JLC 681: Intro to Justice Research II

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Office Hours: Thurs 2:30 p.m. - 5:30 p.m.
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Class Hours: Thurs 5:30 p.m. - 8:00 p.m.
Class Room: Hurst 210

Course Description

This course is the final course in a sequence of courses intended to help students develop the skills necessary to design, critique and execute social science research. Each week, we discuss a set of readings and statistical concepts. Most weeks, we will also have a stats lab that incorporates R, a free statistical analysis program. These labs will help prepare you for the exams as well as the final research paper. In the final weeks of the course, we will have mock panels and simulate an academic conference experience. At these panels, students will present their research, receive feedback from a discussant, and field questions from the audience.

Course Objectives

1. Learn and apply statistical concepts
2. Develop the tools to critique quantitative research
3. Introduce students to R for both data management and data analysis
4. Develop skills to perform scholarly research and to disseminate

Learning Outcomes

- Understand and apply basic statistical concepts
- Use basic descriptive statistics to identify central tendency and dispersion of variables
- Test hypotheses and construct confidence intervals
- Estimate and interpret basic multivariate regression models
- Perform original quantitative research
- Learn how to use statistical software (R) for data manipulation and analysis

Course Format

Each week we discuss a series of readings. You are responsible for each reading. These readings will then serve as a basis for using the tools/concepts in statistical analysis. We then apply

these tools in a directed lab setting using R. Following these labs, you will have an assignment or problem set that reinforces what we learned.

This course will require a great deal of reading and active participation on your part. You must be prepared each day and engage in the discussions, labs, workshops, and other activities, to be successful.

Required Materials

Books

1. Miethe, Terance D and Jane Florence Gauthier (2008). *Simple statistics: Applications in social research*. Oxford University Press.
2. Grolemund, Garrett and Hadley Wickham (2018). *R for data science*.

We will use the Miethe and Gauthier text as the main conceptual guide.

The Grolemund and Wickham book is the best guide to starting to use R. It is available for free online https://r4ds.had.co.nz or you can buy from your favorite book seller. Other useful reference guides and R help is on the canvas site as well as online.

R

- Free download of R (select Mac or Windows) https://www.r-project.org
- Free download of Rstudio (do not buy the pro version, not needed) https://rstudio.com/products/rstudio/

Evaluation

The grading scale for this class is as follows:

A	= 94+	C	= 74-76
A-	= 90-93	C-	= 70-73
B+	= 87-89	D+	= 67-69
B	= 84-86	D	= 64-66
B-	= 80-83	D-	= 60-63
C+	= 77-79	F	= 59 & below

Participation (10%):

You should think about class as a time for exploration; for figuring out what the readings mean; for critically evaluating arguments made by various authors, by other students, and by me; for connecting the assigned materials to other things you think are relevant and important. A number of things follow from this:

Attendance is required. There is no way to recreate this process of discussion by yourself. It is not enough to understand the readings or to get notes from a fellow student. Since we meet once a week, I expect you will be at every class. Without proper documentation, an absence will count against the participation grade. Students who miss more than three classes for any reason may not be able to pass the course.

Careful reading is essential. Students must strategically read all assignments, noting questions or points that they want to raise in class. You will receive a discussion grade for each class period. This grade will be based on your contributions to class discussion, any oral presentations, group projects, or short written assignments that contribute to class discussion. Quizzes, both pre-announced and not, could occur and would be factored into this discussion grade. Finally, you will do some problem sets in R that will be included in this grade as well.

Special COVID considerations. If you are unable to make a class for any reason, I can record the session. With that said, you miss the interactive piece that cannot be replicated. Too many of these instances may lead to a reduction in your grade. My zoom for class and office hours is always the same: 966.177.2306.

I will assign a grade for the participation each week based on the following scale:

- A (outstanding) your comments were insightful and contributed to collective understanding of the material across the readings
- A- (strong) your comments were sometimes insightful and sometimes average but were not consistent across the readings
- B+ (good) your comments demonstrated that you understood the material but did not extend the discussion or offer new insights
- B (average) you participated but did not seem to fully grasp the material
- B- (poor) you spoke, but your comments were not germane to the material
- C (unacceptable) you didn't say anything…

Problem Sets (10%):

Most weeks, I will assign you a problem set that implements concepts discussed and demonstrated in class. These problem sets are meant to reinforce the topic from the previous week and to prepare for the exams and the final paper.

Midterm Exam (30%):

On March 1st, you will receive a take-home mid-term exam covering the theoretical foundations learned in the first half of the semester. This test will be open-note, and you may use any materials on the Internet. All questions will be essay style that require analysis and synthesis of course material. You may not consult your peers or anyone else. You will also be asked to do simple tasks in R. The exam will be due by 5:00 pm to Canvas on March 5th.

Research Paper (40%):

Detailed instructions are on Canvas for this assignment. The research paper must be 20-25 pages (including references, tables, graphs, etc). It is due on the last day of formal classes, April 29th. The quality of the paper, however, is more important than the quantity.

Research Presentation (10%):

During the final exam period for class, each student will present their research using powerpoint or equivalent (RMarkdown). You will make youtube or equivalent videos for other students to watch the presentation. You will also field questions from the instructor and other class members in the discussion/comments section of the video. More detailed instructions are on Canvas.

Academic Integrity Code

Students should be aware of the contents of the AU Academic Integrity Code. I regard violations of this code seriously and will immediately refer the matter to the Dean, should such violations occur. Please see me if you have any questions about the academic violations described in the code either in general or as they apply to particular requirements of this course.

Additional Support Services

If you experience difficulty in this course for any reason, please do not hesitate to contact me. In addition to the resources of the school, a wide variety of services are available to help you in your efforts to meet the requirements of the course.

- Academic Support Center (x3360, MGC 243): offers study skills workshops, individual instruction, tutor referrals, and services for students with learning disabilities.
- Writing support is available in the ASC Writing Lab or in the Writing Center, Battelle 228.
- Counseling Center (x3500, MGC 214): offers counseling and consultations regarding personal concerns, self-help information, and connections to off-campus mental health resources.
- Disability Support Services (x3315, MGC 206): offers technical and practical support and assistance with accommodations for students with physical, medical or psychological disabilities.

If you quality for accommodations due to a disability, please notify me in a timely manner with a letter from the ASC or DSS so that we can make arrangements to address your needs.

Classroom Courtesy

Classroom courtesy is an essential component of creating an effective learning environment. All students have the right to learn without unnecessary distractions. These distractions include: cell phones, talking during lectures (unless recognized by the instructor), reading newspapers, falling asleep, etc. If you need a cell phone for emergency purposes, leave it on vibrate. Entering and leaving are also significant sources of distraction. It is your responsibility to be on time and to stay for the entire period. In circumstances where you need to leave early, tell the instructor beforehand. Repeated disruptions of class will lead to a reduction in your final grade.

Special Zoom considerations: mute your mic when you are not speaking. Have your camera on unless you need to step away for a moment or speak to me prior. Focus on class activities, not instagram, twitter, your email, etc.

Most importantly, class discussions of the issues as they relate to violence, can lead to strong feelings and heated debate. Because this is a college classroom, all discussion must be respectful and scholarly.

Scholarly Comments

- are respectful of diverse opinions and open to follow up questions and/or disagreement
- are related to class and/or the course material
- focus on advancing the discussion about issues related to the course and/or course material rather than personal beliefs, and
- are delivered in normal tones and a non-aggressive manner.

Unacceptable Comments

- are personal in nature. This includes attacks on a person's appearance, demeanor, or political beliefs.
- include interrupting the instructor or other students and not allowing people to speak.
- often use the discussion to argue for political positions and/or beliefs. If political discussions arise, they must be discussed in a scholarly way (see above).
- may include using raised tones, yelling, engaging in arguments with other students and being threatening in any manner.
- include ignoring the instructor's authority to maintain the integrity of the classroom environment.

Tentative Class Schedule

Read the following before Wednesday's class session. *Important*: class readings are subject to change given changing circumstances. Any adjustments to this schedule will be posted in a revised syllabus on Canvas.

Week 01, 01/10 - 01/14: What is statistical reasoning? How do I do it?

- Miethe, Terance D and Jane Florence Gauthier (2008). *Simple statistics: Applications in social research*. Oxford University Press. , Chapters 1 + 2
- Introductions
- Review of concepts
- Silver, Nate. 2012. *The Signal and the Noise* Chapter 8 (Bayesian statistical reasoning)
- Intro to R and R studio, https://moderndive.netlify.app/1-getting-started.html, Do section 1-1.5
- Stats Lab #1–Meet R and R Studio

Week 02, 01/17 - 01/21: Data! Getting Data Ready for Analysis

- Miethe and Gauthier, Chapter 3
- Types of Data in R, Irizarry, Rafael A. *Introduction to Data Science: Data Analysis and Prediction Algorithms with R*. CRC Press, 2019. pgs. 49 - 53.
- Check out https://www.kaggle.com for data people put online for free
- Check out https://dataverse.harvard.edu for data scholars post (again free)
- **Bring a data set that you found**
- Stats Lab #2 - Where to find data, how to get data into R

Week 03, 01/24 - 01/28: More Data! Displaying Data

- Miethe and Gauthier, Chapter 4
- Kastellec, Jonathan P., and Eduardo Leoni. 2007. "Using Graphs Instead of Tables to Improve the Presentation of Empirical Results in Political Science.'' *Perspectives on Politics* 5(4):755-771.

- Tufte, Edward. *The Visual Display of Quantitative Information* Chapter 1, 13-51.
- Wickham and Grolemund, Chapter 1, pgs. 3-35.
- Stats Lab #3 - Transforming Variables and Making Graphs

Week 04, 01/31 - 02/04: How to describe data? Means, Medians, Modes, Variation, and Dispersion

- Miethe and Gauthier Chapters 5 + 6
- Means, Medians, Modes in R

https://www.codecademy.com/learn/learn-r/modules/r-stats-mean-median-mode/cheatsheet

- Variance and Standard Deviation in R

https://influentialpoints.com/notes/n3rvari.htm

- **Bring a codebook from data that are interesting to you**
- Stats Lab #4 - Descriptive Stats and Comparisons

Week 05, 02/07 - 02/11: Why be Normal? The Normal Curve and Sampling Distributions

- Miethe and Gauthier, Chapter 7
- Central Limit Theory using R

https://www.econometrics-with-r.org/2-2-RSATDOSA.html

- Stats Lab #5 - The Normal Distribution

Week 06, 02/14 - 02/18: Breadth vs. depth? Parameter Estimation and Confidence Intervals

- Miethe and Gauthier, Chapter 8
- Video on sampling error and confidence intervals

https://www.youtube.com/watch?v=tFWsuO9f74o

- Confidence intervals in R

https://homerhanumat.github.io/elemStats/confidence-intervals.html

- Exam Review

Week 07, 02/21 - 02/25: Individual Demonstration of Knowledge and Skills…Midterm Exam

- Individual conferences this week about final project and complete Midterm exam

Week 08, 02/28 - 03/04: How can I be Wrong? Hypothesis Testing

- Miethe and Gauthier, Chapters 9 and 10
- Hypothesis testing in R https://data-flair.training/blogs/hypothesis-testing-in-r/
- Stats Lab #6–Hypothesis Testing

Week 09, 03/07 - 03/11: Spring Break

- Be well

Week 10, 03/14 - 03/18: It All Depends: Contingency Tables, ANOVA

- Miethe and Gauthier Chapters 11 + 12
- Contingency Tables in R

https://www.r-bloggers.com/2020/12/contingency-tables-in-r/

- Anova in R

https://www.scribbr.com/statistics/anova-in-r/

- Stats Lab #7–Contingency Tables, Chi-square, and ANOVA

Week 11, 03/21 - 03/25: Regression Analysis I

- Miethe and Gauthier Chapters 13 + 14
- Berry and Sanders, Chapter 2.
- Kennedy, p. 47-59
- Linear Regression in R (Read up to "Predicting Linear Models")

https://www.machinelearningplus.com/machine-learning/complete-introduction-linear-regression-r/

Recommended videos to watch:

- Intro to Regression https://www.youtube.com/watch?v=zPG4NjIkCjc
- Calculating Least Squares https://www.youtube.com/watch?v=JvS2triCgOY

Bring your data

- Stats Lab #8–Intro to Linear Regression

Week 12, 03/28 - 04/01: Regression Analysis II - Dummy Variables and Heteroscedasticity

- Kennedy, p.136-139 and p.248-258.
- Gujarati, pp.297-306
- Downs, George and David Rocke. 1979. "Interpreting Heteroskedasticity.'' *American Journal of Political Science* 23: 816-828.

Recommended Videos to watch:

- Dummy variables in R

https://www.youtube.com/watch?v=7J_wS1uEt50

- Heteroscedasticity:What is it?

https://www.youtube.com/watch?v=zRklTsY9w9c

- Testing for it-R implementation

https://www.youtube.com/watch?v=Bs5hJjNvpK0

Bring your data

- Stats Lab #9–Dummy Variables and Heteroscedasticity

Week 13, 04/04 - 04/08: Regression Analysis III - Multicollinearity and Specification

- Gujarati, Chapter 10
- Kennedy, Chapter 11
- Lemieux, Peter H. 1978. "A Note on the Detection of Multicollinearity." American Journal of Political Science 22 (1): 183-186.
- Ray, James Lee. 2005. "Constructing Multivariate Analyses (of Dangerous Dyads)," Conflict Management & Peace Science 22(4): 277-292.

Recommended videos to watch:

- Multicollinearity in R

https://www.youtube.com/watch?v=I4z3yjoEADY

- Entertaining alternative hypotheses

https://www.youtube.com/watch?v=JEKUWo2OivA

Bring your data - Stats Lab #10–Multicollinearity and specification

Week 14, 04/11 - 04/15: Final Model Preparations and Paper Workshop

- Wickham and Grolemund pgs. 81-108
- Visually displaying model outcomes

https://cran.r-project.org/web/packages/jtools/vignettes/summ.html

- Review paper materials, including research paper template, rubric, etc.
- Bring Tables/Graphs for the final paper

Stats Lab #11–Final Models

Week 15, 04/18 - 04/22: Experiments, Final Paper Due

1. Druckman, James N, Donald P Green, James H Kuklinski, and Arthur Lupia (2011). "An introduction to core concepts' '. In: *The Cambridge handbook of experimental political science*.
2. Druckman, James N, Donald P Green, James H Kuklinski, and Arthur Lupia (2011). "Experimentation in political science' '. In: *Cambridge handbook of experimental political science*, pp. 3–11.
3. McDermott, Rose. "The ten commandments of experiments." PS: Political Science & Politics 46.3 (2013): 605-610.

Week 16, 04/25 - 04/29: Final Exam/Presentations