

Advanced Research Methods

POLS 370

Meeting Times: T & TR 12:30 - 1:45 P.M. CST

Location: Buckman 325

Instructor

Professors Ali Masood

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Office: 308 Buckman Hall

Office Hours: Tuesday & Thursday 10 A.M. - 12 P.M. or by Appointment

Course Overview

The course will introduce students to the fundamentals of research methods in political science. The course will cover a range of topics, including the scientific method, the nature of causality, coding, programming, and quantitative data analysis techniques. Over the course of the semester, we will explore the theory of statistical models, applied linear regression, and maximum likelihood estimation (MLE). Collectively, these elements will provide students a thorough understanding of how research is conducted by those who study politics and other topics within the social sciences. Ultimately, the goal of this course is to provide students an understanding of how real people apply real techniques to real data, in order to answer critical questions about the real world. This is an advanced reading and writing intensive course designed for Political Science majors interested in graduate studies and quantitative careers.

Learning Outcomes

Upon completing this course, students will:

1. Be able to understand and advanced concepts and terms associated with statistical inference.
2. Have a thorough understanding of the fundamentals of political inquiry.
3. Understand hypothesis testing, p-values, standard deviations, confidence intervals, and statistical bias.
4. Be able to design a study, collecting the data, and interpret regression results.
5. Be able to present data through tables and graphical techniques.
6. Develop original research ideas and execute original research, generating a conference worthy research paper.

Required Textbook

The textbook listed below is available for purchase online and at the campus bookstore:

- ★ Kellstedt, Paul M. and Guy D. Whitten. 2018. *The Fundamentals of Political Science Research*. 3rd Ed. Cambridge University Press.
- ★ Kellstedt, Paul M. and Guy D. Whitten. 2018. *A Stata Companion for the Third Edition of the Fundamentals of Political Science Research*. Cambridge University Press.
- ★ King, Gary. 1998. *Unifying Political Methodology: The Likelihood Theory of Statistical Inference*. University of Michigan Press.

Required Slack Account

This class will use Slack for class-related communication. All students are required to join the course using their college email address. Students enrolled in this class understand that Slack, and not email, is the primary communication platform. Please download the app or login daily for updates. The Slack channel for the course is: research-methods-fall-2022. You will receive an email prompt to join.

Course Structure and Evaluation

In this course, we will engage in a variety of activities, including lecture-based discussion, critical evaluation of the readings, and application of statistical techniques. Over the course of the semester, students in this course will be evaluated on the following: attendance and participation, Slack discussion posts, home work assignments, a midterm exam, a research design, and an original research paper.

Attendance and Participation & Discussion Posts

Regular on-time attendance to class is expected from each student. Attendance includes reading the assigned material for the session as well as adequately preparing for the discussion of the material in class. All students are required to pose a question or a thought that comes from the readings on Slack once a week.

Homework Assignments

Throughout the semester you will be assigned problem sets to conduct statistical analyses. All work should be professionally prepared and written. You are encouraged to discuss the exercises with each other and work in groups. However, the written results must be the product of your own labor and should be completed independently. In order to complete these assignments, students will need to use statistical software such as Stata, R, or Python. Students may use statistical software of choice to complete their work. It is strongly encouraged that you keep a log file of each assignment and submit the replication code along with your write-up. All homework assignments are due electronically via Slack.

Midterm Exam

There will be one midterm exam in this course. The exam is designed to test the student's knowledge and comprehension of assigned readings and the discussion in class. Thus, it is worth reiterating the importance of completing your reading and attending class. The exams will consist of short essay questions. Make-up examinations are only offered when there is documented proof of a medical emergency that is excused by the professor. In the event of such a medical emergency, a student may be given an alternative make-up exam. This decision is at the discretion of the instructor. If a student misses an exam due to a medical emergency, the student must contact the instructor as soon as it is practical to do so. If a student fails to appear or submit an exam on time for any other reason, a grade of zero will be recorded.

Research Design

Students are required to complete an original research design in the course. The research design can explore any aspect of Political Science from a quantitative perspective. The scope of the paper is purposely broad so that the student can produce a quality research design on a topic that is of interest to the student. Each research design should identify a research question, discuss related previous research, offer at least one hypothesis, and discuss an appropriate sources to obtain data to test the hypotheses. Early in the semester, students are required to submit a short one-page proposal that will form the basis of their research design. Students are encouraged to schedule appointments early in the semester to discuss potential research topics. The research design should be approximately 12-15 pages in length.

Research Paper

Students in the class are required to complete an original research paper. The research should be an extension of the research design. The final paper will be a revised iteration of the research design with additional sections for results and a conclusion. A key requirement of the research paper is to incorporate linear regression or maximum likelihood estimation within the analysis. Early submission of rough drafts for instructor comments is highly encouraged. The research paper should be approximately 20-25 pages in length.

General Expectations

Each student is expected to regularly attend class, arrive on-time, and leave only after the instructor has adjourned the day's session. Students are expected to be cordial with each other and the instructor to facilitate a good learning environment. Students with concerns relating to the classroom environment should bring them to the attention of the instructor before or after class or during office hours.

Technology in the Classroom

Students are encouraged to use tablets and laptops in the class to take notes and participate in class activities. Multitasking with material that does not relate to the class interferes with the learning process and can be highly distracting to other students.

Accommodations

Students requiring accommodations should contact the Office of Student Accessibility Services at 901-843-3885, so that appropriate arrangements can be made. Students should also bring any request for reasonable accommodation to the attention of the instructor.

Honor Code

Students should familiarize themselves with the Rhodes College Honor Code and policy for academic integrity. All work in this course is expected to be completed by the student submitting the work. Academic dishonesty, in any form, will not be tolerated. Students who engage in academic dishonesty by cheating or plagiarizing will receive a grade of zero for the work. In addition, the student may also receive a failing grade for the course. Violations of the Honor Code may result in expulsion from the college.

Grade Appeals

Instructors occasionally make a mistake in grading. If a student wishes to appeal their grade, a written (typed) appeal must be submitted with the original graded work. Successful appeals will clearly identify specific mistakes made in the original grading.

Grade Distribution

Attendance & Participation	10%
Weekly Discussion Posts	10%
Homework Assignments	20%
Midterm Examination	15%
Research Design	20%
Final Research Paper	25%

Grading Scale

100 - 90.00	A	70.00 - 76.99	C
87.00 - 89.99	B+	67.00 - 69.99	D+
80.00 - 86.99	B	60.00 - 66.99	D
77.00 - 79.99	C+	<= 59.99	F

Course Schedule

The schedule of courses is listed on the following page also lists the reading assignment for the session. The readings are listed by the class date prior to which they should be completed. Students should complete the reading assignments in their entirety. Students should make note of two important points. First, this course is reading intensive. Second, the readings listed below are required readings for the course – they are not optional. It is critical that students come to class prepared to discuss the material.

Week One: Introduction to Research Methodology

Required Readings:

- ★ Granato, Jim and Frank Scioli. 2004. "Puzzles, Proverbs, and Omega Matrices: The Scientific and Social Significance of Empirical Implications of Theoretical Models (EITM)." *Perspectives on Politics* 2(2): 313-323.
- ★ Schrodtt, Philip A. 2014. Seven Deadly Sins of Contemporary Quantitative Political Analysis. *Journal of Peace Research* 51(2): 287-300.
- ★ King, Gary. 1995. "Replication, Replication." *PS: Political Science & Politics* 28(3): 444-452.
- ★ Kellstedt, Paul M. and Guy D. Whitten. 2018. *The Fundamentals of Political Science Research*. 3rd Ed. Cambridge University Press. [Chapters 1-2]

Week Two: Causal Inference and Political Inquiry

Required Readings:

- ★ Brady, Henry E., David Collier, and Jason Seawright. 2006. "Toward a Pluralistic Vision of Methodology." *Political Analysis* 14(3): 353-368.
- ★ Beck, Nathaniel. 2010. "Causal Process "Observation": Oxymoron or (Fine) Old Wine." *Political Analysis* 18(4): 499-505.
- ★ Kellstedt, Paul M. and Guy D. Whitten. 2018. *The Fundamentals of Political Science Research*. 3rd Ed. Cambridge University Press. [Chapter 3]
- ★ King, Gary. 1998. *Unifying Political Methodology: The Likelihood Theory of Statistical Inference*. University of Michigan Press. [Chapters 1-2]

Week Three: Exploring the Theory of Statistical Models

Required Readings:

- ★ Achen, Christopher H. 2002. "Toward a New Political Methodology: Microfoundations and ART." *Annual Review of Political Science* 5(1): 423-450.
- ★ Clarke, Kevin A. 2005. "The Phantom Menace: Omitted Variable Bias in Econometric Research." *Conflict Management and Peace Science* 22 (Winter): 341-352.
- ★ Miller, Warren E., and Donald E. Stokes. 1963. "Constituency Influence in Congress." *American Political Science Review* 57(1): 45-56. [Substantive Article]
- ★ King, Gary. 1986. "How Not to Lie with Statistics: Avoiding Common Mistakes in Quantitative Political Science." *American Journal of Political Science* 30(3):666-687.

Week Four: An Introduction to Statistical Platforms

Required Readings:

- ★ Altman, Micah, and Michael P. McDonald. 2001. "Choosing Reliable Statistical Software." *PS: Political Science & Politics* 34(3): 681-687.
- ★ Kellstedt, Paul M. and Guy D. Whitten. 2018. *The Fundamentals of Political Science Research*. 3rd Ed. Cambridge University Press. [Chapter 4]
- ★ Kellstedt, Paul M. and Guy D. Whitten. 2018. *A Stata Companion for the Third Edition of the Fundamentals of Political Science Research*. Cambridge University Press. [Chapters 1-4]
- ★ King, Gary. 1998. *Unifying Political Methodology: The Likelihood Theory of Statistical Inference*. University of Michigan Press. [Chapter 3]

Week Five: Coding, Curating, and Manipulating Data

Required Readings:

- ★ Kellstedt, Paul M. and Guy D. Whitten. 2018. *The Fundamentals of Political Science Research*. 3rd Ed. Cambridge University Press. [Chapters 5-6]
- ★ Kellstedt, Paul M. and Guy D. Whitten. 2018. *A Stata Companion for the Third Edition of the Fundamentals of Political Science Research*. Cambridge University Press. [Chapters 5-6]
- ★ King, Gary. 1998. *Unifying Political Methodology: The Likelihood Theory of Statistical Inference*. University of Michigan Press. [Chapter 4]

Week Six: Linear Regression and Gauss-Markov Assumptions

Required Readings:

- ★ Achen, Christopher H. 2005. "Achen, Christopher H. 2005. "Let's Put Garbage-Can Regressions and Garbage-Can Probits Where They Belong." *Conflict Management and Peace Science* 22: 327-339.
- ★ McGregor, James P. 1993. "Procrustus and the Regression Model: On the Misuse of the Regression Model." *PS: Political Science & Politics* 26(4): 801-804.
- ★ Krause, George A. 1994. "Is Regression Analysis Really Leading Political Science Down a Blind Alley?" *PS: Political Science & Politics* 27(2): 187-190.
- ★ Kellstedt, Paul M. and Guy D. Whitten. 2018. *The Fundamentals of Political Science Research*. 3rd Ed. Cambridge University Press. [Chapters 7-8]

Week Seven: Applied Linear Regression Modeling and Interpretation

Required Readings:

- ★ King, Gary, Michael Tomz, and Jason Wittenberg. 2000. “Making the Most of Statistical Analyses: Improving Interpretation and Prediction.” *American Journal of Political Science* 44 (2): 347-361.
- ★ Stimson, James A. 1985. “Regression in Space and Time: A Statistical Essay.” *American Journal of Political Science* 29(4): 914-947.
- ★ Brambor, Thomas, William Roberts Clark, and Matt Golder. 2006. “Understanding Interaction Models: Improving Empirical Analyses.” *Political Analysis* 14(1): 63-82.
- ★ Kellstedt, Paul M. and Guy D. Whitten. 2018. *A Stata Companion for the Third Edition of the Fundamentals of Political Science Research*. Cambridge University Press. [Chapters 7-8]

Week Eight: Maximum Likelihood Estimation and Dichotomous Outcomes

Required Readings:

- ★ Berry, William D., Jacqueline H.R. DeMerritt, and Justin Esarey. 2010. “Testing for Interaction in Binary Logit and Probit Models: Is a Product Term Essential?” *American Journal of Political Science* 54 (1): 248-266.
- ★ King, Gary and Langsche Zeng. 2001. “Logistic Regression in Rare Events Data.” *Political Analysis* 9(2): 137-163.
- ★ Hagle, Timothy M., and Glenn E. Mitchell. 1992. “Goodness-of-Fit Measures for Probit and Logit.” *American Journal of Political Science* 36(3): 762-784.
- ★ King, Gary. 1998. *Unifying Political Methodology: The Likelihood Theory of Statistical Inference*. University of Michigan Press. [Chapter 5]

Week Nine: Maximum Likelihood Estimation and Ordered Choice Models

Required Readings:

- ★ Winship, Christopher and Robert D. Mare. 1984. “Regression Models with Ordinal Variables.” *American Sociological Review* 49(3): 512-525.
- ★ Franklin, Charles H. and Liane C. Kosaki. 1989. “Republican Schoolmaster: The Supreme Court, Public Opinion, and Abortion.” *American Political Science Review* 83(3): 751-771. [Substantive Article]
- ★ Kellstedt, Paul M. and Guy D. Whitten. 2018. *The Fundamentals of Political Science Research*. 3rd Ed. Cambridge University Press. [Chapter 12]

Week Ten: Maximum Likelihood Estimation and Multinomial Choice Models

Required Readings:

- ★ Alvarez, R. Michael and Jonathan Nagler. 1998. “When Politics and Models Collide: Estimating Models of Multiparty Elections.” *American Journal of Political Science* 42 (1): 55-96. [Substantive Article]
- ★ Dow, Jay K. and James W. Endersby. 2004. “Multinomial Probit and Multinomial Logit: A Comparison of Choice Models for Voting Research.” *Electoral Studies* 23(3): 107-122.
- ★ Paolino, Philip. 2021. “Predicted Probabilities and Inference with Multinomial Logit.” *Political Analysis* 29(3): 416-421.

Week Eleven: Maximum Likelihood Estimation and Event Count Models

Required Readings:

- ★ King, Gary. 1988. “Statistical Models for Political Science Event Counts: Bias in Conventional Procedures and Evidence for the Exponential Poisson Regression Model.” *American Journal of Political Science* 32(3): 838-863.
- ★ Masood, Ali S., Benjamin J. Kassow, and Donald R. Songer. 2017. “Supreme Court Precedent in a Judicial Hierarchy.” *American Politics Research* 45(3): 403-434. [Substantive Article]
- ★ Shields, Todd G., and Chi Huang. 1995. “Presidential Vetoes: An Event Count Model.” *Political Research Quarterly* 48(3): 559-572. [Substantive Article]

Week Twelve: Clustering, Hierarchical Data, and Multilevel Modeling

Required Readings:

- ★ Arceneaux, Kevin and David W. Nickerson. 2009. “Modeling Certainty with Clustered Data: A Comparison of Methods.” *Political Analysis* 17(2): 177-190.
- ★ Beck, Nathaniel, and Jonathan N. Katz. 1995. “What to Do (and Not to Do) with Time-Series Cross-Section Data.” *American Political Science Review* 89(3): 634-647.
- ★ Franzese, Robert J., Jr. 2005. “Empirical Strategies for Various Manifestations of Multilevel Data.” *Political Analysis* 13 (3): 430-446.
- ★ King, Gary, and Margaret E. Roberts. 2015. “How Robust Standard Errors Expose Methodological Problems They Do Not Fix, and What to Do About It.” *Political Analysis* 23(2): 159-179.

Week Thirteen: Spatial Data and Time-Series Analysis

Required Readings:

- ★ Beck, Nathaniel. 2001. “Time-Series-Cross-Section Data: What Have We Learned in the Past Few Years?” *Annual Review of Political Science* 4: 271-293.
- ★ Beck, Nathaniel, Jonathan N. Katz, and Richard Tucker. 1998. “Taking Time Seriously: Time-Series Cross-Section Analysis with a Binary Dependent Variable.” *American Journal of Political Science* 42 (3): 1260-1288
- ★ King, Gary. 1998. *Unifying Political Methodology: The Likelihood Theory of Statistical Inference*. University of Michigan Press. [Chapter 11]

Week Fourteen: Issues with Statistical Modeling

Required Readings:

- ★ Achen, Christopher. 2000. “Why Lagged Dependent Variables Can Suppress the Explanatory Power of Other Independent Variables.” Paper Presented at the Annual Meeting of the American Political Science Association.
- ★ Ioannidis, John PA. 2005. “Why Most Published Research Findings are False.” *PLoS Medicine* 2(8): e124.
- ★ King, Gary, James Honaker, Anne Joseph, and Kenneth Scheve. 2001. “Analyzing Incomplete Political Science Data: An Alternative Algorithm for Multiple Imputation.” *American Political Science Review* 95(1): 49- 69.
- ★ King, Gary, and Langche Zeng. 2006. “The Dangers of Extreme Counterfactuals.” *Political Analysis* 14(2): 131-159.

Week Fifteen: Putting it all Together

Required Readings:

- ★ Gill, Jeff. 1999. “The Insignificance of Null Hypothesis Significance Testing.” *Political Research Quarterly* 52(3): 647-674.
- ★ Hanmer, Michael J., and Kerem Ozan Kalkan. 2013. “Behind the Curve: Clarifying the Best Approach to Calculating Predicted Probabilities and Marginal Effects from Limited Dependent Variable Models.” *American Journal of Political Science* 57(1): 263-277.
- ★ Keele, Luke. 2015. “The Statistics of Causal Inference: A View from Political Methodology.” *Political Analysis* 23(3): 313- 335.

Week Sixteen: Course-Wrap Up, Review, and Final Exam

- ★ Final Exam due 48 hours after distribution