SOC 401: Sociological Statistics
Syllabus, Fall 2019

Meetings	9:30 – 10:45 on Tuesdays and Thursdays 4113 Behavioral Sciences Building
Instructor	**Mahesh Somashekhar** Email: msoma@uic.edu Phone: 312-996-5373 Office: 4170 Behavioral Sciences Building Office Hours: 11:00 – 11:30 & 2:30 – 3:00 on Tuesdays, and by appointment
Teaching Assistant	**Rebecca Abbott** Sections: AB1 OH: 2:00 – 4:00 on Fridays, 4126A Behavioral Sciences Building Email: rabbot3@uic.edu
Course Webpage	Available on Blackboard
Contact	For simple questions, email is the best way to reach me or your TA. We will respond to your messages within 72 hours. For more involved questions or discussions, please use our office hours.

Course Description:

Statistics is both a *tool* and a *language* that helps people describe large amounts of information. As a tool, statistics allows analysts of the social world to simplify and organize quantitative data into coherent, rigorous observations. As a language, statistics enables social observers to talk about large-scale data in clear and precise ways. Statistics is indeed the primary language of public policy discourse, and a mastery of statistics enables one to speak the language of public policy discourse in order to improve it.

This introductory statistics course is structured to help students use statistical analysis in order to make useful contributions to sociological inquiry, applied research, and social activism. In addition to introducing students to statistics, this course exposes students to the foundations of causal reasoning. Sound causal reasoning is essential to any good research design, especially when that research design involves complicated regression techniques, which require elaborate data structures and strong assumptions about one's data. In addition, this course helps students learn STATA, a commonly used statistical software package that enables the user to do elementary and advanced statistical analysis.

Course Requirements:

The only official requirement for this course is SOC 201 and two additional 200-level sociology electives; or graduate standing or consent of the instructor. Nevertheless, all students will be expected to do basic algebra and arithmetic. For students who may need a refresher on algebra and arithmetic going into the course, I recommend reading the citations below. Both books are short and are companions to one another.

Hagle, Timothy M. 1996. <u>Basic Math for Social Scientists: Concepts</u>. Thousand Oaks, CA: Sage Publications.
Hagle, Timothy M. 1996. <u>Basic Math for Social Scientists: Problems and Solutions</u>. Thousand Oaks, CA: Sage Publications.

For students going into the course who want a better appreciation of how learning statistics can enhance their non-quantitative research, I would recommend the citations below:

Johnson, R. Burke and Anthony Onwuegbuzie. 2004. "Mixed Methods Research: A Research Paradigm Whose Time Has Come." *Educational Researcher* 33(7):14-26.
Stage, Frances K. 2007. "Answering Critical Questions Using Quantitative Data." *New Directions for Institutional Research* 133:5-16.

Required Equipment:

Text: There is one required textbook for the course:

Gordon, Rachel. 2019. *Applied Statistics for the Social and Health Sciences*. New York: Routledge. 2nd Ed.

Note that *THIS BOOK HAS NOT YET BEEN RELEASED. WE WILL PROVIDE A COPY TO YOU BECAUSE YOU CANNOT BUY ONE*. Throughout the semester, I will supplement this textbook with other readings that will be available on the course website.

Calculator: You will need a calculator that can add, subtract, multiply, divide, and take square roots. It is wise to bring this device to class every day because we will do many in-class activities that require them. **During the midterm, you cannot use a device that communicates with other devices (such as a cell phone) as your calculator. You also may not bring to class a Texas Instruments TI-type calculator on the midterm day.**

Assignments and Grading:

Your course grade will be based on the following:

- **Homework (49%)**
  There will be 7 homework assignments throughout the semester, each worth 7 points. These homeworks will require statistical calculations, but more importantly, they will help me assess your sociological interpretation of statistical data. Each homework will be posted on the course website. All assignments are due at 11:59pm on the due date and must be turned in on the course website. Late homework assignments will be accepted up to 2 days after the due date, and 20% will be deducted from your assignment grade for each day it is late. Homework that is more than 2 days late will not be accepted. For the final grade, your lowest homework score will be dropped, and your highest score will be doubled.

- **Midterm Exam (11%)**
  There will be one midterm exam administered over the course of the semester. The midterm will help me gauge if students are understanding the theory and practice of statistics. The exam may include a variety of question types such as multiple-choice, fill-in, and problems requiring calculation

and interpretation. Questions may cover concepts, by-hand calculations, or interpreting STATA output. You will be allowed to use one page (8.5 x 11 inch double-sided) of notes during the exam. No make-up exams will be administered except under extreme circumstances and with approval _prior to_ the scheduled examination time.

- **Final Paper (30%)**
  By the end of the semester, you will have the skills to conduct statistical analysis and interpret results. You should also be able to write up your interpretation of results and convincingly connect your findings to a sociological research question. Your final paper will be a 10-page, double-spaced piece written in the style of an academic journal article that uses quantitative data. You will use standard margins, and the 10 pages must include at least two tables and/or figures that help establish your point. No late final papers will be accepted. You are allowed to use any cross-sectional (i.e. one point in time only) data set from either the GSS, IPUMS, or Social Explorer. To help you prepare for the final paper, you will have to turn in a final paper proposal, outline, and introduction throughout the semester, on which you will receive feedback.

- **Final Presentation (10%)**
  Prior to turning in your final paper, you will give a 5-minute talk about your paper to the class in the style of a conference presentation. You can incorporate the feedback you receive when you write your final paper. You will be graded on the rigor of your sociological argument and your ability to discuss statistical analyses. Makeup presentations will only be allowed for extreme circumstances.

Academic Accommodations:

The University of Illinois at Chicago is committed to maintaining a barrier-free environment so that students with disabilities can fully access campus programs, courses, services, and activities. Students with disabilities must inform the instructor of the need for accommodations. Those who require accommodations for access and participation in this course must be registered with the Disability Resource Center. Please contact DRC at 312/413-2183 (voice) or 312/413-0123 (TTY).

Things You Should Do to Succeed in This Class:

This course tries to engage you in active rather than passive learning. That means it is not a standard lecture course. You will be expected to participate in activities and discussion in class. The following things will help you to succeed in this kind of course:
1. Read and study the assigned sections of the text _before_ class. This is where you will learn the content of the course.
2. Come to and participate in class and laboratory section. This is where you will learn how to use the content in the textbook as well as the skills needed to do your final paper.
3. Do homework assignments soon after class. Doing assignments soon after you have read the textbook and participated in class activities will help solidify your learning and ensure better retention.
4. Most importantly, ASK QUESTIONS. If you are confused, others likely are too. You will be doing your classmates a favor, and make it easier to keep up, by asking the question early.

Class Rules:

1. Maintain a good learning environment by:

- entering quietly and politely if you happen to arrive late
- turning off the ringers on your cell phones and any other devices
- avoid loud eating or talking
2. Respect your class partners by:
   - pulling your weight during in-class group assignments
   - listening carefully to other students, the TA, and the instructor.

Academic Honesty:

All students are expected to do their own work on all assignments and exams. Students representing the work of others as their own or cheating in any other way will receive a zero for the assignment in question and may fail the course or be referred to the college for disciplinary action.

Schedule of Topics and Required Readings:

Dates listed below are subject to change. Changes will be announced in class and/or the class website. All readings that do not come from the textbook will be provided on the class website.

Dates	Topics	Required Reading	STATA Lab	Notes
8/27	INTRO…WHERE DO DATA COME FROM?		Variables & Crosstabs	
8/29	TYPES OF VARIABLES & TABLES	Gordon, Ch. 1 & 2		*HW1 due on 8/31*
9/3	GRAPHICAL TECHNIQUES	Kastellec and Leoni (2007)	STATA Graphics & Descriptive Statistics	
9/5	DESCRIPTIVE STATISTICS	Gordon, Ch. 3		*HW2 due on 9/7*
9/10	PROBABILITY & THE NORMAL DISTRIBUTION	Gordon, Ch. 4	Central Limit Theorem & Probability Distributions	
9/12	CONFIDENCE INTERVALS	Agresti, Ch. 5 "5 Key Things…Polls"		
9/17 to 9/19	SIGNIFICANCE TESTS	Agresti, Ch. 6	Confidence Intervals	*HW3 due on 9/23* *Final paper topic due on 9/21*

9/24 to 9/26	THE T-TEST & TWO-GROUP COMPARISONS	Agresti, Ch. 7	t-Tests	
10/1	CHI-SQUARE TEST	Gordon, Ch. 5	Chi Square Test & ANOVA	*HW4 due on 10/7*
10/3	ONE-WAY ANOVA			
10/8	REVIEW FOR MIDTERM EXAM		Midterm Review	*No class on 10/10*
10/15	MIDTERM		*No Lab This Week*	*No class on 10/17*
10/22 to 10/24	CORRELATION & BIVARIATE REGRESSION	Gordon, Ch. 6 Mahoney (2001:575-585) Morgan & Winship (2015:3-14)	Correlation, Regression	*HW5 due on 10/28*
10/29 to 10/31	MULTIPLE REGRESSION	Gordon, Ch. 7, 8, & 9	Multiple Regression	*Final paper outline due on 11/2*
11/5	REGRESSION DIAGNOSTICS	McCloskey and Ziliak (1996) Osborne and Overbay (2004)	Regression Diagnostics, Categorical Predictors	
11/7	CATEGORICAL PREDICTORS IN REGRESSION	Messner (1983)		*HW6 due on 11/11*
11/12 to 11/14	LOGARITHMS AND POLYNOMIAL TERMS	Williams (1984)	Logarithms & Polynomials	*Final paper Intro due on 11/16*
11/19	MODERATION/INTERACTIONS	Gordon, Ch. 10	Interactions & More Regression Diagnostics	
11/21	CAUSALITY, ROBUSTNESS CHECKS, AND WHAT TO DO WITH AMBIGUOUS RESULTS	McShane et al. (2019)		*HW7 due on 11/25* *No Class 11/26*

11/28	*THANKSGIVING*		*No Lab This Week*	*No Class*
12/3	FINAL PRESENTATIONS		Final Paper Review	
12/5	FINAL PRESENTATIONS			
12/9	**FINAL PAPER DUE AT 11:59pm**			