

Research Methods & Statistics – Spring 2025
PS 5002, Section 101
MW 3:30p.m. – 4:45p.m.
RSW 346

Contact Information

Instructor: Dr. William D. Hicks
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Office Hours: 11:00-12:00, MWF
Make appointment here: [Google Calendar](#)
Meet here: [Zoom Link](#)

Course Objectives and Learning Outcomes

We examine the application of quantitative methods to political science research, in this course. I hope to achieve three separate goals by the end of the semester. First, I want to prepare students to pursue their own research projects using statistics as a means to test hypotheses. Second, I hope to provide students with a sufficient foundation in quantitative methods to prepare them to learn more advanced statistical techniques should they be so inclined. Third, I hope to equip students with the tools necessary to evaluate the merits of existing research using statistical techniques. I split our weekly meetings in this class, spending Mondays in the classroom and Wednesdays in the lab. By doing so, I aim to provide students with weekly examples of how to analyze “real-world” data on their own.

Required Texts and Materials

Pollock , Phillip H. and Barry C. Edwards. 2019. The Essentials of Political Analysis. **Sixth Edition**. Sage/CQ Press: Washington, DC.

We will use [R](#) and [RStudio](#) to complete problem sets for this course. You are welcome to download and install R and R-Studio on your own devices for no charge. If you choose to do so,

you will need to select a “CRAN mirror.” My advice is to select “0-Cloud” as your mirror. As an alternative, you can also access and use R-Studio via an open-source, cloud-based service from [Posit Cloud](#). All you need to do is create profile. The cloud-based service, however, is only free for limited use. To complete the activities in this class, you would likely have to purchase a student license.

Exams & Graded Activities

Participation: Students are expected to attend all classes, read all assigned materials, and contribute to class discussions. Each student’s participation grade will be based on his or her fulfillment of these tasks.

Problem Sets: Students are obligated to complete a problem set roughly each week. Each problem set is worth 5 total points. Students lose points for (1) no answering all of the questions, (2) answering the questions with incorrect information, (3) poor writing and grammar, and (4) poor presentation of the results in tables and figures.

Final Exam: This course will conclude with a **take home**, comprehensive exam.

Course Grades

<i>Grading Scale</i>	C	73-76	<i>Grade Requirements</i>
A	C-	70-72	Participation
A-	D+	67-69	Assignments
B+	D	63-66	Final Exam
B	D-	60-62	
B-	F	0-59	
C+			

Policies about Absences & Illness

If you miss a scheduled exam, assignment, or activity, you have 24 hours after the start of the exam to provide me with documentation excusing the absence (if you would like to schedule a makeup). Failure to do this within 24 hours will result in a 0 for the exam.

If you feel sick, please stay home. Send me an email before you miss class, and I will do my utmost to help you get the material you missed.

Student Conduct

As a community of learners at Appalachian State University, we must create an atmosphere of honesty, fairness, and responsibility, without which we cannot earn the trust and respect of each

other. Furthermore, we recognize that academic dishonesty detracts from the value of an Appalachian degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form and will oppose any instance of academic dishonesty. This course will follow the provisions of the Academic Integrity Code, which can be found on the Office of Student Conduct Web Site:

www.studentconduct.appstate.edu

Statement on Student Engagement with Courses

In its mission statement, Appalachian State University aims at “providing undergraduate students a rigorous liberal education that emphasizes transferable skills and preparation for professional careers” as well as “maintaining a faculty whose members serve as excellent teachers and scholarly mentors for their students.” Such rigor means that the foremost activity of Appalachian students is an intense engagement with their courses. In practical terms, students should expect to spend two to three hours of studying for every hour of class time. Hence, a fifteen-hour academic load might reasonably require between 30 and 45 hours per week of out-of-class work.

Disability Support Services

Appalachian State University is committed to making reasonable accommodations for individuals with documented qualifying disabilities in accordance with the Americans with Disabilities Act of 1990, and Section 504 of the Rehabilitation Act of 1973. Those seeking accommodations based on a substantially limiting disability must contact and register with The Office of Disability Services (ODS) at <http://www.ods.appstate.edu/> or 828-262-3056. Once registration is complete, individuals will meet with ODS staff to discuss eligibility and appropriate accommodations.

Religious Observances Policy

Faculty members are required to make reasonable accommodations for students requesting to miss class due to the observance of religious holidays. All ASU students are allowed a minimum of two absences per year for religious observances. Up to two absences for such observances will be excused, without penalty to the student, provided that the student has informed the instructor in the manner specified in the syllabus. Notice must be given by the student to the instructor before the absence occurs and no later than three weeks after the start of the semester in which the absence(s) will occur. Arrangements will be made to make up work missed by these religious observances, without penalty to the student. For the purposes of this policy, ASU defines the term “religious observance” to include religious holidays, holy days, or similar observances associated with a student’s faith that require absence from class. Faculty, at their discretion, may include class attendance as a criterion in determining a student’s final grade in the course. On the first day of class, faculty must inform students of their class attendance policy and the effect of that policy on their final grade; both policies must be clearly stated in the class syllabus.

Syllabus Change Policy

This syllabus is only a guide for the course and is subject to change with advanced notice.

Course Schedule

Week 1. January 13 & 15

Course Introductions, R & R-Studio Overview, Writing Code

Week 2. January 20 & 22

[No Class January 20]

Research Design, Causality, & Statistics

- Read: Pollock & Edwards, Chs. 3 & 4
- Topics: Research Design; Causality; R

Week 3. January 27 & 29

Variables, Measuring ‘Average,’ and Measuring Dispersion

- Read: Pollock & Edwards, Chs. 1 & 2
- Topics: types of variables and coding schemes; distributions; measures of average & dispersion
- Problem set #1 due Monday, February 3

Week 4. February 3 & 5

Probability and Statistical Inference

- Read: Pollock & Edwards, Ch. 6
- Topics: probability & odds; confidence interval for $\hat{\pi}$
- Problem set #2 due Monday, February 10

Week 5. February 10 & 12

Probability and Statistical Inference II

- Read: Pollock & Edwards, Chs. 5, 6, 7
- Topics: sampling, distributions, & standard error; confidence interval for $\hat{\mu}$
- Problem set #3 due Monday, February 17

Week 6. February 17 & 19

Null Hypothesis Testing

- Read: Pollock & Edwards, Chs. 5, 6, 7
- Topics: cross-tabs, odds ratios & χ^2 ; mean differences & t-tests
- Problem set #4 due Monday, February 24

Week 7. February 24 & 26

Regression I. Bivariate Models

- Read: Pollock & Edwards, Chs. 8
- Topics: correlation; scatterplots; OLS
- Problem set #5 due Monday, March 3

Week 8. March 3 & 5

Regression II. Adding More Variables to the Right Hand Side

- Read: McClendon, Ch. 3
- Topics: multiple regression
- Problem set #6 due Monday, March 17

Week 9. March 10 & 12

[No Class March 10 & 12]

Week 10. March 17 & 19

Regression III. Using Dummy Variables

- Read: McClendon, Ch. 5
- Read: Pollock & Edwards, p. 149-154
- Topics: making and using dummies with OLS
- Problem set #7 due Monday, March 24

Week 11. March 24 & 26

Regression IV. Non-Additive Effects

- Read: McClendon, Ch. 7
- Read: Pollock & Edwards, p. 154-160
- Topics: interaction effects
- Problem set #8 due Monday, March 31

Week 12. March 31 & April 2

Regression V. Nonlinear Effects

- Read: McClendon, Ch. 6
- Topics: advanced polynomials
- Problem set #9 due Monday, April 7

Week 13. April 7 & 9

Regression VI. Assumptions & Diagnostics

- Read: Berry, Understanding Regression Assumptions
- Topics: OLS assumptions
- Problem set #10 due Monday, April 14

Week 14. April 14 & 16

Binary Choice Dependent Variables I

- Read: Long, Ch. 3
- Pollock, Ch. 9
- Topics: Logit and probit

Week 15. April 21 & 23

[NO CLASS]

Week 16. April 28 & 30

Binary Choice Dependent Variables II

- Read: Long & Freese, Chs. 5 & 6
- Topics: Logit and probit

Final Exam. May 5