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Statistics for Social Research
SOCY 392
Fall 2022

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Class Times and Locations:
Lectures: Twice a week – Tues. and Thurs. from 11:40a-12:30p
Lab sessions: Thurs. from 2:50-3:40p or Fri. from 10:50-11:40a
Office Hours: Tues. from 12:45-2:00p; by appointment
TA Office Hours: xxx

Course Description

How do social researchers collect, analyze, and judge quantitative evidence? This question frames the central topics of this course. The core goals of the class are to teach you the logic behind quantitative sociological research, and to introduce you to strategies that social scientists use when they conduct statistical analyses. The semester will proceed in three parts that build on each other. Part I will cover the logic of quantitative inquiry, the philosophy of research design, and basic topics in probability related to this philosophy. Parts II and III will cover a set of statistical approaches that builds on these basic principles. In Part II, you will learn about ways to *describe* and visualize data. In Part III, you will learn about statistical tests that researchers use to make *inferences* about the relationships between different variables, and whether a relationship is "causal." By the end of the course, you will be able to conduct your own basic quantitative social science research, and will have the skills necessary to assess and critique basic statistical analyses conducted in research, reported in the news, or posted online.

Lectures and Labs

The lecture sections of this course will include both activities about and demonstrations of statistical analyses, and explorations of the philosophy and mathematical principles that underpin them. You are responsible for the material discussed in the lectures, and for information I provide in any announcements made during class time. Note that the content of this course, unlike some more substantive topics in sociology, builds on itself. The cumulative nature of this course makes attendance and participation essential. Each lecture period will include an

assignment or activity that I will grade – typically for completion. The goal of these assignments is to encourage you to show up and participate actively, and to provide me with data about topics that people understand well or are struggling with (which will help me tweak lectures, labs, and assessments).

In the lab sections of this course, you will use a statistical programming language (R) to apply the lessons you learn in the lecture, in service of completing a weekly problem set. You will complete each problem set with a partner who I randomly assign each week. Your TA will walk you through the basics of each assignment, answer clarifying questions, and help you troubleshoot any coding bugs. Please note that learning a programming language is not a simple task: it takes time and *personal* effort to fix a bug or correct a line of code. As a general rule (especially after the first few weeks of class), always spend at least five minutes on Google, Stack Overflow, or with your partner to see if someone has already answered your question *before* asking your TA or emailing me. We will always ask you what you tried to do to solve the problem yourself before coming to us.

Active Learning Norms

Research in cognitive science and education shows that listening to someone talk for 50 minutes is one of the least effective ways to learn. As such, all lectures will involve some form of active learning strategy. Come prepared to think through examples, apply basic lessons from the reading to new situations, and make arguments in favor or opposition of certain analyses and research designs in person.

Research also shows that many talented students can sometimes experience "math anxiety." When students have anxiety about mathematical concepts, the anxiety itself can prevent students from succeeding – *not* their intellectual ability.

Because of this, I want to emphasize three norms that the semester will center around. First, **be patient** with yourself and with others. Please know that you are absolutely capable of being successful in this class. Some topics will take you more time to learn than the person next to you, and vice versa. Second, **take risks** by participating. I encourage you to get excited by mistakes. I will call on students at random to provide answers to questions and to explain their reasoning behind their answers. If and when you share a wrong answer, know that you are sharing how a good idea led to an incorrect result, and allowing an entire classroom to understand how to get the right answer next time. Third, **teach each other**. The best way to really master content is to know it so well that you can get someone else to understand it. When you are participating in a group activity or working on a team project outside of class, try to make sure that everyone in the group is able to answer the question or solve the problem. Trying to figure out how to lead someone to understand a topic is obviously helpful for them – but it's also very helpful for you.

Grades

In line with the norms above, the grading system used in this course is designed to reward effort, curiosity, and active participation over right answers – because right answers and good ideas come from effort, curiosity, and active participation.

Item	% Of Grade
Reading Quizzes	10%
Homework	10%
In-Class Activities	15%
Lab Problem Sets	15%
Part I Test	10%
Part II Test	10%
Part III Test	10%
Final Exam	20%

More details about each item above:

- **Reading Quizzes**: you will read an excerpt from the course textbook or watch a video prior to every lecture. This material will prepare you for the lecture's content. Every class will begin with a 2-minute "quiz" about the reading or video. The "quiz" is really just an opportunity to hold yourself accountable to the efforts that are expected outside of class. It will typically involve reacting to the material. If you are not in class on-time, you will not be able to complete the reading quiz for that lecture. I will drop your four lowest reading quiz grades.
- **Homework**: prior to the Thursday lecture each week, you will submit your answers to a set of questions related to the content from Tuesday's lecture and the reading for that week. The questions will typically come from the course textbook. They must be submitted via Google Forms by 10:00pm on Wednesday of each week to be counted for credit, and are graded for completion. I will drop your four lowest homework grades.
- **In-Class Activities**: during most class periods, I will ask you to provide answer to a question with a partner, complete a task in a group, correct an error, argue in favor or against a decision made by a researcher, etc. All activities will include a submitted answer or response via Google Forms, which will contribute to your in-class activities grade. These activities will be graded based on effort and completion unless otherwise specified. I will drop your lowest two in-class activity grades.
- **Lab Problem Sets**: you will be assigned a brief problem set to complete every week during your lab period. The problem set will be completed in pairs that I assign with the TA. Problem sets are due every week by Monday at 10:00pm, and are graded for both effort and accuracy. I will drop your lowest lab problem set grade.
- **Part I, II, and III Tests**: these assessments will occur in person on the days shown in the schedule on this syllabus.

- **Final Exam**: the capstone test in this course will emphasize content taught in the latter half of the semester. The final exam date will follow the University's schedule.

Policies on Late Assignments, Attendance, Etc.

Reading quizzes and homework assignments are informal assessments that I use to guide my instructional planning, and to encourage you to earn "easy" points while making an effort to understand the content of this course. In-class activities serve a similar purpose. Because of this, *I cannot accept them late*. If you miss a reading quiz because you are running late to class or sick, you cannot make it up. Likewise, you will not receive credit for any homework assignment you submit past the 10pm deadline on Thursdays. That being said, I know things get busy, and sometimes we all run late or miss a class. As such, I will drop the four lowest homework grades and reading quiz grades. I will drop the lowest two in-class activity grades for the same reason. See me ahead of time if you are on an athletics team and know that game travel will interfere with your ability to attend specific lecture or lab dates.

Lab problem sets are an immensely valuable learning tool. Do your very best to complete them early or on-time. If something comes up and you need extra time, email both me and Chang-Yi. I will typically dock problem sets 15% for every day after the deadline until you submit your assignment. By Tuesday, the best possible grade you can earn is 85%; by Wednesday, 70%; and so on. Please be proactive, and use our office hour times to get help when you have questions.

As mentioned before, attendance is crucial for success in this course. It is required, and baked into the reading quiz and in-class activity grades.

In general, I encourage you to be proactive about potential concerns and to plan ahead. If you believe that you will not be able to complete an assignment on-time, emailing me several days before it is due instead of the night of the deadline will be helpful to me, and may be beneficial to your grade – it may allow us to work something out.

Lecture Schedule

Blah blah blah

Date	**Topic**	**Pre-Class Materials**
Aug 16.	Course overview + philosophy	<math anxiety video>
Aug. 18	The research process	USSR, pg. 2-14
Aug. 23	Types of data and how to obtain them	
Aug. 25	Summarizing and describing data (I)	
Aug. 30	(cont'd)	
Sept. 1	Summarizing data in R	

Sept. 6	Part I Test	
Sept. 8	Probability theory	
Sept. 13	(cont'd)	
Sept. 15	Probability in R	
Sept. 20	The Central Limit Theorem	
Sept. 22	Part II Test	
Sept. 27	One sample statistical tests	
Sept. 29	Confidence intervals	
Oct. 4	Two-sample tests and intervals	
Oct. 6	Two-sample tests and intervals in R	
Oct. 11	Chi-Square tests	
Oct. 13	FALL BREAK	
Oct. 18	Analysis of Variance (ANOVA)	
Oct. 20	Chi-Square vs. ANOVA	
Oct. 25	Correlation	
Oct. 27	Correlation and bivariate regression	
Nov. 1	(cont'd)	
Nov. 3	Part III Test	
Nov. 8	ELECTION DAY	
Nov. 10	Causality	
Nov. 15	(cont'd)	
Nov. 17	Multiple regression basics	
Nov. 22	(cont'd)	
Nov. 24	THANKSGIVING BREAK	
Nov. 29	Multiple regression extensions	
Dec. 1	Multiple regression in R	
TBD	Final exam	