

POLITICAL SCIENCE 281:
DATA IN POLITICS I: AN INTRODUCTION
Syllabus¹

Fall 2021

Instructor: Simon Hoellerbauer
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Class Meetings: T/Th 5:00 – 6:15 PM (ET), Carolina Hall 0220

Office Hours: T/Th 10:00 - 11:30 am (On Zoom); or by appointment.

Zoom links can be found on Sakai page.

Course Description

The Information Revolution has dramatically expanded the volume of information we have about the world around us. Social scientific analytical skills are transforming many sectors—business, journalism, law, public policy, health care, and finance, to name but a few—and are more valued now than ever. However, more information has not been the panacea that some hoped, and misinformation and misinterpretation of information have become significant problems in today’s world. The broad learning objective for this course is to help students become better consumers of information by developing the tools they need to be informed participants and active leaders in data-driven sectors. More specifically, the learning objectives are:

1. To increase students’ comfort and facility managing data in the R statistical language, with an emphasis on versatile tools such as loops, sampling functions, merging datasets, and the GGPlot data visualization software;
2. To teach basic principles of data description, including standard descriptive plots and statistics; and
3. To develop students’ ability to use data to answer important social scientific questions.
4. To learn how to acquire new quantitative skills autonomously, such as by reading software documentation.

Students will leave this class with the competencies they need to conduct basic analysis on many different forms of data, as well as the foundation they need to acquire more advanced

¹Text, ideas, and topics for this syllabus adopted and adapted from Stephanie Shady, Lucy Britt, Jacob Smith, Lucy Martin, Tim Ryan, Leah Christiani, and Isabel Laterzo.

skills (such as characterizing uncertainty in data and testing formal hypotheses).

The target audience for this course is undergraduate students with interest in the social sciences (not only Political Science), who want to use quantitative approaches to solve important problems and develop marketable analytical skills. This course is a prerequisite for *POLI 381: Data in Politics II: Frontiers and Applications*.

This course fulfills the Quantitative Intensive (QI) requirement in UNC's Making Connections curriculum. It also counts as a course in research methods (required for completing the Political Science Bachelor's degree).

Class Structure

This class is comprised of lectures, in-class activities, (some) readings, and assignments. It is highly interactive. I will rarely lecture for a full class-period — we learn best by doing, after all. We will use Poll Everywhere for for some in- and out-of-class activities, mainly comprehension checks. We will use Piazza as a Wiki-style question and answer/discussion forum. This makes it easier for the instructor and ULAs to answer common questions and also allows students to crowd-source answers. There are some readings — most often from the textbook (see [below](#)), but also newspaper articles and some academic journal articles.

Unless indicated, you are expected to have completed the readings and assignments by the date they are listed in the course schedule (see [below](#)).

Assignments and Grading

Course assessment is broken down as follows:

PARTICIPATION (15%) Your participation grade has three components. The first component is preparation for (and actual participation in) class. We will have many activities throughout the semester, some individual and some in groups. Participating in class means being active during such activities, as well as during class discussions.

The second component is participation in our class's online Piazza discussion forum. (See Sakai for a link.) On Piazza, you can benefit your participation grade **either** by posting your own questions or by providing thoughtful answers to other students' questions (The website keeps track of your activity). These statistics, too, are advisory to the summary participation grade.

The final component is completion of ungraded online quizzes throughout the semester. These quizzes may not happen, but I reserve the right to assign them. These quizzes are ungraded, and are designed to help me gauge overall progress and comprehension in the class.

Missing one or two classes will generally not negatively affect your participation score. If you find yourself missing more than 3 classes, it is your responsibility to come and talk to me about what's going on.

HOMEWORK (45%) There will be five homework assignments due as noted in the schedule [below](#). They are weighted equally. These homework assignments are due by 11:59pm on the days indicated, unless we decide something different in class. Homeworks 2, 3, and 5 will be completed in groups (to which you will be assigned at the beginning of the semester). Homeworks 1 and 4 will be completed individually. After each homework, you will do a evaluation of your own and your group members' contributions to the assignment.

DATACAMP (10%) During the course of the semester, you will be required to complete several DataCamp (see Class Texts and Software section [below](#)) lessons with accompanying exercises. These will be assessed for completion. The DataCamp assignments

FINAL PROJECT (30%) The class has a capstone final project for which students, working in groups (the same ones as the homeworks), conduct and present an original data analysis on an existing dataset. To make it a bit more straightforward, you will be provide with three possible dataset options. As a group, you will select a relevant political issue or question, which information in the dataset you choose will help you understand. Together, you will theorize about some factors that might explain that issue or answer the question and analyze the data to see whether your expectations were supported.

As a default, all final project group members receive the same grade. However, under *extraordinary* circumstances, I may assign different grades when the work was not shared equitably. Additionally, if one group member is significantly disrupting progress (such as by not providing timely responses to communication or by missing scheduled meetings), this person can be removed from the group, and required to complete an alternative final project alone. If you are having difficulty with your group or do not feel comfortable in your group, please let me know. You will also evaluate yourself and your group members for each part - I will take these evaluation into account when calculating your grade.

This project is spread out throughout the semester:

- **Project Proposal (5%)**: Each group must turn in by email a two-page, double-spaced paper proposal by October 7. This should include a brief description of the issue or question you plan to examine and which dataset you intend to use. Make sure to address why this topic is interesting to you and/or important within political science. This proposal should include an initial description of your research question, theory, and hypotheses. Please make an appointment to talk with me during the first few weeks of class if your group is having any trouble figuring out what topic you would like to pursue.
- **Preliminary Analysis: (5%)**: Each group must turn in a preliminary data analysis, which includes the key statistics used to test your hypotheses, by November 19. This assignment, totaling approximately two to three double-spaced pages, requires a brief description of the data used, explanation of the methods you used, the relevant

statistical outputs you computed, and an indication of whether and why the outputs support or oppose your paper's hypotheses.

- **Paper (15%)**: The final research paper is due by the time of the final exam (4pm Dec. 10). This paper should be approximately 10 pages, double-spaced, not counting any tables, figures, or the bibliography. We will discuss the citation style and my expectations for the specific sections of the paper in class. The paper grade will be based on the quality of your writing, the critical thinking you display throughout the paper, the persuasiveness of your theory and analysis, and how well you apply concepts from class lectures, discussions, and readings. Each group will turn in one paper.
- **Presentation (5%)**: At the end of the semester, each group will make a presentation (with slides) about its research. These presentations will take place during the final exam period for this class (4pm, Dec. 10). Each presentation should be approximately 10 minutes, and time will be left for questions and answers after each presentation. Grades will be based on the appropriate application of concepts we have learned in class to the discussion of your research project, accuracy, the level of critical thinking displayed, and your ability to answer questions in response to your presentation.

Note also that, the weighting scheme above notwithstanding, all assignments must be submitted. If you have not submitted an assignment, you are at risk of receiving a course grade of I (Incomplete) until it is complete.

Grading Scale

I will use the following grading scale:

- A: 100-92.5; A-: less than 92.5-89.5
- B+: less than 89.5-86.5; B: less than 86.5-82.5; B-: less than 82.5-79.5
- C+ less than 79.5-76.5; C: less than 76.5-72.5; C-: less than 72.5-69.5
- D+: less than 69.5-66.5; D: less than 66.5-59.5
- F: less than 59.5-0

Some professors make subjective decisions about rounding up or down in certain ranges (92-93, for example). This has always struck me as unfair and, well, subjective. This grading scale makes it clear exactly what percentage you need to get for a particular letter grade. I will not do any further rounding beyond this.

Class Texts and Software

This course has one required textbook:

1. Imai, Kosuke. 2017. *Quantitative Social Science: An Introduction*. Princeton: Princeton University Press.

QSS in the [schedule](#) refers to this textbook.

This book has additional online resources, including more R-learning support, which you can access here:

<http://qss.princeton.press/student-resources-for-quantitative-social-science>

I usually do not assign textbooks, but they are very useful for this kind of course. This text will be a good resource for you going forward, and not just in this class. This book is thankfully relatively inexpensive. Professor Imai is one of the best, well-known political methodologists out there (he's also a pretty nice guy!). You will not need this book until the second part of the course (indicated in the schedule at the end of this syllabus).

In addition, there are software requirements. Students must download and install R, a free statistical program available at <http://cran.r-project.org/>, as well as RStudio (also free), which is available at www.rstudio.com. They also must register for DataCamp (www.datacamp.com), a resource that provides tutorial videos and interactive training modules to help learn programming skills. Data Camp is free for students enrolled in this class. (I will provide you with login information.) **Please do not pay for Data Camp access!**

Helpful Resources

You are in no way expected or required to read and/or use these resources. They are just here if you are interested in learning more and would like to know where to start looking.

For Learning R:

- Learn R at UNC through R Open Labs/beginR: <http://ropenlabs.web.unc.edu/>
- Wickham, Hadley² and Garrett Grolemund. 2017. *R for Data Science*. Sebastopol, CA: O'Reilly. — **DO NOT BUY THIS BOOK**; you can access its contents for free online here: <https://r4ds.had.co.nz/>.

For Learning More About R As A Programming Language:

- Wickham, Hadley. 2019. *Advanced R*. Second Edition. Boca Raton, FL: Taylor & Francis. — **DO NOT BUY THIS BOOK**; you can access its contents for free online here: <https://adv-r.hadley.nz/>.

For Statistics:³

- Diez, David, Mine Cetinkaya-Rudel, Christopher Barr, and OpenIntro. 2019. *OpenIntro Statistics*. Fourth Edition. — **DO NOT BUY THIS BOOK**; you can get a PDF version for free here: <https://www.openintro.org/book/os/>.

General Tips:

If you ever get an error message and do not know why or what it is trying to tell you, it is always a good strategy to enter the error message into Google. It is very likely that someone has had a similar problem. Doing so will very often bring you to [Stack Overflow](#), so you can also just start there if you want.

²Hadley Wickham is a statistician and the creator of the `ggplot2` package and the tidyverse. He's from New Zealand, hence the `.nz` in the links here and below.

³We won't be covering statistics or probability in much depth in this class, so this is only if you are interested.

Class Policies

Mask Policy

This semester, while we are in the midst of a global pandemic, all enrolled students are required to wear a mask covering your mouth and nose at all times in our classroom. This requirement is to protect our educational community — your classmates and me — as we learn together. If you choose not to wear a mask, or wear it improperly, I will ask you to leave immediately, and I will submit a report to the [Office of Student Conduct](#). At that point you will be disenrolled from this course for the protection of our educational community. Students who have an authorized accommodation from Accessibility Resources and Service have an exception. For additional information, see [Carolina Together](#).

Cooperation and Academic Integrity

In a class setting, cooperative work has both benefits and pitfalls. Peers learn a lot by explaining things to each other. But it can also be easy to stumble into a passive mindset where you're not really *assimilating* the concepts. To strike a balance, I will designate some activities and assignments (or parts thereof) as being Cooperative, and others as Individual. It is critical that you attend to this distinction, as completing individual work cooperatively would be a breach of academic integrity.

By its nature, this class has an extra matter we need to address. While discussion with other people is permitted and encouraged for work designated as cooperative, there is a distinction between discussing a problem and copying someone else's work. (Writing computer code is an especially tempting activity for which to copy work.) Students can discuss problem-solving strategies, clarify concepts, and point out mistakes—but ultimately each person must generate their own path to the solution. In our class, copying and pasting another person's computer code is potentially tantamount to plagiarism. **Even for work designated as cooperative, you must write your code individually.** Unless I have given you explicit permission for some special reason, do not do it. Copied code is surprisingly easy to detect (there is software designed to detect it).

Academic dishonesty—violating the standards of integrity all students pledge to adhere to as a condition of enrollment at UNC—results in being referred to the Honor Court. Students with questions about what qualifies as academic dishonesty should ask the instructor and can also consult the Honor Court Website at <http://honor.unc.edu>. Students may use any citation style they choose when writing papers so long as they remain consistent within any one paper.

Late Work Policy/Deadlines

If you think you may need an extension on any assignment, please do not hesitate to reach out. This is a stressful time; I do not want this class to add to your stress unnecessarily. The reason for an extension does not have to be a COVID-related; I will not

ask you to explain or to present any documents or anything. Please do try to let me know as far ahead as possible, purely for administrative purposes, but I recognize that this will not always be possible. I do want to caution that being behind on assignments makes it harder to work on the next assignments, so please take a look at the syllabus to see what work is coming up. It is still in your best interest to turn in assignments on time, as this class is fairly jam-packed with material (but spread out evenly over the course of the semester).

If you have not talked to me beforehand⁴, I will deduct half a letter grade (5 percentage points) per day that an assignment is late from the maximum grade you can receive. I will then grade your paper as normal and weight it so that it could not exceed this new maximum grade. As such, if you turn in an assignment two days late, the highest grade you can receive is a 90. If you then receive an 85 on the assignment, your actual grade will be $.85 * 90 = 76.5$.⁵ The reason I do this is because it makes it seem less arbitrary and helps me separate out where you lose points, in ways that are not related to the lateness of your assignment.

Contact Policy

You are encouraged to come to my office hours, listed above, and to contact me with any questions you may have, even if you just want to chat. I will make use of the scheduling system Calendly. Please use this link: https://calendly.com/poli281_sp21/office-hours to schedule office hours (link is also on Sakai page).

I am also available by appointment if you are unable to meet during the official office hours, but please do try to give me as much advance notice as possible. I really want to be a resource for you this semester, so if you have anything you want to talk about, please do not hesitate to come to my office hours. If I have to change my office hours for any reason, I will let you know.

My email is hoellers@unc.edu. I will try to respond as soon as possible, although I cannot guarantee same day response. Therefore, I encourage you to ask me questions about assignments and papers as far in advance as possible, which will hopefully help you get in the habit of working on assignments well before they are due.

However, *please limit your use of email to issues that are private, or at least specific to you*. For matters that are not private and where other students might want to see the response, please use Piazza. Note that Piazza permits anonymous posting (the post will be anonymous to other students, but not to me).

If you miss one or two classes, it could set you back significantly, or if you do not start working on the assignments soon enough, you may find yourself running out of time when the due date comes around. Please reach out to me if you have any issues, problems, or concerns. In addition, if anything or anyone makes you feel uncomfortable, and you feel

⁴AKA, please reach out if you need an extension, I cannot emphasize this enough.

⁵If I were not doing the weighting, you would get 75 (100 - 10 - 15). This format will always benefit you, even if only by a little.

comfortable doing so, please come talk to me so that I can do my best to assist you. Finally, **in line with university policy, I cannot discuss grades over email.** If you have questions about grades, you must come to office hours or set up an appointment.

I know that not all people are equally comfortable with or accustomed to asking for flexibility from instructors. This is why I make flexibility my official policy. I cannot emphasize enough to please just reach out if you need help.

Grade Grievances

Requests for regrades have a time window. They cannot be submitted until at least 48 hours have passed since the assignment was returned (a cool-down period), and then they will only be accepted within three weeks of an assignment being returned (a statute of limitations). To request a regrade, you must submit a written memo (two pages max) explaining what aspect of your original grade you think was in error.

Electronic Policy

Please put away all cell phones while class is in session. You are permitted to use laptops in class. On most days we will be doing some sort of activity for which you will *have* to use a computer.⁶ Please realize that I can tell when you are looking at materials that are not related to the class. When taking notes, I strongly encourage you to not use your laptops in class, as studies have shown that using pen and paper is better for comprehension and understanding, while laptop use can decrease participation.

Teaching Philosophy

I view my role as a teacher as a support person for you, my students. Because of my background and education, I have knowledge that I will strive to communicate with my you, which is why lectures do form an important part of this course. My primary goal as a teacher, however, is to make you feel engaged and active and to help you learn skills that you will be able to use outside of the contexts of this course and even of this field of study. As such, I believe that active engagement with the course material is essential to helping you learn, and I structure the course in such a way that there are plenty of ways in which to participate and be active, as I recognize that not all students learn in the same way. At the same time, I do not believe that surface-level skimming of a topic is all that useful; therefore, this class is more detail-oriented than other introductory courses may be, without being overwhelming. Finally, I am always open to feedback—I want to make sure that you are getting both what you want and need from this course.

I value the perspectives of individuals from all backgrounds reflecting the diversity of our students. I broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. I strive to make this classroom an inclusive space for all students. Please let me know if there is anything I can do to improve, I appreciate suggestions.

⁶If you do not have access to a laptop, please let me know as soon as possible, and we will find a solution.

Other Resources

Student Accessibility

Any student with a documented condition who needs to arrange reasonable accommodations should contact the instructor and Accessibility Resources (<https://accessibility.unc.edu/>). Accessibility Resources can be reached by phone at 919-962-8300 or by email at accessibility@unc.edu.

Counseling and Psychology Services (CAPS)

Being a student is stressful in and of itself, and almost all of us will face additional challenges on top of this. There is nothing wrong with seeking help whenever you need it. CAPS is strongly committed to addressing the mental health needs of a diverse student body through timely access to consultation and connection to clinically appropriate services, whether for short or long-term needs. Go to their website: <https://caps.unc.edu/> or visit their facilities on the third floor of the Campus Health Services building for a walk-in evaluation to learn more.

Title IX Resources

Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC at <https://eoc.unc.edu/report-an-incident/>. Please contact the University's Title IX Coordinator (Elizabeth Hall, interim – titleixcoordinator@unc.edu), Report and Response Coordinators in the Equal Opportunity and Compliance Office (reportandresponse@unc.edu), Counseling and Psychological Services (confidential), or the Gender Violence Services Coordinators (gvsc@unc.edu; confidential) to discuss your specific needs. Additional resources are available at <https://safe.unc.edu/>.

Learning Center

The UNC Learning Center is a great resource both for students who are struggling in their courses and for those who want to be proactive and develop sound study practices to prevent falling behind. They offer individual consultations, peer tutoring, academic coaching, test prep programming, study skills workshops, and peer study groups. If you think you might benefit from their services, please visit them in SASB North or visit their website to set up an appointment: <http://learningcenter.unc.edu>.

Writing Center

The Writing Center is located in the Student and Academic Services Building and offers personalized writing consultations as well as a variety of other resources. This could be a wonderful resource to help with your writing assignments in this course (and any assignments in your other courses). You do not need a complete draft of your assignment to visit; they

can help you at any stage! You can chat with someone in the writing center or set up an appointment on their website: <http://writingcenter.unc.edu>.

Disclaimer

I reserve the right to make any and all necessary changes to this syllabus. If I do make any changes, I will of course inform you about them. Please always refer to the most updated syllabus, which I will upload to the course Sakai page under “Syllabus,” when seeking information.

Course Schedule

Week	Date	Lecture Topic	Readings	Assignments
1 Th	8/19	Course Introduction	<ul style="list-style-type: none"> • Lohr 2009 • Vance 2009 • Rogers Cook 2019 	<ul style="list-style-type: none"> • Register for Poll Everywhere
2 Tu	8/24	The Possibilities and Perils of Data Science	<ul style="list-style-type: none"> • Christensen et al. 2019, Introduction • How Eugenics Shaped Statistics 	<ul style="list-style-type: none"> • Register for Piazza • Complete “Getting to Know You” Google Poll
2 Th	8/26	R: Getting Set Up I	<ul style="list-style-type: none"> • ModernDive Ch. 1 sections 1.1 & 1.3 (Getting Started with Data in R) 	<ul style="list-style-type: none"> • Register for DataCamp • Download and install both R and RStudio
3 Tu	8/31	R: Getting Set Up II	<ul style="list-style-type: none"> • Skim QSS, Ch. 1 	
3 Th	9/2	R: Basic Tools I		<ul style="list-style-type: none"> • DataCamp: Introduction to R, Ch. 1-3
4 Tu	9/7	R: Basic Tools II		<ul style="list-style-type: none"> • DataCamp: Introduction to R, Ch. 4-6
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Calendar – continued from previous page				
Week	Date	Lecture Topic	Readings	Assignments
4 Th	9/9	R: Intermediate Tools I		<ul style="list-style-type: none"> • DataCamp: Intermediate R, Ch. 1 (Conditionals) • DataCamp: Reporting with R Markdown, Ch. 1 (Getting Started with R Markdown)
5 Tu	9/14	R: Intermediate Tools II		<ul style="list-style-type: none"> • DataCamp: Intermediate R, Ch. 2 (Loops) • Homework 1 due
5 Th	9/16	R: Intermediate Tools III		<ul style="list-style-type: none"> • DataCamp: Intermediate R, Ch. 3 (Functions)
6 Tu	9/21	R: Wrap-Up	<ul style="list-style-type: none"> • <u>Read QSS</u>, Ch. 1 	<ul style="list-style-type: none"> • <i>Optional but recommended (will get bonus point):</i> DataCamp: Intermediate R, Ch. 4 (The apply family)
6 Th	9/23	Causality I	<ul style="list-style-type: none"> • Bertrand & Mullainathan, pp. 991-997 (Sakai) • <i>QSS</i>, pp. 32-48 	<ul style="list-style-type: none"> • Homework 2 due
7 Tu	9/28	Causality II	<ul style="list-style-type: none"> • Gerber et al., pp. 33-38 (Sakai) • <i>QSS</i>, pp. 48-54 	
7 Th	9/30	Causality III	<ul style="list-style-type: none"> • Card & Krueger, pp. 772-778 (Sakai) • <i>QSS</i>, pp. 54-69 	
8 Tu	10/5	Causality IV	<ul style="list-style-type: none"> • Mosteller, entire (Sakai) 	
8 Th	10/7	Causality V		<ul style="list-style-type: none"> • Final Project proposal due
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Calendar – continued from previous page					
Week	Date	Lecture Topic	Readings	Assignments	
9 Tu	10/12	Causality Workshop	<ul style="list-style-type: none"> Look at reading assignments in activity description document 	<ul style="list-style-type: none"> Answer reading questions for assigned article 	
9 Th	10/14	Data Visualization I		<ul style="list-style-type: none"> DataCamp: Introduction to the Tidyverse, Ch. 1-4 Homework 3 due 	
10 Tu	10/19	Data Visualization II		<ul style="list-style-type: none"> DataCamp: Reporting with R Markdown, Ch. 2 (Adding Analyses and Visualizations) 	
10 Th	10/21	No class, No office hours (Fall Break)			
11 Tu	10/26	Data Visualization III	<ul style="list-style-type: none"> 538's Weirdest and Best Charts of 2020 		
11 Th	10/28	Measurement I	<ul style="list-style-type: none"> <i>QSS</i>, pp. 75-111 		
12 Tu	11/2	Measurement II	<ul style="list-style-type: none"> <i>QSS</i>, pp. 123-139 		
12 Th	11/4	Prediction I	<ul style="list-style-type: none"> <i>QSS</i>, pp. 139-148 	<ul style="list-style-type: none"> Homework 4 due 	
13 Tu	11/9	Prediction II	<ul style="list-style-type: none"> <i>QSS</i>, pp. 148-161 		
13 Th	11/11	Prediction III	<ul style="list-style-type: none"> <i>QSS</i>, pp. 161-170 	<ul style="list-style-type: none"> Final Project preliminary analysis due 	
14 Tu	11/16	Prediction IV	<ul style="list-style-type: none"> TBD 		
14 Th	11/18	In-class Final Project Workshopping			
15 Tu	11/23	In-class Final Project Workshopping			<ul style="list-style-type: none"> Homework 5 due
15 Th	11/25	No class (Thanksgiving Recess)			
16 Tu	11/30	In-class Final Project Workshopping			

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Calendar – continued from previous page				
Week	Date	Lecture Topic	Readings	Assignments
Final	12/10, 4pm	Final Project Presentations		• Final Projects due
