

## POLS 558: Research Methods for Local Government and Community Administration

CLASS LOCATION: Online (Web)

CLASS TIME: Recorded lectures will be uploaded to Canvas every Wednesday

INSTRUCTOR: Chen Wang

OFFICE: Admin Building 205J

OFFICE HOURS: Thursday 9:00am – 11:00am, or by appointment (in-person or via zoom)

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### COURSE DESCRIPTION

POLS 558 introduces students to some basic theory and methods for conducting quantitative analyses in political science and public administration, with a focus on statistics and econometrics.<sup>1</sup> The primary goals are to give you tools to begin applying quantitative methods to conduct research that informs evidence-based decision making, to prepare you for further coursework, and to situate statistics within the broader endeavor of data analysis (and that within the broader endeavor of research).

The course is divided into four parts. We begin with a brief introduction to the basic scientific inquiry and the basic research process. Then we turn to the subject of research design and descriptive statistics (univariate analysis). In the third and fourth part of the course, we examine the fundamentals of bivariate analysis, and then slowly build up to multivariate regression.

By the end of the course, you will:

- know how to acquire, clean and prepare data for analysis,
- be comfortable using R (an open-source statistical software) for data management, professional visualizations, and statistical analysis,
- be able to interpret coefficients (of simple regression models) in language that speaks to a substantive audience as well as to a technical one,
- and explain what a p-value means (and what the limitations of these inferential statistics are).

### COURSE FORMAT

This is an online course. Problem sets (homework assignments), readings, and—most importantly—**recorded lectures**, will all be posted on the [UI Canvas](#) page for this course. Each week’s recorded

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<sup>1</sup>The contemporary standards and practices of political science research generally consist of four methodological instruments: experiments (laboratory, field, and survey), statistical studies of observational data, qualitative analysis of observational data, and formal mathematical models. Our primary focus in this course is **statistical studies of observational data**.

lecture (and lab sections for later weeks) will be posted on every Wednesday evening. There will also be an online discussion board (also on Canvas) that helps us engage more with each other. Please check your Canvas regularly for announcements, assignments, and dues.

## TEXTBOOKS

There are two required textbooks for this course:

- Evan Berman and Xiaohu Wang. 2013. *Essential Statistics for Public Managers and Policy Analysts*. Fourth Edition. Washington, DC: CQ Press.
- Hadley Wickham and Garrett Grolemund. 2016. *R for Data Science: Import, Tidy, Transform, Visualize, and Model Data*. First edition. Sebastopol, CA: O'Reilly.

This R book is available for free online at <https://r4ds.had.co.nz/index.html>. The authors of the book have announced that this website will always be free to use. But if you would like a physical copy of the book, you can order it from [amazon](#).

Most of our weekly readings will come from the first textbook (Berman and Wang 2013). Additional readings will be posted on Canvas. The second textbook (Wickham and Grolemund 2016) serves more as a handbook that assists you with homework assignments and research projects.

## STATISTICAL SOFTWARE

In this course, we will be using R as the primary platform for statistical computations. Stata, Python, SAS, or even SPSS can do most of the techniques we cover (and do them well). But R has its advantages. It is and will continue to be absolutely 100% free. It is the most widely used software platform by serious statisticians (that means when a new statistical method is developed, researchers usually will write a new R library to run the new model and release it to the public). Thus, learning R can better prepare you for future more advanced (and more specialized) quantitative method courses.

Before the course begins, please download the following free software, or update them to the latest versions (and feel free to play with it):

- **R**, available from the Comprehensive R Archive Network (CRAN): <https://cran.r-project.org/>
- **R Studio**, an excellent user interface for R available at: <https://www.rstudio.com/>

## COURSE REQUIREMENTS

Your grade in this course will be derived from your performance on the following three components:

- Professionalism: 20%

Professionalism means a few things. Primarily, it entails acting like a professional that you are. That means completing tasks, meeting deadlines, participating in online discussion

boards regularly, and providing support and encouragement to your peers. It also entails being respectful, courteous, thoughtful, ethical, and attuned to class diversity.

- Homework Assignments: 40%

There will be five homework assignments over the course of the term. Each assignment is graded on a 0-100 scale. The due dates can be found in the course schedule below. Late submissions receive a 5-point deduction for each day late except in the event of a documented medical or family emergency.

- Research Paper: 40%

Another major assignment for this course will be to write a journal-length research paper where you apply the tools introduced in this class. The paper should be 20-25 page long and double-spaced with 12-point font (including Reference).<sup>2</sup> The final submission of the paper should also include a replication file (e.g., data and R scripts) that allows readers to successfully replicate your results. The research paper should be formatted the same way as those published in prominent academic journals such as *Public Administration Review* and *American Journal of Political Science*. That means the paper should include the following components: an abstract, introduction, literature review, theory and hypotheses, data and methods (research design), results, and conclusion.<sup>3</sup> You will be asked to complete this paper in stages, with the following deadlines:

- February 3: Research Proposal
- February 24: Literature review
- March 24: Theory and hypotheses
- April 14: Data and methods
- May 5: Final paper submission

There will be no curving in this class. Final letter grades will be calculated as follows:

[90, 100]	A
[80, 90)	B
[70, 80)	C
[60, 70)	D
[0, 60)	F

## COURSE POLICIES

### Academic Integrity

Cheating and plagiarism are taken very seriously in this course. All assignments must be solely original work of the student. Violations include quoting or paraphrasing another author without attribution on written assignments. Avoid plagiarism by using footnotes (with page numbers)

<sup>2</sup>You can include a separate Appendix to report additional findings (e.g., robustness checks).

<sup>3</sup>A more detailed prompt will be distributed later in the semester.

whenever you quote, paraphrase, or otherwise borrow someone else's ideas. If you are unsure whether you are committing plagiarism, do not hesitate to ask me for guidance (before you submit your work). Note that forming a group to study for homework assignments or offering feedback on a draft of another student's paper are not considered violations of academic integrity. On the other hand, writing portions of a classmate's paper or copying a paragraph from a book or website without attribution are very serious violations. It is the policy of our department to refer instances of suspected academic dishonesty to the Student Judicial Council. For the Dean of Students' Academic Integrity site, see <https://www.uidaho.edu/student-affairs/dean-of-students/student-conduct/academic-integrity>.

### **Learning Environment Civility**

In any environment (including online) in which people gather to learn, it is essential that all members feel as free and safe as possible in their participation. To this end, it is expected that everyone in this course will be treated with mutual respect and civility, with an understanding that all of us (students, instructors, and guests) will be respectful and civil to one another in discussion, in action, in teaching, and in learning. Should you feel our classroom interactions do not reflect an environment of civility and respect, you are encouraged to meet with your instructor during office hours to discuss your concern. Additional resources for expression of concern or requesting support include the Dean of Students office and staff (5-6757), the UI Counseling & Testing Center's confidential services (5-6716), or the UI Office of Human Rights, Access, & Inclusion (5-4285).

### **Grade Appeals**

Hopefully there will be no reason to contest a grade. However, a student who believes strongly that a homework assignment or the paper has been graded incorrectly may appeal by writing a one-page, typed memo explaining why the grade was inappropriate. No sooner than 72 hours and no later than 10 days after the original grade was issued, the memo must be submitted along with the original graded assignment to me for re-grading.

### **Religious Holidays**

Although students are expected to meet every due/deadline, exceptions will of course be made for religious holidays. Students who know they will miss any deadline owing to observance of a religious holiday need to notify the instructor during the first week of the semester.

### **Accommodations**

Reasonable accommodations are available for students who have documented temporary or permanent disabilities. All accommodations must be approved through the Center for Disability Access and Resources (CDAR) located in the Bruce M. Pitman Center, Suite 127 in order to notify your instructor(s) as soon as possible regarding accommodation(s) needed for the course.

- PHONE: (208)885-6307
- EMAIL: [cdar@uidaho.edu](mailto:cdar@uidaho.edu)
- WEBSITE: <https://www.uidaho.edu/current-students/cdar>

## COURSE SCHEDULE

The subsequent weekly schedule and assignments in this course are tentative and subject to change. Due dates for **homework assignments** and different portions of the **research paper** are **highlighted** and marked in **Teal** and **Red** respectively.

### *Part 1: The Scientific Method in Political Science and Public Administration*

- **Week 1 (Jan 11-13): Course Introductions and Syllabus Review**
- **Week 2 (Jan 16-20): Ethics and the Scientific Method**
  - Berman and Wang, Chapter 1
  - Kellstedt and Whitten, Chapter 1 (posted on Canvas)
- **Week 3 (Jan 23-27): The Front End**
  - Johnson, Reynolds and Mycoff, Chapter 3: Beginning the Research Process (Posted on Canvas)
  - Kellstedt and Whitten, Chapters 2 and 3 (posted on Canvas)
  - Webster and Watson, Analyzing the Past to Prepare for the Future: Writing a Literature Review (posted on Canvas)

### *Part 2: Research Design and Descriptive Statistics*

- **Week 4 (Jan 30-Feb 3): Research Design**
  - Berman and Wang, Chapters 2, 3, and 5
  - **Feb 3: Research proposal due on Canvas by midnight**
- **Week 5 (Feb 6-10): Descriptive Statistics**
  - Berman and Wang, Chapters 6 and 7

### *Part 3: Bivariate Analyses*

- **Week 6 (Feb 13-17): Hypothesis Testing and Chi-Squared Tests**
  - Berman and Wang, Chapters 8 and 11
  - **Feb 17: Homework 1 due on Canvas by midnight**
- **Week 7 (Feb 20-24): T-Tests and ANOVA**
  - Berman and Wang, Chapters 12 and 13
  - **Feb 24: Literature review of the paper project due on Canvas by midnight**
- **Week 8 (Feb 27-Mar 3): Correlation and Bivariate Regression**
  - Berman and Wang, Chapter 14
  - **Mar 3: Homework 2 due on Canvas by midnight**
- **Week 9 (Mar 6-10): Review of Methods**
  - No readings, just review
  - **Mar 10: Homework 3 due on Canvas by midnight**

- **Week 10 (Mar 13-17)**
  - Spring Break–No Class This Week

*Part 4: Multivariate Analyses and Regression Diagnostics*

- **Week 11 (Mar 20-24): Multivariate Regression**
  - Berman and Wang, Chapter 15 (pp. 246–253)
  - **Mar 24: Theory and hypotheses section of the paper due on Canvas by midnight**
- **Week 12 (Mar 27-31): Dummy Variables and Interactions**
  - Berman and Wang, Chapter 15, specifically Use of Nominal Variables (pp. 254–256)
  - Princeton University Library, Working with Dummy Variables (available [online](#))
  - Brambor, Clark, and Golder. 2006. Understanding Interaction Models: Improving Empirical Analyses (posted on Canvas)
  - **Mar 31: Homework 4 due on Canvas by midnight**
- **Week 13 (Apr 3-7): Regression Diagnostics (Outliers, Multicollinearity, and Non-linearity)**
  - Berman and Wang, Chapter 15 (pp. 257–259)
  - Farrar and Glauber. 1967. Multicollinearity in Regression Analysis: The Problem Revisited
  - Hainmueller, Mummolo, and Xu. 2019. Ho Much Should We Trust Estimates from Multiplicative Interaction Models
- **Week 14 (Apr 10-14): Regression Diagnostics (Heteroscedasticity, Autocorrelation, Measurement & Specification)**
  - Berman and Wang, Chapter 15 (pp. 260–264)
  - **Apr 14: Data and methods portion (research design) of the paper due on Canvas by midnight**
- **Week 15 (Apr 17-21): Logistic Regression**
  - Berman and Wang, Chapter 16 (pp. 273–279)
- **Week 16 (Apr 24-28): Time Series Data**
  - Berman and Wang, Chapter 16 (pp. 279–286)
  - **Apr 28: Homework 5 due on Canvas by midnight**
- **Week 17 (May 1-5): Final Paper Completion**
  - **May 5: Final Paper Due by Midnight**