SOC 401: Sociological Statistics

Syllabus, Fall 2018

Meetings	3:00 – 4:15 on Mondays and Wednesdays
	4102 Behavioral Sciences Building
Instructor	**Mahesh Somashekhar**
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	Office: 4170 Behavioral Sciences Building
	Office Hours: 9:30 – 10:45 on Thursdays, and by appointment
Teaching Assistant	**Rebecca Abbott**
	Sections: AB1
	OH: 1:00 – 3:00 on Mondays, 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 midterms and exams, 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 exam days.**

Assignments and Grading:

Your course grade will be based on the following:

- **Homework (30%)**
  There will be 10 homework assignments. Each will be posted on the course website. All assignments are due on Saturdays at 11:59 pm 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 score will be dropped, and your highest score will be doubled.

- **Midterm 1 (10%) and Midterm 2 (10%), and Final Exam (25%)**
  There will be three exams administered over the course of the semester, two midterms and one final. The midterms will be non-cumulative, but for the final, you will be tested on material covered during the full semester. Exams will include a variety of question types including multiple-choice, fill-in, and problems requiring calculations and interpretation. You will be allowed to use one page

(8.5 x 11 inch double-sided) of notes during each exam. No make-up exams will be administered except under extreme circumstances and with approval _prior to_ the scheduled examination time.

- **Final Project (25%)**
  By the end of the semester, I expect you to turn in a one-page brief summarizing the major findings of a statistics-based research project. The brief should be written in the style of a Policy Brief from the _Journal of Health and Social Behavior_ (http://www.asanet.org/research-and-publications/journals/journal-health-and-social-behavior/journal-health-and-social-behavior-policy-briefs). Your topic does not need to be health-focused, but it does need to include these major components: Title, Research Problem & Data (which includes a research question, hypotheses, and a data description), Key Findings, Sociological Implications, and two tables or figures. You choose your own research question as well as the data set that you will analyze. Your brief must reflect the use of at least one statistical technique from the class, and I will grade you on substance, not style. In addition to reinforcing concepts and methods learned in the class, laboratory time will provide you with the opportunity to conduct analysis in STATA for your policy brief.

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 project.
3. Do homework assignments soon after class. Doing assignments soon after you have read the textbooks 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, TAs, 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	Due Dates and Notes
8/27	Introduction to Statistics and Research Design	Gordon, Chs. 1 and 2	
8/29	Producing Data: Surveys, Sampling, and Experiments	Diez, 1.1 – 1.5	*No Class on Labor Day, 9/3*
9/5 to 9/10	Introduction to STATA	Gordon, more of Ch. 2	
9/12	Graphical Techniques & Frequency Tables	Gordon, Ch. 3	*Bring an Example of a Good Graph or a Bad Graph to Class on 9/12* Assignment 1 due by 11:59 pm on 9/14
9/17 to 9/19	Measures of Central Tendency and Variability		Assignment 2 due by 11:59 pm on 9/21
9/24	Probability	Illowsky, 3.0 – 3.3, 4.1	
9/26	Normal Distributions	Gordon, Ch. 4	Assignment 3 due by 11:59 pm on 9/29
10/1	Review or Jump Start to Next Section		
10/3	**MIDTERM #1**		
10/8	Sampling Distributions		
10/10	Confidence Intervals		Assignment 4 due by 11:59 pm on 10/13
10/15 to 10/17	Hypothesis Testing for One Sample		Assignment 5 due by 11:59 pm on 10/20
10/22	t-Distributions		

10/24	Hypothesis Testing for Two Samples	Diez, 5.2 – 5.3	Assignment 6 due by 11:59 pm on 10/27
10/29	Review or Jump Start to Next Section		
10/31	**MIDTERM #2**		
11/5 to 11/7	Scatterplots and Correlation	Gordon, Ch. 5	Assignment 7 due by 11:59 pm on 11/10
11/12	Bivariate Regression	Gordon, Ch. 6	
11/14 to 11/26	Multivariate Regression		Assignment 8 due by 11:59 pm on 11/17 *No Class on 11/21. Happy Thanksgiving!*
11/28 to 12/3	Two-Way Tables & The Chi-Square Test		Assignment 9 due by 11:59 pm on 12/1
12/5	Review (And a Heart-to-Heart Conversation about Why Real Statistical Significance ≠ *p*-values)	McShane et al. 2017. "Abandon Statistical Significance."	Assignment 10 due by 11:59 pm on 12/8
12/10	**FINAL EXAM, BSB 4102, 8:00am to 10:00am**		
12/11	**FINAL PROJECT DUE AT 11:59pm**		