Political Science Research Methods[*]

PSCI 3300

Spring 2026

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Class meeting: Mondays and Wednesdays, 2:00-3:20pm, 117 Wooten Hall

Instructor office hours: Mondays and Wednesdays, 1:00-1:50pm, 160 Wooten Hall, or by appointment

Teaching assistant: Morgan Poe

TA office hours: TBD

Course description

The primary goal of this class is to introduce students to various methodological approaches used in political science. Quantitative and statistical analyses of political events have become abundant in recent years, and data-driven approaches to such events have directed research in social sciences. Throughout the course, students are expected learn how to 1) interpret political concepts and topics using a quantitative lens; 2) assess different data types and structures using a programing language R; 3) discover new patterns and make critical inferences of key political events; and 4) improve familiarity and assessment of available data analysis in present-day mass and social media. We will mainly use *political* data that measure country-level differences in regime types, levels of democracy and economic indicators as well as individual-level variables for political ideology, participation, and related behaviors.

Assessment

Students are required to attend classes, read the course materials, participate in in-class workshops, and complete assigned materials. The final grade will be composed as follows: class participation 15%, problem sets 30%, mid-term quizzes 20%, final quiz 20 %, and final research proposal 15%. Detailed descriptions of the assessment are as follows:

Grades will be posted on the Canvas course website, but students should interpret the grades based on the proportions provided below, because the calculated grades often do not fully incorporate the varied weights placed on each assignment.

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[*] This syllabus is subject to change.

In-class participation (15%)		15%
Problem sets (30%)		30%
Mid-term quiz (10%) X2		20%
Final quiz (20%)		20%
Group research presentation (15%)	Proposal (5%)	5%
	Research presentation (10%)	10%
Total		**100%**

Participation (15%):

Class participation (13%) Students are expected to attend regular classes, read carefully the assigned materials prior to class; and participate actively in the discussion of these materials. Your active participation will serve as a starting point for an active discussion, contribute to create a seminar-like environment where you feel comfortable both talking in front of an audience and asking questions, and help you engage thoughtfully with the readings. In addition, since this course includes workshop sessions using R, your participation and exploration of in-class materials also count toward your participation grades. Throughout the semester, I will distribute some pop quizzes without a prior notice which will count towards part of your participation grades.

Syllabus quiz (2%) I will distribute a short quiz about this syllabus in the first week of the semester. The main goal of this quiz is to help you fully grasp key components of this course.

Problem Sets (30%):

In every week, students will submit a data analysis assignment. The instructor will distribute the assignment material in both an R Markdown format and a pdf document that include descriptions of the lecture topics and assignment questions. Students then submit their answers to the questions in a knitted file format using R Studio. (I will discuss this in class.) Students can work in a group to complete the assignment, and a group of up to three can submit weekly assignment together. When they work in a group, students need to turn in their names and a summary of each member's contribution to the assignment. The assignment is due at **11:59pm on every Friday**.

There will be **eleven problem sets** throughout the semester, and responses with the lowest two grades will be dropped. Each response will count towards 3.3% of the final grades (3.3%X9=30%).

Two Quizzes (10% each) and a Final Exam (20%):

There will be three in-class exams including a midterm quiz, a coding quiz, and a cumulative final exam. No makeup or rescheduled exams will be given except for most extreme and unusual circumstances (not for, say, illness or transportation problem). Each exam should be completed within the regular class time of 80 minutes. The instructor has the discretion to decide whether and when a makeup exam will be granted. No collaboration is permitted during the exams. However,

students are allowed to use **a single page letter-sized sheet of hand-written notes** (one-sided, should be approved by the instructor before the exam).

Student research project (15%):

In this assignment, you will design your own research project by incorporating key components you learn throughout the course. It is a group assignment, and you will work with 2-3 other group members on a single research project. All members of the same group will receive the same grade for the three different parts of the assignment. Students can create their own groups with peers or will be assigned to groups based on their research interests.

Research proposal (5%) – Students will submit a short research proposal that includes a research question, a rationale for study, and importance of the study. It should be around 400 words in length (double spaced). The proposal should answer the following key questions:

1. Research question: Which real-world cases are you discussing in your paper? Why is that variation inherently important?

2. Related studies: How do some of the previous studies discuss your research question? What is missing from the studies and how will you fill this gap?

3. Data and variables: Where will you draw your dataset? What are your main variables and how are they measured? What method(s) does your paper use to test the main argument? Is the method appropriate in answering the research question? How do some of the key variables look like?

4. Conclusion: What do you expect to find in your paper? How much better can we understand a particular real-world phenomenon after reading your work than before?

Group presentation (10%) Students will develop a research paper throughout the semester, by completing different sections of a research project over the semester. The main objective of this assignment is helping students to transition a real-world phenomenon into a research project, using key concepts discussed in class. Students will present the introduction, literature review, and empirical analysis at the end of the semester. Each section should include the following components:

- Introduction: Students introduce a research question, a rationale for study, and importance of the study.
- Literature review/argument: Students discuss a short review of 2-3 academic articles related to their research question. The summary should be structured in a way that support the main argument of the paper.
- Empirical analysis: Students locate, clean, and summarize a dataset that they use for the empirical analysis. This section should explain what kind of data students are using and how they will analyze them. It also needs to provide some empirical results with substantive interpretation.

Students should combine the three components together and give a research presentation to the class at the end of the semester. Each presentation should last around 10 minutes, covering all necessary components of a research project. Students can opt for creating a 5-7 minute video clip

that includes the three components. Students can revise and update the three sections based on instructor's comments from the research proposal. More detailed instructions for the final presentation will be distributed mid-semester.

Use of Electronics. Students should bring their laptop or other electronic devices that can operate the software R and R Studio. You should use your laptops for class purposes only. **Use of cell phones in class is strictly prohibited**; please turn off or silence your phones. If you have an emergency and must make a call, please leave the classroom quietly. If your use of electronics becomes disruptive or is used for purposes other than taking notes, you will be asked to leave the classroom.

Late Policy. You will lose points if you submit your assignment late. A letter grade will be deducted for each day you submit your assignment late. For example, if you submit your assignment two days later the deadline, the highest grade possible will be C.

Grade scale

Grade	%
A	89.50 - 100
B	79.50 - 89.49
C	69.50 - 79.49
D	60.00 - 69.49
F	59.99 and below

Assignment format

All assignments based on R should be submitted in an html or pdf format along with an rmd file (if the html or pdf files are generated from an rmd file) and a data set file. For some assignments, students can submit a Word document (.doc or .docx). For Word documents, the font should be 12 points in size and either Aptos/Calibri (basic Word font) or Times New Roman.

There is no required citation style for your final paper, but APA style is recommended. Please check this UNT Libraries website for more information.

Guidelines for using Artificial Intelligence tools

Artificial Intelligence (AI) tools have become more accessible in recent years and can generate outcomes that comparable to human-generated ones. While I value the advance in AI tools, using such tools should be strictly limited to the following purposes: **correcting grammatical errors in your writing and receiving assistance in finding key resources for your paper.** One of key purposes of this course is helping you to become an independent scholar, which is focused on developing your skills in conducting critical thinking, coming up with creative research arguments,

and implementing empirical analysis that can support your argument. I believe communicating with your advisors and colleagues is more valuable in this process than relying on machine-generated answers.

If you use any of the available AI-assisted tools, please cite them properly in your paper. For example, if you use them to improve your writing grammatically or find resources for your paper, please indicate it in text using a footnote. But if you can find the original resources instead of the AI-generated text, please refer to the original text, read it properly, and include it in your paper. Any part of the paper that is detected as AI-generated is susceptible to deductions to your final grades.

Course schedule and assigned reading (subject to change as semester progresses)[†]

There is one required textbook for purchase in this course. And we also have required statistical softwares that we will use for actual data analysis. All additional reading materials are accessible through the links below and the UNT library website.

- Required Textbook: Elena Llaudet and Kosuke Imai. 2022. *Data Analysis for Social Science* (DSS). Princeton University Press.
- Required Statistical Softwares: R (www.r-project.org) and RStudio (www.rstudio.com).
- Useful R resources: R Cookbook (https://rc2e.com/gettingstarted#intro-GettingStarted) – it's free and good for beginners.

	Date	#	Topic	DSS Chs	Key concepts	PSet
M	1/12	1-1	Course Introduction			
W	1/14	1-2	Introduction to R and R Studio	1-1.6	Basic calculations, objects, functions	#0
M	1/19	2-1	MLK Day (No class)			
W	1/21	2-2	Observations and Variables	1.7	Data frames, observations, variables, unit of observation; R: dim(), str(), table()	#1
M	1/26	3-1	Computing and Interpreting Means, comparing means	1.8	mean or average, unit of measurement; R: mean(); final paper: Initial research question	
W	1/28	3-2	Estimating Causal Effects with Randomized Experiments	2-2.4	causal relationships	#2
M	2/2	4-1	Does Social Pressure Increase the Probability to Vote?	2.5-2.7	Subsetting variables, R: ==, ifelse(), []; final paper: Creating your own survey and measures	
W	2/4	4-2	Survey Research and Exploring One Variable at a Time	3-3.4.4	Survey sampling, measurement, frequency table, table of proportions; R: table(), prop.table()	#3
M	2/9	5-1	Exploring the relationship between two variables	3.4.5	two-way frequency table, table of proportions, histograms, descriptive stats; R: median(), sd(), hist()	
W	2/11	5-2	Exploring the relationship between two variables	3.5-3.7	standard deviation, scatter plot, correlation; R: plot(), cor();	#4
M	2/16	6-1	Locating and loading data, review		Download and load a data set on your PC; R: read.csv(), read.table(), stargazer()	

[†] The current schedule is based on the Spring 26 academic calendar.

	Date	Unit	Topic	Ch.	Content	#
W	2/18	6-2	**CODING QUIZ**			
M	2/23	7-1	Intro to ggplot()		R: ggplot(), geom_point(), geom_bar()	
W	2/25	7-2	Visualizing data with ggplot()		R: ggplot(), scale_color_manual()	#5
M	3/2	8-1	Predicting outcomes using linear regression	4-4.4.1	basic concepts, intercept and slope, error term, least squares method; R: lm(), coef(), abline()	
W	3/4	8-2	Predicting outcomes using linear regression	4.6-4.9	OLS, estimation v. prediction, examples, R squared; R: predict(). **Research proposal due (3/6)**	#6
	3/9, 3/11		Spring break (No class)			
M	3/16	9-1	Application to your research project		Loading a real-world dataset, conducting data analysis	
W	3/18	9-2	Application to your research project		Summarizing descriptive data, reviewing literature	#7
M	3/23	10-1	Review		Coding review; Final paper.	
W	3/25	10-2	**MIDTERM QUIZ**			
M	3/30	11-1	Multivariate regression models	5-5.3.1	observation v. experiments, confounding variables, directed acyclic graphs (DAGs); R: subset()	
W	4/1	11-2	Controlling for Confounders	5.3.2-5.4.2	bivariate v. multivariate regression models	#8
M	4/6	12-1	Probability	6-6.4.3	basic probability, Bernoulli distribution, the Normal distribution; R: sample()	
W	4/8	12-2	Probability	6.5-6.6	population v. sample parameters, LLN, CLT; R: pnorm() **Presentations #1-#3**	#9
M	4/13	13-1	Accounting for uncertainty	7-7.2	confidence interval for the sample mean, for difference-in-means-estimator	
W	4/15	13-2	Accounting for uncertainty	7.3-7.5	CI predicted outcomes, p-values, hypothesis testing **Presentations #4-#6**	#10
M	4/20	14-1	Presentations		**Presentations #7-#12**	
W	4/22	14-2	Conference travel (No class)		Data location assignment due.	
M	4/27	15-1	Hypothesis testing		Hypothesis testing with permutation method; final paper: Writing an effective introduction	

| W | 4/29 | 15-2 | Hypothesis testing | Accounting for uncertainty with bootstrapping; | #11 |
| M | 5/4 | 16-1 | **FINAL QUIZ** | | |

Course and University Policies

Academic Integrity Standards and Consequences

According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

ADA Accommodation Statement

UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at anytime, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website at disability.unt.edu.

Emergency Notification & Procedures

UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to the UNT Learning Management System (LMS) for contingency plans for covering course materials.

Acceptable Student Behavior

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at deanofstudents.unt.edu/conduct.

Survivor Advocacy

UNT is committed to providing a safe learning environment free of all forms of sexual misconduct, including sexual harassment sexual assault, domestic violence, dating violence, and stalking. Federal laws (Title IX and the Violence Against Women Act) and UNT policies prohibit discrimination on the basis of sex, and therefore prohibit sexual misconduct. If you or someone you know is experiencing sexual harassment, relationship violence, stalking, and/or sexual assault,

there are campus resources available to provide support and assistance. UNT's Survivor Advocates can assist a student who has been impacted by violence by filing protective orders, completing crime victim's compensation applications, contacting professors for absences related to an assault, working with housing to facilitate a room change where appropriate, and connecting students to other resources available both on and off campus. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-565-2648. Additionally, alleged sexual misconduct can be non-confidentially reported to the Title IX Coordinator at oeo@unt.edu or at (940) 565 2759.

Course Policy on Academic Integrity, Plagiarism, Cheating, and Generative AI/Chatbots

This policy pertains to *all* assignments in this course that require writing. That includes – but is not limited to – papers and examinations. All written work you submit in this course must be your own, original work.

What does that mean?

- You give appropriate credit to each and every source, and do so each and every time you use that source, irrespective of whether you paraphrase or quote that source. Failure to give appropriate credit means you present the work as your own.

- You do not use any material written by someone else or by generative AI – including, but not limited to chatbots such as ChatGPT – and present it as your own work.

Why?

- According to the UNT Academic Integrity Policy (UNT Policy 6.003), any form of "unauthorized assistance" constitutes cheating. As a result, use of any artificial intelligence is not authorized for completion of assignments or exams in this course, unless specifically authorized by the instructor.

- Academic integrity is defined in UNT Policy 6.003 and indicates that the following constitute violations of academic honesty: a student has another person/entity do the work of any substantive portion of a graded assignment for them, which includes purchasing work from a company, hiring a person or company to complete an assignment or exam, and/or using generative AI tools (such as ChatGPT).

- For additional information, consult UNT Policy 6.003.

What are the consequences?

- Violations will not be tolerated. Any suspected case of academic dishonesty will be handled in accordance with current University policy and procedures, as described at https://vpaa.unt.edu/ss/integrity.
    - If this is your first academic integrity violation, you can expect a failing grade on the assignment, and you will be reported to the university's Academic Integrity office.
    - Repeat violations will lead to stronger sanctions up to and including expulsion from UNT.

- These penalties will apply even if you did not knowingly intend to plagiarize or cheat. You must familiarize yourself with the rules of academic integrity and do your own original work – whether at UNT or later in your career – and ignorance is no excuse.