POLS 325: Applied Research Methods
North Dakota State University, Spring 2019, 4 Credits

Basic Information

Professor: Dan Pemstein
Email: daniel.pemstein@ndsu.edu
Office: Putnam 104C

Class Location: Minard 208
Class Time: TTh 2:00–3:15
Office Hours: TTh 3:30-4:30

Lab Instructor: Ryan Petrusic
Email: kelsey.petrusic@ndsu.edu

Lab Location: Quentin Burdick 114
Lab Time: F 2:00–2:50

Course Description

Overview

Students in this course will learn how to build basic statistical models to aid in the development and empirical investigation of theories of human behavior. This course provides a hands-on introduction to quantitative data analysis using state-of-the-art computational tools, and covers techniques ranging from basic data visualization and descriptive statistics, to statistical hypothesis testing and linear regression. Furthermore, students will learn how to apply the scientific method to the study of social systems and how to generate and evaluate hypotheses about how such systems work. In the process, students will engage key questions of research design, such as sampling, control, and measurement.

Objectives

Upon completion of POLS 325, students should be able to design and conduct an original social science research project, using appropriate data collection and analysis techniques. They should also have developed a basic grasp of the R statistical software package.

Texts

The following required textbook is available for purchase at the University bookstore:

- Daniel T. Kaplan. 2012. *Statistical Modeling: A Fresh Approach, 2nd Ed.* Project MOSAIC.

All other readings are available on Blackboard.

Evaluation

Summary

Standard Labs ($\times 11$)	55% (5% each)
Midterm Lab	15%
Final Lab	20%
Participation	10%

Basic Labs

Over the course of the semester students will complete a series of 11 lab assignments that will help them to develop their research design and statistical modeling skills. Students will have one week to complete each assignment. Students are free to discuss these assignments with other students at length, although each student must collect and code their own data, conduct their own analyses, write their own R code, and write up their own answers.

Midterm Lab

The midterm lab is simply a more involved, two week, version of the basic labs. Students will complete a lab write-up as part of this assignment. Again, students may discuss the midterm lab with other students in depth but must complete all aspects of the assignment themselves.

Final Lab

Students will conduct a small research project from start to finish and produce a detailed written description of their research questions, methodology, and results. *In contrast to other assignments, students may not discuss details of the final lab with one another.*

Participation

You are expected to attend every class and to participate in class activities and discussions. Participation is worth 10 percent of your final grade and will reflect your engagement in and contribution to class discussion, not simple attendance (which should be a given, although lack of attendance will negatively impact your grade). Participation can take many forms, including—but not limited to—asking questions, answering my queries, engaging in class debate, and taking an active role in group activities. Towards the end of the semester, each student will write a short (1 page) paper making an evidence-based case for the participation grade that she feels she deserves. These papers, and the persuasiveness of their arguments, will form the basis for students' participation grades. Although you have substantial leeway in how you make your case for your participation grade, your self-evaluation should follow this rough rubric:

A   Strong attendance, frequent and thoughtful verbal participation,
    active participation in group work
B   Strong attendance, regular and thoughtful verbal participation,
    active participation in group work
C   Strong attendance, some verbal participation, satisfactory participation in group work
D   Missed more than 3-4 classes, little to no verbal participation in class,
    lack of engagement in group work
F   Frequently miss class, no verbal participation, leave your group members hanging

Class Policies

Grades

I use a flat grade scale: A=90–100, B=80–89, C=70–79, D=60–69, F=59 or lower. If you have a complaint about a lab grade you must type a formal appeal describing the problem. Your appeal should make a cogent argument for improving your grade. Attach a copy of the original lab to your appeal.

Late Assignments

I will not accept late assignments except in extreme, and unexpected circumstances.

Academic Honesty

The academic community operates on the basis of honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Please do make sure that you understand common standards of academic integrity and plagiarism. You can find information about academic honesty at www.ndsu.edu/academichonesty. I will deal with academic dishonesty and plagiarism *harshly*. If you violate accepted standards you will certainly fail the relevant assignment. In most cases, you will, at minimum, fail the class.

Electronic Devices

You may never use a cell phone in class. I discourage the use of laptops or other electronic devices because research shows that students who use such devices, and the students sitting near them, perform worse than students who take notes by hand. If you have a compelling reason to use an electronic device during class, please discuss it with me first.

Students with Disabilities

Any students with disabilities or other special needs who need special accommodations in this course are invited to share these concerns or requests with the instructor and contact the Disability Services Office (http://www.ndsu.edu/disabilityservices/) as soon as possible.

Veterans

Veterans and student soldiers with special circumstances or who are activated are encouraged to notify the instructor in advance.

Schedule

Date	Topic	Reading
1/8	Introduction	
1/10	Models of Social Processes	SM Ch. 1, Imai (2017) Ch. 1
1/11	Lab 1	
1/15	Data & Describing Variation	SM Ch. 2 & 3
1/17	**No class**	
1/18	Lab 2	
1/22	Social Science Theory	Shively (1998) Ch. 2
1/24	Measurement	Kellstedt & Whitten (2009) Ch. 5
1/25	Lab 3	
1/29	Research Design & Causality	Shively (1998) Ch. 6, Imai (2017) Ch. 2
1/31	Group-Wise Models	SM Ch. 4
2/1	Lab 4	
2/5,7	Confidence Intervals	SM Ch. 5
2/8	Lab 5	
2/12,14	Model Fundamentals	SM Ch. 6
2/15	Lab 6	
2/19,21	Linear Models	SM Ch. 7, Imai (2017) Ch. 4
2/22	Midterm Lab	
2/26	Fitting Linear Models	SM Ch. 8
2/28	Correlation and R^2	SM Ch. 9
3/1	Midterm Lab (continued)	
3/5,7	Partial Relationships in Linear Models	SM Ch. 10
3/8	Lab 7	
3/12,14,15	**Spring Break**	
3/19,21	Modeling Randomness	SM Ch. 11, Imai (2017) Ch. 6
3/22	Lab 8	
3/26,28	Confidence in Models	SM Ch. 12, Imai (2017) Ch. 7
3/29	Lab 9	
4/2,4	The Logic of Hypothesis Testing	SM Ch. 13
4/5	Lab 10	
4/9,11	Hypothesis Tests on Whole Models	SM Ch. 14
4/12	**Spring Recess**	
4/16,18	Hypothesis Tests on Parts of Models	SM Ch. 15
4/19	Lab 11	
4/23,25	Causation Revisited	SM Ch. 17 & 18, Imai (2017) Ch. 2
4/26	Final Lab	
4/30, 5/2,3	Final Lab	
5/5	Final Lab Due (11:59 PM)	