

## PLS: Introduction to Methods of Political Analysis

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### Class Objectives

Data is omnipresent in the modern world. It pervades many aspects of society, from business decision-making, to policy analysis (was the expansion of Medicaid a successful policy?), to election forecasting (will Romney beat Obama?), to sports science (matchup predictions and fantasy football), as well as determining the punishment of NFL uber-stars (Tom Brady). To be successful in the modern world, regardless of our prospective discipline, we thus need to have a solid foundation to digest statistical information. This class is designed to help you walk, think, and scrutinize like a scientist. It begins with an investigation of the philosophy of science, understanding what we can expect to learn from the scientific process and the common pitfalls of human reason. We will then go through the nuts and bolts of research design and data analysis, starting with very basic topics but ending up with a treatment of regression analysis – the workhorse approach to how we learn about the world around us.

This course is also designed to be engaging and practical. A large component of the course is structured to give students the ability to analyze data of their choice and directly learn from the scientific process first-hand. We will learn how to interpret basic statistical results from published research, and how to identify and attempt to solve threats to inference. It will most closely give a clear understanding of how political science approaches scientific enquiry, but will also develop a foundation for students to better understand most fields, including such topics as Quantum Field Theory and Climatology. Thus, while a political science methods course, students will gain detailed knowledge about the process of science more broadly.

### Required Books:

- *Naked Statistics (NS)*; Charles Wheelan, 2013.
- *Philosophy of Science, A Very Short Introduction*. Okasha. 2002.
- *The Essentials of Political Analysis*. Philip Pollock III. 2012.
- \*\*\* Not required to purchase, but I will upload readings: *Don't Believe Everything You Think*. Thomas Kida.
- \*\*\* Will upload: *The Fundamentals of Political Science Research*. Kellstedt & Whitten (KW). 2013.
- \*\*\* Will upload: *Introductory Econometrics: A Modern Approach*. Wooldridge.

### This is the grade scale I use to guide my grading decisions.

Below 60 = 0    60-64.9 = 1    65-69.9 = 1.5    70-74.9 = 2    75-79.9 = 2.5    80-85.9 = 3    86-92.9 = 3.5    93-100 = 4

### Requirements and Grading:

- **Data Project – 20%**
  - Stage 1 (5%): Short essay assignment brainstorming research ideas for the final paper. The idea does not need to be “new”, it just needs to be a subject you are interested in and want to learn about directly from the data itself. Discuss whether there is available data which will allow you to conduct this analysis.
  - Stage 2 (5%): Short essay describing the research idea. You should identify several scholars who have worked on this idea already, and discuss their findings. Your paper can either propose how to innovate and examine the question differently, or it may be as simple as seeing if you can reproduce their findings. Discuss your approach, what data you will use, and identify any threats to inference (hint: there are some). It’s ok if you don’t know how to “solve” the threat at this point, just try and identify potential problems.
  - Stage 3: In-class data and computer code exercises (R or Stata code). You will be given time to actually try and execute your data analysis and seek help from me for any problems.

- Stage 4 (10%): Write the final 4 to 5 page research paper. It should build off of your work (and feedback) from Stage 2. Give the brief literature review, the purpose of your analysis, your research design, and present your findings.
- **3 Response Essays** (Collectively worth **10%** of the final grade)
  - 2 page response essays which discuss your reaction to the previous weeks readings (since the last response essay was due). Discuss what you have found most interesting, illuminating, or exciting about the scientific research process. Use clear examples from the text. You need to demonstrate you have digested and thought about the reading content.
- **Mid-term and Final exam (30% each, for 60% total)**
  - The exams will be mostly multiple choice but will also include some short-response questions.
- Attendance and **quiz responses (10% of grade)**
  - This component will be scored by taking **i-clicker quizzes *each class period***. It will cover the readings and lecture from previous class, as a means of checking your retention. I will drop the 2 lowest scores. I will also randomly choose 5 quizzes to count as pure extra-credit, giving you the ability to improve your overall grade. This built-in flexibility means, however, that I do not accept any excused absences whatsoever. If you have a bad day and miss class, you should make every effort to improve future attendance so you can catch extra credit quiz days.
    - For the i-clicker quizzes, you will get partial credit even with incorrect guesses, and this forms the attendance component of this grade. The remainder is earned by correctly answering the quiz questions.

## Course Outline

The outline below is subject to changes; students are responsible for any changes I announce in class. The readings assigned to a particular date will be discussed in class during that week. You should be prepared to answer any questions about the material for that week on any day we meet.

- Week 1 Introduction to course themes and Syllabus Review.
- Week 2 Pseudo-science and Science. What's the difference?
  - NS: Ch. 1
  - Kida: *Don't Believe Everything You Think*: pp.11-44
  - Okasha CH 1: What is science?
- Week 3 Puzzles, Hypotheses and Theory
  - Kida: *Don't Believe Everything You Think*: pp.44-83
  - Okasha CH 2 – “Scientific Reasoning”; CH 5 “Scientific Change and... Revolutions”
  - **\*\*\*\* Data Project Stage 1: Due \*\*\*\***
- Week 4 Measurement, Data, and Research Design
  - NS: Ch. 7 “The Importance of Data”
  - **<<Response Essay 1 due>>**
- Week 5 Measurement, Data, and Research Design (continued)
  - NS: Ch. 8 – “The Central Limit Theorem: The LeBron James of Statistics”
- Week 6 Descriptive and causal inference
  - NS: CH's 3 and 4– Descriptive Statistics, and Correlation
  - KW CH 3 “Evaluating Causal Relationships”
- Week 7 Causal inference (continued); Is Tom Brady guilty?
  - NS: CH's 5.5 and 6
  - <https://fivethirtyeight.com/datalab/fivethirtyeight-dissects-the-deflategate-report/>
  - <http://content.iospress.com/download/journal-of-sports-analytics/jsa0014?id=journal-of-sports-analytics%2Fjsa0014>
  - **\*\*\*\* Data Project Stage 2: Due \*\*\*\***

- Week 8                   Probability and causal inference (continued, again)
  - KW CH 6 “Probability and Statistical Inference”
  - Pollock CH 6 “Foundations of Statistical Inference”
  - <<*Response Essay 2 due*>>
  
- Week 9                   **\*\*\*In-class Data Project Stage 3\*\*\***
  
- Week 10                 **Midterm Review & Midterm**
  
- Week 11                 **Spring Break – No class**
  
- Week 12                 Sampling, Polling and Surveys
  - NS: CH 10
  - [http://themonkeycage.org/2009/07/should\\_we\\_get\\_rid\\_of\\_polls/](http://themonkeycage.org/2009/07/should_we_get_rid_of_polls/)
  
- Week 14                 Observational studies, Experiments and Quasi-Experiments
  - KW CH 4 “Research Design”
  - Pollock CH 4 “Research Design”
  
- Week 15                 Regression Analysis
  - NS: Ch. 11 and 12: “Regression Analysis: The Miracle Elixir”, and “Common Mistakes”
  - Wooldridge CH 2 “The Simple Regression Model”
  
- Week 16                 Regression Analysis (continued)
  - Wooldridge CH’s 3 and 4 – “Multiple Regression Analysis: Estimation”, and “Inference”
  - <<*Response Essay 3 Due*>>
  
- Week 17                 **Final Review & Exam**
  - **\*\*\*\* Data Project Stage 4: Due on Final Review Day beginning of class \*\*\*\***

### Academic Integrity

Plagiarism and other academic dishonesty will not be tolerated. All work is expected to be original, *and not previously or simultaneously turned in for credit in another course* (unless you get explicit permission from me beforehand). All students at Michigan State University are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion).

### Disabilities Accommodation

The Americans with Disabilities Act of 1990 (ADA) provides protection from illegal discrimination for qualified individuals with disabilities. Students requesting instructional accommodations due to disabilities must arrange for such accommodation. If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities.

### Religious Observation Policy

<http://www.hr.msu.edu/documents/facacadhandbooks/facultyhandbook/religiousobservance.htm>

## Sexual Violence and Relationship Misconduct Policy

[http://www.hr.msu.edu/documents/uwidopolproc/RVSM\\_Policy.htm](http://www.hr.msu.edu/documents/uwidopolproc/RVSM_Policy.htm)

Books you are strongly encouraged to examine and consider for your reference library (Those marked with an “\*” are books you should probably just buy now to have for your entire career):

- Science and pseudoscience
  - *Why people believe weird things*; Michael Shermer
  - *Designing Social Inquiry*; King Keohane and Verba \*
  - Kida, Thomas. 2006. *Don't Believe Everything You Think*.
  - Johnson, Janet Buttolph and H.T. Reynolds. 2012. *Political Science Research Methods 7<sup>th</sup> edition*
  - Okasha, Samir. 2002. *Philosophy of Science: A Very Short Introduction*
  - *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*; Shadish, Cook, and Stanley\*
  - *The Total Survey Error Approach: A Guide to the New Science of Survey Research*; Weisberg, Herbert
  - *Rethinking Social Inquiry*; Brady and Collier
  - *Introduction to the Philosophy of Science*; O’hear, Anthony
  - *Night comes to the Cretaceous*; James Lawrence Powell
  - *The Immortal Life of Henrietta Lacks*; Rebecca Skloot
  - *Anatomy of an Epidemic*; Whitaker
  - *Wittgenstein’s poker*
  - *Leviathan and the Air-Pump*; Shapin and Schaffer
  - *Introductory Readings in the Philosophy of Science*; Klemke et al.
- Thinking, non-thinking, and belief
  - *Don't believe everything you think*; Kida, Thomas
  - *Crimes Against Logic*; Jamie Whyte
  - *Nonsense*; Gula, Robert J.
  - *Proofiness*; Charles Seif
  - *Blink* and *What the Dog Saw*; Gladwell, Malcom
  - *Being Wrong*; Kathryn Shultz
  - *Denialism*
  - *Predictably Irrational*; Ariely, Dan
  - *Fooled by Randomness or The Black Swan*; Taleb, Nicholas
  - *Blind Spots*; Van Hecke
  - *Sway*; Brafman and Brafman
  - *On Being Certain*; Robert Burton
  - *How We Decide*; Lehrer
  - *The Invisible Gorilla*; Chabris and Simons

- *Stumbling on Happiness*: Daniel Gilbert
- Math and innumeracy
  - *Naked Statistics*, Wheelan, Charles
  - Ian Hacking books
    - *An introduction to probability and inductive logic\**
    - *Emergence of probability*
    - *Taming of chance*
  - *A Mathematician reads the Newspaper*, Paulos, Allen
  - *Common Errors in Statistics and How to Avoid Them*, Good and Hardin
  - *Statistics as Principled Argument*, Abelson
  - *A Quantitative Tour of the Social Sciences*, Gelman and Cortina
  - *A Drunkard's Walk*, Mlodinow
  - *Mostly Harmless Econometrics*: Angrist and Pischke
  - *Innumeracy*, Paulos, Allen
  - *How to Lie with Statistics*: Darrell Huff
  - *Damned Lies and Statistics*: Joel Best
  - *Chicago Guide to Writing about Multivariate Analysis*: Jane Miller
  - *Chicago Guide to Writing about Numbers*: Jane Miller