assignments:

- Week 8 Self-Assessment
- Week 8 Homework
- Discussion fora

August 14: MIDTERM 2