

PLS211

Quantitative Methods in Political Science

Spring 2023 | MWF 10:00-10:50 | Room#: 8.422A

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Course Description

This course is one of the methodology requirements for PSIR majors.

The use of statistics is very common in political science, from simple descriptions of political phenomena to predictions of election winners, foreign policy strategies, chances of terrorist attacks, and so on. This course is designed to acquaint students with statistical concepts and skills so that they can produce as well as consume materials of quantitative analyses. Students will learn how to think (observe, analyze and interpret) in terms of statistical models and how to apply such thinking to social problems.

Course Expectations

It is highly recommended that students should take PLS210 before this course. Students are expected to have knowledge of basic algebra (calculus is plus, but not necessary). Students will learn and use statistical packages (mostly R), but no prior experience or knowledge of computer programming is expected. Students are expected to follow instructions and meet the deadlines for fair and appropriate assessments.

Course Learning Objectives

By the end of this course, students will be able to:

- describe and interpret basic quantitative data and evidence (PLO 1 & 2)
- present their ideas and information in an appropriate format (PLO 3)
- develop a research question in and answer it using appropriate source (PLO 1,2,3 & 4)
- make their own evidence-based arguments (PLO 1 & 2)
- listen to and be tolerant of different ideas (PLO 5)

Textbook and R

QSS This course uses multiple sources for vitalizing the learning progress. This course takes the approach of quantitative social science by Kosuke Imai.

- Imai, Kosuke. (2017) *Qualitative Social Science: An Introduction*, Princeton University Press (ISBN: 9780691167039).

R Students are required to complete and submit assignments using R, a statistical package. R is free (available at the R project homepage). The computers in the lab (8.422A) already have R and R Studios. However, if you want to use them on your personal device, visit the website for downloading and installing.

- [R project homepage](#)
- [R Studio download](#)

You need to install R on your computer before installing R Studio. For R Studio, choose the 'free' version.

Course Requirements

Exams (20+20+20%) There will be three non-cumulative exams throughout the course on weeks 6, 10, and 15. Each exam is 20% of the final grade. Exam questions include multiple choices and short answers. You can use an unconnected calculator during the exam.

R exercise assignments (30%) There will be R exercise assignments, in which students solve problems using R packages. Sample problems will be discussed on Fridays.

Attendance (10%) Cheating or attempting to cheat on attendance will be reported as academic misconduct. If a student misses more than $\frac{1}{3}$ of the class, a failing grade (F) will be granted.

Grading Policy

Final grade The final grade is determined by the student's overall performance of all course requirements. The final score is a weighted sum of each assessment and will be rounded to the first decimal point (not to ones). All assessments should be completed before the final grade is due. No extra assignments are allowed after the submission of the final assignment (i.e. final draft of your research paper). Your final grade is non-negotiable. Unless there is a computational error, changes to the final grade will not be made. Only under exceptional circumstances (e.g. a long-term hospitalization) a grade of incomplete (I) may be granted. Following the NU grade policy, the final letter grade will be given as follows:

Exam 1	(20%)			A	>95.0	A-	90.0-94.9
Exam 2	(20%)	B+	85.0-89.9	B	80.0-84.9	B-	75.0-79.9
Exam 3	(20%)	C+	70.0-74.9	C	65.0-69.9	C-	60.0-64.9
R exercises	(30%)	D+	55.0-59.9	D	50.0-54.9		
Attendance	(10%)	F	<50.0				

Late submission I do not accept late submissions under any circumstances. Missing a deadline is equally treated as a missed assessment (see below).

Plagiarism/cheating This will never be tolerated. Students must be familiarized with the NU Student Code of Conduct and the university regulations about academic misconduct. See the *Academic Misconduct* section for details.

Re-grading Students can request regrading of their assignments *within one week* after it is graded. Such a request must be made in written form and submitted to the professor's email with a full description of the reasons for the request. Note that the entire requested assignment, not a specific part(s), will be re-graded and that the new grade may be lower than the original one. There will be no re-grading of re-graded assignments.

Missed assessments Students are responsible for all course assignments and assessments outlined in the syllabus, even if they have a legitimate excuse (i.e. medical emergency). Students who know they will miss a deadline for an assignment or an assessment, even if it is a School or University activity, must contact the professor before the deadline. If this is not possible, the professor must be contacted within 24 hours. Students must provide legitimate and substantial documentation legitimately explaining their missing deadlines (*a simple spravka will not be accepted*). If a student fails to do so, the student may receive a zero for the assessment.

Extension There will be no extension of deadlines for any assignments on an individual basis. If circumstances are so dire as for a student to meet the deadline, the student must contact the professor before the deadline with substantial documentation (again, a simple spravka will not be accepted).

Academic Misconduct

Official documents Zero tolerance is applied to any academic misconduct, including cheating, fraud, plagiarism. Read the NU Student Code of Conduct and Disciplinary Procedures carefully. Here are the key documents of NU on academic misconduct:

- Academic policies and procedures for undergraduate programs
- Student code of conduct and disciplinary procedures
- Undergraduate attendance policy and procedures

Plagiarism Plagiarism is defined as “an act of using someone else’s ideas or words as if they were your own without appropriate acknowledgment or quotation marks.” Depending on the seriousness of this type of misconduct, this course enforces three categories as follows. This applies to all your written assignments and assessments:

- Category A (minor plagiarism): two or more sentences per question
- Category B (major plagiarism): more one suspected answers with Category A plagiarism

Cheating Any suspicious acts or attempts during an exam will be reported for academic misconduct (Category A). All exams in this course are in closed-book written formats. Only pre-approved devices (e.g. calculators) are allowed. Simple possession of unauthorized devices during exam hours is also considered the same as cheating.

Penalties Academic dishonesty and misconduct in this course will be penalized by *a course failure* (F for final grade), *regardless of* categories or types of misconduct.

Important notes Students often misunderstand the rules of academic misconduct and the procedure. Here are some common misunderstandings:

- The similarity score of turn-it-in is just an assisting tool, not a determining indicator of plagiarism. The instructor manually examines a student’s writings and decides to report the case for academic misconduct.
- Penalties are decided by the course policy, not by students or the NU Student Code of Conduct. The penalties per category in the Student Code of Conduct are just examples (read Article 18 on page 8).
- All students involved in misconduct will be subject to disciplinary actions and misconduct penalties. For example, both students who shared and copied an assignment will be punished.
- If a misconduct report is submitted, the instructor may or may not meet with the student. There is no obligation for the instructor to discuss the action with the student before or after the report.
- An attempt to cheat also constitutes academic misconduct, regardless of the actual implementation of such plans.
- If a student has a previous misconduct case, the Disciplinary Committee will automatically raise the category of misconduct and/or the penalty.

Other Policies

Attendance If a student misses more than $\frac{1}{3}$, either excused or unexcused, a failing grade (F for the final grade) will be automatically assigned.

Assistance for physical/mental needs If a student needs special attention due to his/her own physical or mental conditions, the student is responsible for notifying the instructor at the beginning of the semester. If necessary, the instructor can demand official documentation on the student's condition. Upon such requests, the student should provide appropriate records/proof of the condition. If not provided, the requests may not be considered or processed.

Non-academic misconduct A student's behavior that may endanger or significantly impair the usual conduct of University-authorized activities (e.g. lectures, assessments, in-class discussions, other students' study) is subject to nonacademic misconduct. Act wisely and responsibly in and outside classrooms. See chapter 3 of the Student Code of Conduct for details.

Communications The best way to communicate with the instructor is by email (Moodle messages not reliable). Your email will usually be answered within 24 hours. My door is always open for students during designated office hours. Students can also set up an appointment via email for a meeting during non-office hours.

Changes to syllabus The instructor reserves the right to make changes to the syllabus. Any changes will be communicated in class and via Moodle.

Course Schedule and Readings

Week 1. Introduction

- Quantitative methods
- Read Imai, Chapter 1 and the course syllabus

Weeks 2. Causality

- Causal effects and counterfactual; experimental vs. observational studies; quantiles and standard deviations
- Read Imai, Chapter 2
- Exercise from Salganik, Matthew J., Peter Sheridan Dodds and Duncan J. Watts. 2006. "[Experimental Study of Inequality and Unpredictability in an Artificial Cultural Market.](#)" *Science* 311(5762): 854-856.

Weeks 3. Measurement (1)

- Measurement errors and validity; visualizing univariate distribution
- Read Imai, Chapters 3.1 to 3.5
- Exercise from Jones, Benjamin F, and Benjamin A Olken. 2009. "[Hit or Miss? The Effect of Assassinations on Institutions and War.](#)" *American Economic Journal: Macroeconomics* 1(2): 55-87.

Weeks 4. Measurement (2)

- Correlation; QQ plot; clustering; *k*-means
- Read Imai, Chapters 3.6 to 3.8
- Exercise from Pierotti, Rachel. (2013). "[Increasing Rejection of Intimate Partner Violence: Evidence of Global Cultural Diffusion.](#)" *American Sociological Review*, 78: 240-265.

Week 5. Prediction (1)

- Predicting with data
- Read Imai, Chapter 4.1
- Exercise from Stefano DellaVigna and Ethan Kaplan (2007). "[The Fox News Effect: Media Bias and Voting.](#)" *Quarterly Journal of Economics*, 122(3): 1187-1234.

Week 6. Prediction (2)

- Linear regression (least squares; regression towards the mean; model fit)
- Read Imai, Chapter 4.2
- Exam 1 on Friday (Chapters 1 through 4.2)

Week 7. Prediction (3)

- Regression and causation (multiple predictors; heterogeneous treatment effects; regression discontinuity design)
- Read Imai, Chapter 4.3
- Exercise from Brollo, Fernanda, et al. (2013) [“The political resource curse.”](#) *The American Economic Review* 103(5): 1759-1796.

Weeks 8. Probability (1)

- Probability and conditional probability
- Read Imai, Chapters 6.1 & 6.2
- Exercise from Arturas Rozenas (2017) [“Detecting election fraud from irregularities in vote-share distributions”](#) *Political Analysis* 25(1): 41-56.

Week 9. Probability (2)

- Random variables and probability distributions
- Read Imai, Chapter 6.3
- Exercise from Arturas Rozenas (2017) [“Detecting election fraud from irregularities in vote-share distributions”](#) *Political Analysis* 25(1): 41-56.

Week 10. Probability (3)

- Large sample theorems
- Read Imai, Chapter 6.4
- Exam 2 on Friday (Chapters 4.3 through 6.4)

Week 11. Spring break

- No class

Week 12. Uncertainty (1)

- Estimation concepts (unbiasedness; consistency; standard error; confidence intervals; margin of error; student's *t*-distribution)
- Read Imai, Chapter 7.1
- Exercise from Stokes, Leah C. (2016). [“Electoral Backlash against Climate Policy: A Natural Experiment on Retrospective Voting and Local Resistance to Public Policy Authors”](#) *American Journal of Political Science* 60(4): 958-974.

Week 13. Uncertainty (2)

- Hypothesis testing (one-sample tests; two-sample tests; power analysis)
- Read Imai, Chapter 7.2
- Exercise from Gary King, Ori Rosen, Martin Tanner, and Alexander F. Wagner (2008) "[Ordinary Economic Voting Behavior in the Extraordinary Election of Adolf Hitler](#)" *Journal of Economic History* 68(4): 951-996.

Week 14. Uncertainty (3)

- LM as a general model; inference about coefficients
- Read Imai, Chapter 7.3
- Exercise from Ross, Michael (2006), "[Is Democracy Good for the Poor](#)", *American Journal of Political Science* 50(4): 860-874.

Week 15. Uncertainty (4)

- Practical issues of data analysis
- Read Imai, Chapter 7.4
- **Exam 3 on Friday (Chapters 7.1 through 7.4)**

--- End of syllabus ---