



SOCY 730

Statistical Analysis in Sociology

Mo. & We., 5:30p - 6:45p (online synchronous)

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Office Hours: by appointment via video call

This syllabus is subject to change. I will endeavor to indicate such changes if they occur.

Course Description: This course is the first building block of the graduate statistics sequence in the Department of Sociology. It is designed to accomplish two tasks. First, the course aims to introduce the student to statistical reasoning, the principles of statistical inference, and computer programming using specialized statistical software. Second, the course seeks to introduce students to the use and logic of statistical analysis. The first half of the course focuses on descriptive statistics and inferential methods (i.e., significance tests and confidence intervals). The second half introduces bivariate methods (e.g., analysis of contingency tables and linear regression) and multiple linear regression. The focus of this course will be on hands-on data analysis and the application of basic statistical methods. By the end of the course, students will be able to understand, assess, and criticize the use of basic statistical methods in the social sciences.

Prerequisite(s): None.

Text: Agresti, Alan. 2018. *Statistical Methods for the Social Sciences*. 5th Edition. London: Pearson Education (either the U.S. or the Global Edition will work).

- **Suggested Text:** Matloff, Norman. 2011. *The Art of R Programming. A Tour of Statistical Software Design*. 1st Edition. San Francisco: no starch press. This book is a useful reference. I will, however, provide the students with the necessary programming skills to succeed in this class.

Software: This class is based on R, a programming language for statistical computing. All problem sets and analyses in the final exam must be completed in R. This software is freely available under the GNU General Public License. We will also be using RStudio as the integrated development environment (IDE) for R.

Course Objectives:

At the completion of this course, students will be able to:

1. Recognize and understand key assumptions behind basic statistical methods in the social sciences.
2. Understand and interpret results published in peer-reviewed journals in sociology.
3. Be aware of the limitations of mainstream statistical analysis.
4. Use statistical software to analyze data.

Grade Distribution:

6 problem sets (8.34 points each)	50%
Midterm	20%
Final exam	30%

Letter Grade Distribution:

≥ 93.00	A	73.00 - 76.99	C
90.00 - 92.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	B	63.00 - 66.99	D
80.00 - 82.99	B-	60.00 - 62.99	D-
77.00 - 79.99	C+	≤ 59.99	F

Problem sets:

Problem sets are always due before class starts on the day noted. Problem sets will be uploaded to **Blackboard**. If you prefer to write the solutions to the problem sets by hand (instead of typing them in, say, **Word** or **L^AT_EX**) please do so with very clear handwriting. Scan your files, then upload them to **Blackboard** like everyone else. Problems sets will always require a companion **R** script.

Midterm:

Midterm exam will be in-class (i.e., I will be available via **Zoom**) and open book. Students will use a calculator and may use an 8.5 x 11 sheet of paper with one side of notes. I will also provide a sheet of essential equations.

Final Exam:

Final exam will be in-home and will require you to be able to use **R** to both clean and analyze data. I will provide the data set and specific guidelines to analyze the data. In terms of format, the final exam must look like a standard quantitative paper (i.e., intro + theory & hypotheses + data + results + discussion & conclusions) and must have a companion **R** script.

Online Synchronous Classes:

This is a synchronous online class, which means that class lectures require you to concurrently be in the same virtual space (i.e., **Zoom**) with me and your classmates. There are obvious pros and cons to this approach. We all have to adapt to this new normal due to **COVID-19**. I will be available to answer questions via e-mail or via video calls. It is your responsibility to reach out to me with any questions you may have regarding the class material.

Class Schedule:

The class schedule gives you the required readings. The weekly material might change as it depends on the progress of the class. However, you must keep up with the readings. It is your responsibility to stay informed about our current place in the course. Readings must be done before class time that day. I might assign additional substantive supplemental readings throughout the semester.

Week	Content	Readings
Week 1	• Aug. 24, Welcome & Intro to R • Aug. 26, Intro to R II	Agresti, 1
Week 2	• Aug. 31, Intro to R III • Sep. 02, Measurement & Randomization	Agresti, 2.1 - 2.2
Week 3	• Sep. 07, Sampling & Randomization class exercise • Sep. 09, Sampling & Randomization Lab • Sep. 07, Problem Set I: R programming	Agresti, 2.3 - 2.5
Week 4	• Sep. 14, Univariate & Bivariate Description • Sep. 16, Univariate & Bivariate Description lab	Agresti, 3.1 - 3.7
Week 5	• Sep. 21, Probability Distributions • Sep. 23, Probability Distributions lab • Sep. 21, Problem Set II: Describing Data	Agresti, 4.1 - 4.3
Week 6	• Sep. 28, Sampling Distributions • Sep. 30, Sampling Distributions lab	Agresti, 4.4 - 4.7 & 5.1
Week 7	• Oct. 5, Confidence Intervals • Oct. 7, Confidence Intervals lab • Oct. 05, Problem Set III: Prob. & sampling dist.	Agresti, 5.2 - 5.4
Week 8	• Oct. 12, Significance Tests & Types of Errors • Oct. 14, Significance Tests & Types of Errors lab	Agresti, 6.1 - 6.5
Week 9	• Oct. 19, Comparing Means & Proportions • Oct. 21, Comparing Means & Proportions lab • Oct. 19, Problem Set IV: CIs & sig. tests	Agresti, 7.1 - 7.4
Week 10	• Oct. 26, Chi-squared Methods • Oct. 28, Midterm	Agresti, 8.1 - 8.4
Week 11	• Nov. 02, Chi-squared Methods lab • Nov. 04, The Linear Regression Model (LRM): OLS	Agresti, 9.1 - 9.4
Week 12	• Nov. 09, LRM: The Statistical Model • Nov. 11, LRM lab • Nov. 09, Problem Set V: Chi.2 methods	Agresti, 9.5 - 9.7
Week 13	• Nov. 16, LRM: Binary Predictors • Nov. 18, The Multiple Regression Model (MRM)	Agresti, 11.1 - 11.3
Week 14	• Nov. 23, MRM: Non-additive Models • Nov. 25, Thanksgiving	Agresti, 11.4
Week 15	• Nov. 30, MRM: Comparing Models • Nov. 30, Problem Set VI: LRM & MRM	Agresti, 11.5
Final	Dec. 07, 11:59pm via Blackboard	Agresti, 1 - 11

Course Policies:

- Phones are not allowed as calculators. **Please make sure you bring an actual calculator to every class.**
- Collaboration in order to solve and discuss the problem sets is allowed and encouraged. However, each student is required to send an individual file showing their own individual work.
- A minimum grade of C is required in this course to progress to SOCY 731.

Academic Honesty Policy:

You are expected to practice the highest possible standards of academic integrity. Any deviation from this expectation will result in a minimum academic penalty of your failing the assignment, and will result in additional disciplinary measures. This includes improper citation of sources, using another student's work, and any other form of academic misrepresentation.

Online submission of a problem set implies that the student has complied with the Academic Honesty Policy in that work. Please refer to the full text of the Code of Conduct and Honor Code of the University for more details.

Late Submission & Attendance Policy:

In the absence of a valid excuse, late homework will be accepted, but a letter grade will be reduced for each class day late. See the University policy regarding excusable absences and class attendance [here](#).

Diversity Policy:

In addition to scheduling exams, I have attempted to avoid conflicts with major religious holidays. If, however, I have inadvertently scheduled an exam or major deadline that creates a conflict with your religious observances, please let me know as soon as possible so that we can make other arrangements.

Similarly, if English is not your first language and you feel like that could interfere with your ability to do well in this course please do let me know. I am confident I can provide resources and guidance to help you succeed.

Learning and Psychological Disabilities:

Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Office of Student Disability Services: 777-6142, TDD 777-6744, email sasds@mailbox.sc.edu, or stop by LeConte College Room 112A. All accommodations must be approved through the Office of Student Disability Services.