POLSCI 300: Quantitative Empirical Methods of Political Science

Spring 2019

Class Time: M, T, W, Th (2:00-4:00)
Class Location: 2330 MH
Office Hours: M, T (12:00-1:00)
Office: ISR, 426 Thompson Street, 4th Floor
Email: talibova@umich.edu

- Signup sheet (24 hours in advance): https://doodle.com/poll/dypnbd6zrtii2ddv

This course is intended to introduce students to the methods political scientists use to construct, to estimate, and to evaluate systematically empirical representations of theoretical propositions about politics. The class will focus on programming, hands-on empirical analysis, and conceptual discussion of the role of research designs. Although an introductory statistics course, it will be a heavily applied class with abundance of empirical examples. By the end of the class, students should be able to understand and discuss a lot of statistical concepts and program in the statistical software $\mathcal{R}$. No background in programming or statistics is required. Problem sets, class participation, mid-term and final take-home exams comprise the course's graded exercises. Lecture notes and other course materials will be provided before class sessions, with the expectation that students have read all the assigned materials before class sessions.

The class will be divided into two alternating sections. The first two sections of each week will cover the core theoretical and empirical concepts in political methodology. These will be followed by a hands-on programming exercise analyzing existing data.

Course Grading

Your grade in class will be determined by a weighted average of your performance on a set of problem sets throughout the course, as well as your attendance and participation. There will be eight (roughly weekly) problem sets. The last problem set will be optional. All problem sets will contain a combination of programming, analytical, conceptual, and data analysis questions. There will be two midterm exams: one in-class midterm exam, and a take-home final exam. The midterm exam is in-class, on Thursday June 6; you must bring a blue book to class on this date. The final exam is take home, starting on Tuesday, June 25 and ending on Thursday, June 27; submission of the final must be done electronically on the class' Canvas website.

Grade Distribution:

Attendance	5%
Participation	5%
Problem sets	40%
Midterm Exam	20%
Final Exam	30%

Participation: One of the best ways to build your understanding of new material is to actively discuss and work out the answers yourselves. I expect everyone to contribute to discussion on a regular basis. If you feel that you cannot actively participate, see me as soon as possible to make alternative arrangements.

Attendance: Attendance in this course is mandatory. In order to effectively participate, it is essential that you attend class meetings. You are responsible for any material you missed due to an unexcused absence; office hours do not replace sections missed due to unexcused absences. A note from a doctor or some other person of authority (documenting a family emergency or medical attention for an illness) is required for an excused absence. You will lose 1/5 of your attendance grade for each unexcused absence. Students with family responsibilities, athletic commitments, or religious conflicts should discuss those with me before missing class.

Communication: The best way to get in touch with me is by signing up for office hours. My office hours will be held on Mondays and Tuesdays between 12:00-1:00 at the Institute for Social Research (426 Thompson Street, 4th floor). I strongly suggest you take advantage of these times to ask clarification questions, get feedback, prepare for problem sets and exams, or just to chat. If you cannot make office hours due to a time conflict or another unavoidable circumstance, contact me about setting up an appointment. I will do my best to accommodate.

Technology in the classroom: You are strongly encouraged to bring laptops to class. Answering your cell phone or texting during class is disrespectful to your classmates and the instructor. Please turn your phone off during class time.

Special Accommodations: If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way the course is usually taught may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the *Services for Students with Disabilities (SSD)* office to help us determine appropriate academic accommodations. SSD (734-763-3000; http://ssd.umich.edu) typically recommends accommodations through a *Verified Individualized Services and Accommodations (VISA)* form. Any information you provide is private and confidential and will be treated as such.

Academic Honesty: The LSA academic community, like all communities, functions best when its members treat one another with honesty, fairness, respect, and trust. The College holds all members of its community to high standards of scholarship and integrity. To accomplish its mission of providing an optimal educational environment and developing leaders of society, the College promotes the assumption of personal responsibility and integrity and prohibits all forms of academic dishonesty and misconduct. Academic dishonesty may be understood as any action or attempted action that may result in creating an unfair academic advantage for oneself or an unfair academic advantage or disadvantage for any other

member or members of the academic community. Conduct, without regard to motive, that violates the academic integrity and ethical standards of the College community cannot be tolerated. The College seeks vigorously to achieve compliance with its community standards of academic integrity. Violations of the standards will not be tolerated and will result in serious consequences and disciplinary action. See examples of academic misconduct.

Student Mental Health and Wellbeing: The University of Michigan is committed to advancing the mental health and wellbeing of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact *Counseling and Psychological Services (CAPS)* at (734) 764-8312 and https://caps.umich.edu/ during and after hours, on weekends and holidays, or through its counselors physically located in schools on both North and Central Campus. You may also consult *University Health Service (UHS)* at (734) 764-8320 and https://www.uhs.umich.edu/mentalhealthsvcs, or for alcohol or drug concerns, see www.uhs.umich.edu/aodresources. For a listing of other mental health resources available on and off campus, visit: http://umich.edu/health-medicine and http://umich.edu/~mhealth.

Grade Grievances
If you believe a grade you have received is unfair or in error, you will need to do the following:

- Wait 24 hours after receiving the grade before approaching me.
- Provide an explanation in writing for why the grade you received was unfair or in error. You should provide evidence in support of your appeal from course materials.
- The instructor will review your appeal and, if a regrade is granted, review the relevant area of the assessment again. The revised grade will be entered in your final course grade.
- If you believe the primary instructor's response fails to address your claim of unfairness or error, you may petition the department's Director of Undergraduate Studies at the latest within the first five weeks of classes following the completion of the course. You must convey in writing the basis for the complaint, with specific evidence in support of the argument that the grade either was given in error or was unfairly determined. This formal complaint also should summarize the outcome of the initial inquiry to the course instructor, indicating which aspects are in dispute. Within three weeks of the receipt of the petition, the DUS will determine whether to convene the Undergraduate Affairs Committee, the student, and the instructor(s) for a formal hearing.

Books

The course will mostly rely on the following books (materials will be provided electronically):

- Imai, Kosuke. (2017). *Quantitative Social Science: An Introduction*. Princeton University Press
- Stock, James H. and Mark W. Watson. (2007). *Introduction to Econometrics*. Pearson, 2nd Edition.

- Kellstedt, Paul & Guy D. Whitten. (2013). *The Fundamentals of Political Science Research*, 2nd ed. Cambridge University Press.
- Paradis, Emmanuel. (2005). *R for Beginners*. (will be provided online)

Software

The course will use the statistical software R (see http://cran.r-project.org for excellent online documentation, manuals, and resources). All students are expected to learn R and use it to solve the problem sets.

Course Calendar

Week	Content
May 7	**Introductory Meeting - Discussion of Course Goals and Syllabus** • Paradis (Chapter 2) • Kellstedt and Whitten (Chapters 1 & 2)
May 8 & 9	• R practice (Installation and initial practice with R), Imai (pp. 1-18)
May 13	**Experimental & Observational Studies and Measurement of Variables** • Kellstedt and Whitten (pp. 51-68, 69-114)
May 14	**Random variables, probability distributions, samples and populations** • Stock and Watson (Chapter 2, pp. 17-23) • Imai (Chapter 6, pp. 261-299) • Kellstedt and Whitten (pp. 114-128)
May 15 & 16	• R practice, Imai (pp.17-27), Paradis (Chapter 3) • Assignment: First problem set due
May 20	**Univariate analysis: means, medians, variances and histograms** • Stock and Watson (Chapter 2, pp. 23-29) • Imai (Chapter 6, pp. 299-339)
May 21	**Bivariate analysis: scatterplots, crosstabs, covariance, and correlations** • Stock and Watson (Chapter 2, pp. 34-35, Chapter 3, pp. 92-96) • Imai (Chapter 3, pp. 106-124)
May 22 & 23	• R practice, Paradis (Chapter 4) • Assignment: Second problem set due
May 27	**Probability, Statistical Inference, The law of large numbers, and The central limit theorem** • Stock and Watson (Chapter 2, pp. 45-57) • Imai (Chapter 6, pp. 323-334) • Kellstedt and Whitten (pp. 129-144)
May 28	**Estimation, hypothesis testing and confidence intervals for the population mean** • Stock and Watson (Chapter 3, pp. 65-83) • Imai (Chapter 7, pp. 339-400) • Kellstedt and Whitten (pp. 145-170)
May 29 & 30	• R practice • Assignment: Third problem set due

Week	Content
June 3	**Comparing means from different populations** • Stock and Watson (Chapter 3, pp. 83-92)
June 4 & 5	• R practice
June 6	• **Midterm exam** • Assignment: Fourth problem set due
June 10	**Linear regression model** • Stock and Watson (Chapters 4-5) • Imai (Chapter 7, pp. 400-412) • Kellstedt and Whitten (pp. 171-196)
June 11	**Linear regression model (continued)** • Stock and Watson (Chapters 6-7) • Imai (Chapter 7, pp. 412-422) • Kellstedt and Whitten (pp. 197-219)
June 12 & 13	• R practice • Assignment: Fifth problem set due
June 17	**Generalized Linear Models** • Stock and Watson (Chapter 4) • Kellstedt and Whitten (pp. 220-255)
June 18	**Using linear regression to compare means from different populations and Dynamic Models** • Kellstedt and Whitten (pp. 256-268)
June 19 & 20	• R practice • Assignment: Sixth problem set due
June 24	**Topic of Choice** • Readings assigned based on the choice of topic
June 26 & 27	**NO CLASS** • Assignment: Optional seventh problem set due