

## SYLLABUS: POLITICAL SCIENCE 2500

# Quantitative Political Analysis I

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COURSE INFORMATION	<i>Term:</i> Spring 2024 <i>Lecture:</i> Tuesdays & Fridays, 2:30-3:50 <i>Lab:</i> Thursdays, 7-9 PM <i>Room:</i> ACE 329 <i>Revision:</i> February 6, 2024	<i>Instructor:</i> Jack Reilly <i>Office:</i> College Hall 204 <i>E-mail:</i> <a href="mailto:jreilly@ncf.edu">jreilly@ncf.edu</a> <i>Office Hours:</i> T/F 4-5:30 and by appointment <i>Appointments:</i> <a href="http://jacklireilly.com/appointments">jacklireilly.com/appointments</a>
DESCRIPTION	Researchers, pollsters, journalists, and scientists regularly use quantitative data to understand and describe political phenomena here in the United States and around the world. This course serves as an introduction to the use of those quantitative methods in political science. The class is divided into three interlocking components. The first component we focus on is research design (broadly construed). What is political "science"? What is a scientific theory? What is a variable, and how can it be confounding? What is causality, and how can I use data to assess causal claims? The second component of the course is dedicated to the core mathematical and statistical concepts needed to begin answer to questions about politics. We cover descriptive statistics, basic data visualization, the central limit theorem, hypothesis testing, bivariate and multiple regression, and the connection between these techniques and causal research designs. Finally, the third component of the course covers computation using the R statistical language, introducing students to modern technical strategies for analyzing, managing, and utilizing quantitative social science data.	
PREREQUISITES	None, although basic familiarity with high school algebra and geometry is presumed, as is some awareness of and interest in political, social, and economic phenomena studied in the social sciences. While not required, students may wish to have at least have some introductory substantive coursework in a social science before taking the class.  Recommended <b>co-requisite:</b> introductory writing course course. First year students should strongly consider a <a href="#">New College SET SAIL</a> course if they have not already taken one.	
AOC & CYC REQUIREMENTS	This course fulfills the requirements for an introductory quantitative/statistics course in the Political and Quantitative Social Science AOCs. It also counts for credit toward Public Policy and Urban Studies AOCs. It fulfills CYC requirements for breadth in Mathematics and Social Sciences, and covers CYC Critical Thinking, Information Literacy, and Quantitative Literacy skills.	
BOOKS	<b>Required:</b> Llaudet & Imai, <i>Data Analysis for Social Science</i> . Princeton.  <b>Recommended:</b> Kellstedt & Whitten, <i>The Fundamentals of Political Science Research</i> . (Third Edition) Cambridge University Press.  <b>Optional:</b> While none of these books are required, they are useful for future study in this area if you are interested: <ul style="list-style-type: none"><li>• Bueno de Mesquita &amp; Fowler, <i>Thinking Clearly with Data</i>. Princeton.</li><li>• Imai, <i>Quantitative Social Science: An Introduction</i>. Princeton.</li></ul>	

## Course Requirements

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OVERVIEW	<p>Satisfactory completion of the course requires completion of the following:</p> <ol style="list-style-type: none"><li>1. Regular course preparation and attendance</li><li>2. Assignments (Weekly)</li><li>3. Tests (3)</li></ol>
READING & PARTICIPATION	<p>Class meets three times per week: twice for lectures and workshops with the professor and once in an optional lab section with your TA. Attendance is expected for lectures and workshops and optional (but highly recommended!) for lab sessions.</p>
ASSIGNMENTS	<p>There is an assignment due each week in class. Assignments will vary in nature: some will be one-off problem sets, some may build on problem sets from a prior week. <b>No late assignment work is accepted</b>, as we will go over answers for assignments on the day they are due in class. Students may miss up to two assignments without penalty.</p>
TESTS	<p>Tests have in-class and out-of-class components. The course is cumulative, and each test will be comprehensive.</p>
EVALUATION	<p>To satisfactorily complete the course, you must complete all required assignments and tests. Each assignment and test you submit will receive a score as well as a narrative assessment of your strengths and weakness on that particular submission. If you ever are in danger of receiving an unsatisfactory final course evaluation, that will be made clear to you at checkpoints throughout the course.</p>

## Course Expectations & Guidelines

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ETIQUETTE & DECORUM	<p>A college course is fundamentally a learning community. Be courteous to fellow students and the professor. Don't let yourself be distracted by your cell phone in class. If you disagree with something someone says, do so respectfully (but do so! one of the best ways to learn is from disagreement). Engage with each other and remember: your shared goal is to learn from each other as well as the professor and TA.</p>
OFFICE & CONSULTATION HOURS, APPOINTMENTS	<p>I encourage you to chat with me at any point if you have questions about the course, the readings, college, data science, political science, etc. You can schedule a meeting with me by going to my website here: <a href="http://jacklreilly.com/appointments">http://jacklreilly.com/appointments</a> and sign up for time at your convenience. You can also always just drop in during my regularly scheduled drop-in office hours without appointment.</p> <p>Your TA will also have time dedicated to meeting with students in the lab session of class. You can also chat with your TA about the class outside of regular lab time or office hours—just remember to be courteous of their time. They are students, too, just like you, and have their own full course schedule to attend to as well as leading your lab section!</p>
E-MAIL	<p>Email is the best way to contact me. Students can generally expect a response to all e-mails within 24 hours (and typically sooner), excepting weekends. If your email requires a long response, expect me to encourage you to schedule an appointment with me so that we can more effectively discuss the matter.</p>

ARTIFICIAL  
INTELLIGENCE &  
LLMS

Artificial Intelligence - in particular, Large Language Models like ChatGPT - are incredibly useful tools. However, in the very beginning phases of learning how to write code, where you all are, using them can hamper your ability to understand fundamentals. Accordingly, the use of Artificial Intelligence to complete your assignments is not allowed.

## Class Schedule

TOPICS OUTLINE *(Subject to change)*

	<b>Topic</b>	<b>Readings</b>	<b>Work</b>
MINI CLASSES			
1.1	Course Introduction	None	
1.2	Political Science & Theory	K&W, ch 1	Half-Set 1
2.1	Causality & The Experimental Ideal	K&W, ch 3	
2.2	Introduction to R & RStudio	1-1.6	Half-Set 2
3.1	Observations & Variables	1.7	
3.2	Computing & Interpreting Means	1.8-1.10	PS1
4.1	Experiments & Causality	2-2.4	
4.2	Analyzing Experimental Data	2.5-2.7	PS2
5.1	<i>Review</i>		
5.2	EXAM I		<i>take-home 1</i>
6.1	Survey Research	3-3.4	
6.2	Exploring Bivariate Relationships	3.5-3.7	PS3
7.1	Predicting Non-Binary Outcomes	4-4.4.1	
7.2	Predicting Binary Outcomes	4.6-4.7; 4.9	PS4
SPRING BREAK			
8.1	Confounding Variables	5-5.2	
8.2	Controlling for Confounders in Regression	5.3-5.4	PS5
9.1	Internal & External Validity	5.5-5.7	
9.2	<i>Review</i>		PS6
10.1	EXAM II		
10.2	Probability	6-6.4	<i>take-home 2</i>
11.1	The Central Limit Theorem	6.5-6.8	
11.2	Hypothesis Testing	7-7.1; 7.3	PS8
12.1	BACCALAUREATE DAY		
12.2	Confidence Intervals	7.2; 7.4-7.6	PS9
13.1	Putting it All Together		
13.2	Catch-up		Bonus PS
14.1	<i>Review</i>		
14.2	EXAM III		<i>take-home 3</i>

CLASS RESOURCES Please consult the class Canvas page and google drive for up to date readings, assignments, and schedules. There is work due every Friday of class week - on regular weeks, this will be a problem set; on exam weeks, this will be the take-home portion of your exam. All assignments will be posted a week ahead of time to Canvas.

## Campus Academic Resources

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YOUR ACADEMIC ADVISOR	Your academic advisor is your first resource at the college for navigating your courses and academic work at the college. Many first year students find themselves uncertain about when it is "ok" to go their advisor with questions or for advice—but the real answer is "anytime"! We all have open office hours that you can simply drop in at, even if you don't have an appointment, and are eager to help you.
WRITING SKILLS	Clear writing and argumentation is a critical element to success in college (not to mention, life generally). That said, writing is hard, and students come to college with very different levels of preparation for college level and professional writing. Regardless of your skill and comfort with writing, I strongly recommend exploring the options for writing (and revising!) assistance at the Writing Resource Center. You can schedule an appointment through the writing center here: <a href="https://ncf.mywconline.com">https://ncf.mywconline.com</a>
QUANTITATIVE SKILLS	Like writing skills, quantitative literacy is an integral element to success in college (not to mention, life generally). That said, math is (also) hard, and students come to college with very different levels of preparation for college level and professional data literacy. While this course will cover many aspects of data literacy, should you desire additional support beyond what I and/or the course TA provide, I recommend exploring the options for assistance at the Quantitative Resource Center. The QRC is located in the Academic Resource Center (ARC), located on the first floor of the Jane Bancroft Cook Library.
STUDENT SUCCESS CENTER	Having trouble figuring out how to manage it all? In addition to your faculty mentor and professors, New College has peer to peer coaching and group workshops available at the Student Success Center. The SSC helps you develop the skills necessary for success in college. We offer one-on-one appointments with trained peer coaches, group study sessions, recurring appointments, workshops, printable resources, regular newsletters, and referrals to other campus services. You can find more information here: <a href="https://www.ncf.edu/academics/student-success-center/">https://www.ncf.edu/academics/student-success-center/</a>
CRITICAL THINKING	Students are encouraged to employ critical thinking and to rely on data and verifiable sources to interrogate all assigned readings and subject matter in this course as a way of determining whether they agree with their classmates and/or their instructor. No lesson is intended to espouse, promote, advance, inculcate, or compel a particular feeling, perception, viewpoint or belief.
ADDITIONAL RESOURCES	Please see the Campus Support Resources document—located in the course canvas page and google drive—for all the academic resources available to you at New College, as well as for additional college-wide academic policies.