POLS 3000: Research Methods in Political Science
Utah State University

Spring 2019
Professor Josh M. Ryan

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Office Hours: Monday and Wednesday, 3 p.m. to 4:00 p.m., and by appointment. If you cannot meet me at office hours, please email and we will find a time that works.
Class Time and Location: 9:30-10:20 a.m. Monday, Wednesday, and Friday, Huntsman Hall 170 *or* Ag Science (AGRS) 135 on computer lab days (to be determined).

Course Description

This course is an introduction to the modern, social scientific approach to politics. Students will learn the process by which political inquiry is conducted within the academic and policy realms, and learn some basic research and statistical techniques that serve this purpose.

Social scientific "analysis" seems to be all around us, and is used by the media, politicians, interest groups, technology firms, and pundits to make claims about how society works. As we will learn in this course, modern, academic social science is not what most journalists, commentators, or politicians engage in. Rather than making value judgments, or advancing an opinion or agenda, most social scientists are concerned with explaining the way in which the world works, similar to scientists in other fields. The term given to this non-biased, non-ideological scientific approach to understanding the world is commonly referred to as the search for causal inference, or understanding the causes of political phenomena of interest. One of the primary goals of this class is to introduce students to the idea that politics, economics, sociology and other social sciences can be studied in a scientific way, and that we can actually understand the factors that cause certain political, economic, or sociological outcomes.

This course will focus on the scientific method, research design, and quantitative analysis. Though analyzing social outcomes in a quantitative manner is only one approach to the scientific study of politics, economics, and other disciplines, it has quickly become the (arguably) dominant one in most subfields of political science and other social science fields. In political science, Americanists use quantitative methods to study legislative outcomes and public opinion through the use of surveys, international relations scholars use it to study the frequency and causes of war and trade agreements, and comparativists use quantitative methods to measure public opinion and economic outcomes in other countries.

I realize that, for whatever reason, students who enjoy social science frequently have an aversion to math. I hope that this course provides an introduction to many of the most important concepts without being overly mathematical; I assume little prior math knowledge and look forward to working with students to develop their mathematical ability. Many students leave the course with an appreciation of the importance of certain mathematical techniques to social science, and some students may find they actually enjoy using quantitative techniques to answer important, complicated, social scientific questions.

Finally, this course will be relevant to other fields and applications. The rise of "big data"[1] and the search for causation is an important trend in fields from sports analytics to social media. Students who take this course are encouraged to continue using statistics in their work in college and beyond. In today's information

[1]This term is thrown around a lot, though no one knows what it actually means. I interpret it to mean any quantitative analyses using many observations.

world, there is, a deficit of people trained to make sense of quantitative data. The role of statistics is rapidly increasing in public policy, government, politics, business, sports, media, and many other parts of society. For more, see: "For Today's Graduate, Just One Word: Statistics," "The 10 Skills Employers Most Want In 2015 Graduates,", and "Why Basic Data Analysis Is The Most Valuable Skill You Can Learn."

Course Requirements and Other Important Information

The entire course closely follows the design of Kosuke Imai's Introduction to Quantitative Social Science" course that he teaches at Princeton University. We will be using the book he created from that class. All readings should be completed by the start of class. This ensures that you will fully understand the lecture topics, and that you are able to engage with other students and myself. There are many things I will not cover that will be in the reading that I will build on. Because there is a relatively light amount of reading, you will be expected to complete all of it on time. If any supplemental readings are assigned, they will be emailed ahead of time. Falling behind on the reading is the single easiest way to do poorly in this class. It is very difficult to catch up on the reading in the week before the test.

During lectures, I have a no cell phone policy. My cell phone policy this semester will be as follows. Between every test, the entire class is allowed three strikes. If I see or hear a cell phone that is one strike. If we make it to the midterm without reaching three strikes, I will give the entire class a bonus point for each strike left over. If the three strikes are used by the midterm, no bonus points will be given. For the sake of your classmates, please ensure your cell phone is on silent and please do not text in class. If you cannot avoid looking at your phone, please leave it at home. When we are in the computer lab or using our laptops, please avoid looking at the internet. Obviously, it is much more difficult to police the class in these conditions, but your use will not only distract you, but also your classmates. If I see a student using the computer for non-class related activities, I may give the entire class a pop quiz on the spot.

There will be three midterms (see below). The tests will cover all the material discussed in class. If you cannot complete the tests on the schedule below, you should drop the class. Make-up or late tests will be allowed at my discretion, and only under the most unusual extenuating circumstances. If you miss more than one test you will not be allowed to make-up both. I will require documentation for any missed exam.

The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary. The most likely changes will be to the dates on the course schedule. This syllabus is not a contract and is subject to change at the sole discretion of the instructor as announced in class.

The tape recording of lectures is not permitted, though exceptions may be made for students with a documented disability.

This class, like many in political science, often deals with subjects that are controversial. Engaging with these issues is an important part of being an informed citizen and as such, we will not shy away from discussing controversial current events. This also means you should never feel embarrassed or afraid to share your opinion, even if it means disagreeing with other students in the class. However, each of us should remember that we have different experiences and different viewpoints. We must always be respectful of other students and other opinions. I take this policy very seriously and have **zero tolerance** for inappropriate, crude, disrespectful, or demeaning comments. I reserve the right to use an appropriate punishment for any student who engages in disrespectful behavior. This may include removal from the class, receiving a zero on an assignment, or being reported to university officials. Please speak with me promptly if you feel there is a civility problem in the classroom. See the USU Student Code of Conduct at `https://studentconduct.usu.edu/studentcode/article5`.

If you need to contact me or set up a time to meet outside of my regularly scheduled office hours, don't hesitate to speak to me after class or send me an email. I check my email at least once daily and usually multiple times per day. If you have questions or do not understand the material please come to my office hours

prior to the day before the midterm, final, etc. I will make every effort to respond to your email as soon as possible. During the normal work week, I promise to respond to an email within 24 hours. On the weekends, and during breaks, vacations, or holidays, I may not respond as quickly. In other words, if you email me Friday night, it is entirely possible I won't respond until sometime Monday. If 24 hours have gone by during a normal work week and I haven't responded, please email me again. It's possible I lost/forgot about/never received the message.

I do not take attendance *per se*, so if you miss a class it is not necessary to tell me. However, there are some substantial costs to missing class. First, you will miss items that are discussed in class that will be on the test and homeworks. This class moves very quickly and if you miss a number of classes it will be almost impossible for you to catch up and do well. I also encourage students to be active learners, asking questions in class of me, and engaging in discussion with your fellow students.

The Americans with Disabilities Act states: "Reasonable accommodation will be provided for all persons with disabilities in order to ensure equal participation within the program." If a student has a disability that will likely require some accommodation by the instructor, the student must contact the instructor and document the disability through the Disability Resource Center (797-2444), preferably during the first week of the course. Any request for special consideration relating to attendance, pedagogy, taking of examinations, etc., must be discussed with and approved by the instructor. In cooperation with the Disability Resource Center, course materials can be provided in alternative format, large print, audio, diskette, or Braille.

I will periodically send out emails to the class list. You are automatically subscribed to the list if you are enrolled in the class through your campus email account or other email you specify. The list will allow me to inform you of changes in assignments, the schedule or to attach additional reading. I cannot send emails out to an email account not recorded by the University. The USU preferred email listed is an official means of communication between myself and the students. If you have any questions, please see USU's Email Communications Policy at `http://catalog.usu.edu/content.php?catoid=12&navoid=3142` and/or talk to me.

Please see `http://www.usu.edu/provost/faculty-life/syllabus.cfm` for additional USU and course policies on academic freedom, the grievance process, sexual harassment, and the withdrawal and incomplete process.

Textbook

Imai, Kosuke (2017). Quantitative Social Science: Introduction. Princeton University Press.

Statistical Software

We will be using the R language environment. R is free and open-source, making it a popular and powerful tool for statistical computing and graphics. It makes simulation and sampling easily accessible. To get a better sense of R's popularity: read a summary of software use in data analytics here: `http://r4stats.com/articles/popularity/`.

We will program in R (www.r-project.org), using an interface RStudio (www.rstudio.com). While very powerful, R can be more difficult to learn than some of its alternatives. For this reason it is critical you come to class and give this course your full attention and effort.

Grading

There are six grades for this class: Swirl assignments, homeworks, and four midterms.

Please submit all assignments through Canvas. I will provide directions in class.

Swirl Assignments, @ 15%

Swirl assignments help with practice coding and are completed within the R environment. They will be graded as "full credit". "partial credit," or "no credit". By completing the Swirl assignments and turning in clean code, you will receive full credit for the Swirl assignment. No late Swirl assignments will be accepted.

Homework Assignments, @ 25%

There are four homework assignments throughout the class. The homework assignments are open book and open notes, but please turn in your own work. The homework assignments are graded on a point system. Your overall grade percentage on the homeworks will be the total number of points received on all homework assignments. I understand that things happen that are out of your control. Because of this, across all homework assignments, I will allow you to use two total late days throughout the semester. That is, if you cannot turn in a homework assignment on time, you have up to two days to turn it in for full credit. Once you use up your two days, no late homework assignments will be accepted and you will receive a zero for the assignment.

Four Midterms, @ 15% each

The format of the midterms will be short answer for conceptual questions, and producing the correct R code and results. Part of the midterms will be open notes and part will be open book and open notes, but please turn in your own work. Your grade on this section will be the total number of points received across all three midterms. No late midterms will be accepted. Please look at the schedule below and ensure that you will be able to turn in the midterms.

Misc. Grading Information

I will be happy to regrade anything with the understanding that the grade could be higher or lower than the original grade. In order to have me regrade something, you need to give me a written explanation of your specific concerns within one week. There will be no review sheet for the tests, but we will review in class.

There will be no extra credit assignments given or accepted.

Plagiarism and/or cheating will not be tolerated under any circumstances. Anyone caught plagiarizing or cheating will receive a grade of zero on the assignment and/or the course, and may be reported to the Vice President of Student Services. Please see the Student Code of Conduct at `http://www.usu.edu/studentservices/studentcode/article6.cfm` for USU's policies on plagiarism.

You must complete all assignments to pass the class.

Schedule

Please note this schedule is tentative. I reserve the right to change it, and add or subtract readings or assignments.

Jan. 7: Syllabus and introduction to social science
Reading: The syllabus

Jan. 9: Social Science and Causal Inference
Reading: None

Jan. 11: Concepts and Measurement, Introduction to R
Reading: None

Jan. 14: Loading R and R Studio, using markdown files
Reading: 19-28

Jan. 16: Data structure, variables, distributions
Reading: 1-19

Jan. 18: Lab Day, Swirl assignments 1 and 2 due at 5 p.m. Homework 1 posted
Reading: None

Jan. 21: No class—MLK Day

Jan. 23: Causal Inference and Counterfactuals
Reading: 32-46

Jan. 25: Randomized Control Trials, Homework 1 due.
Reading: 46-54

Jan. 28: Observational Studies
Reading: 54-63

Jan. 30: Observational Studies (continued)
Reading: 63-69

Feb. 1: Swirl assignment 3 due at 5 p.m. Midterm 1 Part I in class, Midterm 1 Part II assigned

Feb. 4: Causal Inference Summary
Reading: None

Feb. 6: Causal Inference Summary (continued)
Reading: None

Feb. 8: No class, Midterm I Part II due

Feb. 11: Survey Sampling
Reading: 75-88

Feb. 13: Survey Sampling (continued)
Reading: 88-96

Feb. 15: Lab day, Swirl assignments 4 and 5 due at 5 p.m., Homework 2 posted

Feb. 18: No class, President's day

Feb. 20: Survey Sampling (continued)
Reading: 96-108

Feb. 22: Lab Day, Homework 2 due
Reading: None

Feb. 25: Prediction
Reading: 123-139

Feb. 27: Prediction
Reading: None

Mar. 1: Midterm 2 Part I in class, Midterm 2 Part II assigned
Reading: None

March 4: Introduction to Regression
Reading: 139-161

March 6: Regression (continued)
Reading: 161-170

March 8: No class, Midterm 2 due

March 11-15: Spring Break

March 18: Treatment Effects and Regression Discontinuity
Reading: 170-182

March 20: Treatment Effects and Regression Discontinuity (continued)
Reading: None

March 22: Lab Day, Swirl assignments 6, 7 and 8 due at 5 p.m. Homework 3 posted
Reading: none

March 25: Probability
Reading: 242-254

March 27: Variables and Distributions
Reading: 277-286

March 29: Midterm 3 Part I in class, Midterm 3 Part II assigned, Homework 3 due
Reading: None

April 1: Distributions (continued)
Reading: 286-306

April 3: Uncertainty
Reading: 314-332

April 5: No class (political science conference), Midterm 3 due. Homework 4 posted
Reading: None

April 8: Uncertainty and Hypothesis testing
Reading: 332-342

April 10: Hypothesis testing (continued)
Reading: 342-361

April 12: Lab day, Homework 4 due
Reading: None

April 15: Regression
Reading: 361-370

April 17: Regression (continued)
Reading: 370-378

April 19: Lab day, Swirl assignments 9 and 10 due.
Reading: 378-390

April 22: Part I of Midterm 4 in class and Part II Midterm 4 assigned
Reading: None

May 1: Midterm 4 due