Introduction to Political Research
Government 310

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Course Information

Government GOVT 310
Introduction to Political Research
Section 001: Monday and Thursday, 12.55–2.10pm, Kerwin 105

Instructor Information

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Office Hours:

8/27-9/2 (first week): Monday, 3-5pm
9/3-9/9 (second week): No office hours; I'm out of town
11/19-11/25 (Thanksgiving): Monday, 3-5pm
Otherwise Friday, 2-4pm, and generally by appointment via Slack

Course Description

This course is an introduction to modern quantitative political research. We will discuss the nature of quantitative research, how to design research to answer different types of political questions, how to analyze quantitative data, and how to interpret the results of analysis. We will use the open-source software R to analyze data. Specific topics will include causal inference, descriptive statistics, visualization, linear regression models, and statistical testing and inference.

Learning Objectives

By the end of the course, you should be able to:

- Translate political phenomena into quantitative hypotheses
- Differentiate causal from descriptive statistical analyses
- Understand the value and limitations of specific quantitative methods
- Test substantive hypotheses using quantitative methods

- Conduct original data analysis in R that uses a technique from the course to answer a relevant political science question
- Use R to import and manipulate data, perform analyses, and produce publication-quality graphics

Resources

Readings

Readings should be completed before the course meeting under which they are listed below. The primary text book for this course is:

Imai, Kosuke (2018). *Quantitative Social Science: An Introduction.* ISBN: 9780691175461

It is available from the AU bookstore and on Amazon. The course readings are primarily from the textbook. The textbook was designed for Princeton undergraduate students and engages with some of the most recent, most interesting research in political science and cognate social sciences. All other readings are available on the course Blackboard page (http://blackboard.american.edu).

Software and Statistics Support

The software for quantitative analyses we will use in this course is R. I have compiled an introductory guide entitled "Using the Statistical Software Package R" to get you started. It is available on the course Blackboard page and walks you through the initial setup as well as the basic functions. R is free to download and use. The Center for Teaching, Research and Learning (CTRL) also holds regular R workshops. See https://www.american.edu/ctrl/rsgevents.cfm for their schedule. The Department of Mathematics and Statistics offers statistical consulting services, with extensive hours. For their schedule and contact information, see http://www.american.edu/cas/mathstat/tutoring.cfm. Since R is an open-source software and thus continuously being developed, googling specific problems, as silly as it may sound, also often provides immediate help. Websites such as https://stackoverflow.com are particularly helpful. Finally, I strongly encourage you to talk to me and to each other through Slack (see section "Communication" below) for any R-related questions. You will often find that one of your classmates has encountered the same problem as you and can provide input.

Computers and Notes in Class

We will focus our attention on statistical concepts. We will also discuss implementation of methods in R. There will be time in class to pose your specific questions about R coding. As such, I strongly encourage you to bring a laptop to class to try out new code, update your code files etc. All slides and notes will be available the evening before class on Blackboard. I will also provide printed handouts for each session. You are free to take notes on the computer or by hand.

Communication

Outside of the classroom, we will use Slack as our vehicle of communication. Slack is a free messaging application for team collaboration. It allows any number of people in a team to communicate through channels that are visible to everyone in the team. You can also send any member(s) private messages. Slack works on all laptops, tablets and smartphones. You can use Slack in the browser or download the Desktop client (highly recommended). The Windows version is here and the Mac version is here. All of us together in class form one team. I will create our team and send an invitation to each of you via email.

Why don't we just use emails? It is much, much more convenient to have all things course-related in one space. This makes it much easier to keep track of discussions and issues without searching through an email client.

Requirements and Evaluation

Students are required to do the weekly reading, attend class, complete all assignments, and contribute significantly to course discussions about the material. Using the course Slack channels to ask and answer questions is strongly encouraged, and will contribute to your participation evaluation. The final course assessment includes four components:

Assignment	Weight	Due date
Problem Sets (3)	30%	Sep 20, Oct 15, Nov 19
Labs (3)	30%	Oct 1, Oct 22, Nov 12
Final Paper (Memo, Presentations, Paper)	30%	Nov 1, Dec 3 & 6, Dec 6
Participation (Attendance, Slack, `swirl` exercises)	10%	

Table 1: Course Assessment Summary

No late work will be accepted. If you cannot submit an assignment on time, arrange to submit it early. I strongly encourage you to use office hours to discuss any specific assignments, difficulties, or questions about the course. All assignments will be graded according to the standard grading scale:

Grade	Quality Points
A (Excellent)	4.00
A-	3.67
B+	3.33
B (Good)	3.00
B-	2.67
C+	2.33
C (Satisfactory)	2.00
C-	1.67
D (Poor)	1.00
F (Academic Fail)	0.00

Table 2: Grading Scale

Problem Sets

The three problem sets should be completed outside of class. You should submit two versions of your solution: (1) A printed out hard copy solution at the start of the class in which the problem set is due, (2) A digital version to the course Blackboard site under Content/Assignments/Problem Sets/[PS number]. It is strongly encouraged that you work together with others on the problem sets (coding is a collective activity), but every keystroke of your submission must be your own. I will provide `R` templates for your submissions on the course Blackboard page.

Lab Sessions

The three labs will take place in class. During these class meetings, you will work with a randomly-selected partner on a data analysis task. The task will reflect methods we've studied in class, but will require applying them to new data. I will be in the room and available to answer questions and help with typesetting problems, but you and your teammate will be responsible for performing, documenting, and submitting your analysis during class. At the end of class, you will submit your team solution to the designated folder on the course Blackboard page, at Content/Assignments/Labs/[Lab number]. I will provide `R` templates for your submissions on the course Blackboard page. If you are not present at a Lab session, you will need to complete an alternative assignment on your own in the week after the Lab session.

Final Paper

For the final project, you will have the exciting opportunity to engage in original political science research using real data that policymakers want to learn about. In conjunction with The Lab @ DC, a research arm of the Executive Office of the Mayor, I will provide you with a handful of data sets pertaining to policies and programs of Washington, DC. Topics will include DC's new $15 minimum wage, voter turnout, campaign finance and expenditures, promoting minority-owned business, the 311 request system, and affordable housing. If you have a strong inclination to work on another topic, speak with me early in the semester. I

recommend starting with the data available at http://opendata.dc.gov.

You will select one of these data sets, pose an appropriate political research question that the data can answer with quantitative methods, analyze the data, write a short data analysis report, and present your research to the class in one of the last two meetings. You are welcome to augment the data provided with any other appropriate data you need (this is optional, but this sort of bridging often defines the most innovative social science work).

Your project should represent original data analysis, and should address a question of interest to policymakers and/or the research community. It should represent quantitative social science at the highest level you can muster. You should work with one other student on the final project. Working collaboratively is typical in political science research.

Your proposal memo for the paper, due roughly a month before the presentations and the final version, should succinctly answer several questions: What is your research question? What literature will your paper participate in? What data will your paper utilize? How do you expect to analyze the data? What conclusions will you draw, given certain results?

Your final paper should be submitted by 11.59pm on December 6. It should be fewer than 1500 words, and include at least one compelling data visualization.

Participation

Slack: I strongly encourage you to ask questions (both to me and to each other) and debate the course content on Slack. Each of you has 30 highly qualified peers plus one instructor at their disposal if you need help with anything course-related – use this resource.

`swirl` Exercises: Modern applied social science requires using a computer to analyze data. We will do so using R, which is free, open-source, powerful, and in-demand. The best way to learn R is to try it. `swirl` is an R package that is designed to teach you R. Completing the `swirl` exercises will help you learn the techniques of the course and will be needed to participate in class discussions. Instructions on how to get started with `swirl` are on page 9 of the Imai book.

Intellectual Property

Course content is the intellectual property of the instructor or student who created it, and may not be recorded or distributed without consent.

Course Evaluation

The course evaluation will take place in class towards the end of the semester. Students who submit the evaluation will earn one percentage point toward the participation grade.

Academic Integrity

All students are required to follow the University's Academic Integrity Code. If you have not already done so, please familiarize yourself with the standards and requirements of the University's Academic Code of Conduct. Violations of the Code of Conduct will not be tolerated and will be reported appropriately. You can find more information about the University's Academic Integrity Code here.

Emergency Preparedness

In an emergency, AU will implement a plan for meeting the needs of all members of the university community. Should the university be required to close for a period of time, we are committed to ensuring that all aspects of our educational programs will be delivered to our students. These may include altering and extending the duration of the traditional term schedule to complete essential instruction in the traditional format and/or use of distance instructional methods. Specific strategies will vary from class to class, depending on the format of the course and the timing of the emergency. Faculty will communicate class-specific information to students via AU e-mail and Blackboard, while students must inform their faculty immediately of any absence due to illness. Students are responsible for checking their AU e-mail regularly and keeping themselves informed of emergencies. In the event of a declared pandemic or other emergency, students should refer to the AU Web Site and the AU information line at (202) 885-1100 for general university-wide information, as well as contact their faculty and/or respective dean's office for course and school/college-specific information. The Academic Support and Access Center (ASAC) supports the academic development and educational goals of all American University students and is committed to providing access for individuals with disabilities within the university's diverse community.

Academic Support

The Academic Support & Access Center is located in Mary Graydon Center (MGC), Room 243. Phone extension: x3360. Fax extension: x1042. Email: asac@american.edu. Hours: M-F, 9am-5pm. Website: http://www.american.edu/ocl/asac/

Calendar

27 August

Introduction to quantitative social science

- ☐ Required reading: This syllabus.

30 August

Introduction to statistical computing environments

- ☐ Required reading: Imai, Chapter 1
- ☐ Required exercises in R: `swirl() INTRO1`

3 September

No class (Labor Day)

6 September

No class (I am away in LA)

10 September

Causal Inference I
We will look at `swirl() INTRO2` in class. If you complete it before class, you'll be even better prepared to have your questions answered.

- ☐ Complete the First Week Checklist
- ☐ Required reading: Imai §2.1-2.4, especially §2.3

13 September

Randomized experiments and observational studies

- ☐ Required reading: Imai §2.5-2.6
- ☐ Required exercises: `swirl() CAUSALITY1`

17 September

Descriptive statistics

- ☐ Required reading: Imai §2.7
- ☐ Required exercises: `swirl() CAUSALITY2`

20 September

Visualization

- ☐ Required reading: Imai §3.1-3.4
- ☐ Problem Set 1 due

24 September

Bivariate statistics, survey sampling

- ☐ Required reading: Imai §3.5-3.6
- ☐ Required exercises: `swirl() MEASUREMENT1`

27 September

Clustering

- ☐ Required reading: Imai §3.7-3.8
- ☐ Required exercises: `swirl() MEASUREMENT2`

1 October

Lab I

4 October

Prediction and classification

- ☐ Required reading: Imai §4.1
- ☐ Required exercises: `swirl() PREDICTION1`

8 October

Linear regression I

- ☐ Required reading: Imai §4.2
- ☐ Required exercises: `swirl() PREDICTION2`

11 October

Linear regression II

- ☐ Required reading: Imai §4.3
- ☐ Required exercises: `swirl() PREDICTION3`

15 October

Regression + Causal Inference

- ☐ Required reading: Imai §4.4
- ☐ Problem Set 2 due

18 October

Catch up, review

22 October

Lab II

25 October

Probability I

- ☐ Required reading: Imai §6.1-6.2.2

29 October

Probability II

- ☐ Required reading: Imai §6.2.3-6.2.4

1 November

Probability III

- ☐ Required reading: Imai §6.3
- ☐ Required exercises: `swirl() PROBABILITY1`
- ☐ Final paper memo due

5 November

Probability IV: Random variables and distributions

- ☐ Required reading: Imai §6.4-6.5
- ☐ Required exercises: `swirl() PROBABILITY2`

8 November

Uncertainty I: Standard errors and confidence intervals

- ☐ Required reading: Imai §7.1
- ☐ Required exercises: `swirl() UNCERTAINTY1`

12 November

Lab III

15 November

Uncertainty II: Hypothesis testing

- ☐ Required reading: Imai §7.2 (especially §7.2.3 and §7.2.4)
- ☐ Required exercises: `swirl() UNCERTAINTY2`

19 November

Uncertainty III: Hypothesis testing

- ☐ Review Imai §7.1 and §7.2 as needed
- ☐ Problem Set 3 due

22 November

No class (Thanksgiving)

26 November

Uncertainty IV: Inference about linear regression

- ☐ Required reading: Imai §7.3-7.4
- ☐ Required exercises: `swirl() UNCERTAINTY3`

29 November

Catch up and review
Fill out course evaluations (online)

3 December

Presentations I

6 December

Presentations II

- ☐ Final paper due