

QUANTITATIVE SOCIOLOGICAL METHODS
(SOCIOLOGY 106)
SPRING 2018

Professor Mao-Mei Liu

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Class: Thursdays 8-10am, Barrows 475

Office hours: MW 9-10am ([sign-up](https://www.wejoinin.com/sheets/vzfqm) at <https://www.wejoinin.com/sheets/vzfqm>)

Th 10am-12noon (drop-in), Barrows 477

Course Description and Goals¹

Sociology 106 is an intermediate undergraduate sociology research methods course. It will emphasize the motivation, computation, and interpretation of statistical tests for one or two continuous or categorical variables. The course will also introduce students to the R statistical programming language for data management and analysis. Sociology 106 is most appropriate for social science undergraduates who have some familiarity with sociological research methods and wish to learn how to carry out a quantitative research project.

Classroom time will usually include both a lecture and a laboratory component. During the first hour of class, the instructor will introduce the relevant statistical and research methods concepts and tools for the week. The second hour of class will consist of a research methods practicum or data analysis practicum in which students will learn how to apply statistical techniques to data analysis using R. By the end of the semester, you should be able to:

1. Understand the basic logic of statistical inference
2. Identify the appropriate statistical test given a specific type of data
3. Visualize data and produce descriptive statistics and simple statistical tests using R
4. Interpret the results of statistical tests and discuss their relevance in the context of a particular research question
5. Begin to consume, interpret and produce quantitative sociology

Prerequisites

Previous training in statistics is neither required nor expected. Successful completion of Sociology 5 is a requirement for this course, but other courses that introduce social science

¹ I am very grateful to Jacob Habinek for his original course design of Soc 106 and to Professors David Harding and Jill Bakehorn for sharing their syllabi of Soc 271B and Soc 105, respectively. My syllabus builds on Habinek's syllabi, and borrows many of the course policies, general guidelines from Harding and Bakehorn's syllabi.

research design and methods may suffice. If you have not taken Sociology 5, contact the instructor to obtain permission to enroll.

Required course materials

There are no required readings for the course. The recommended textbooks are:

Alan Agresti & Barbara Finlay, *Statistical Methods for the Social Sciences*
Jane Miller, *The Chicago Guide to Writing about Numbers* (2nd edition)
also, David Lane, *Online Statistics* (<http://onlinestatbook.com/>)

You are not required to read anything from the textbooks before lectures. We will go over all concepts in lecture first. Agresti & Finlay offer in-depth explanations and practice problems within and at the end of each chapter, while Lane provides brief explanations. Use these texts to help you consolidate, review and practice the statistical concepts introduced in lecture. The Miller book is intended to help you complete the data analysis assignments and the individual research milestones.

You are required to have a laptop that can access the internet to take this course. In order to complete the assignments, you will be downloading, installing, and using statistical computing software, as well as finding data on the web. If you wish to take this course and do not have access to a computer, please speak to the instructor immediately.

Course Requirements

The course involves the following activities:

Active participation during lectures and workshops (10% of your final grade): Class time is your chance to learn the concepts of the course, as well as how to implement the R commands, data management skills, and workflow strategies you will need to complete the assignments. I expect you to be an active participant in the course. All phones must be silenced and put away during class. Please take hand-written notes if you are able (research finds that students learn more). While you may not agree with everything we read and discuss, I do expect you to keep an open mind, nurture your sociological imagination, and communicate respectfully.

Weekly homework (20%): Assignments will involve both hand calculations and write-ups, and, during most weeks, data analysis in R. You may collaborate on these assignments with other students but each individual must write up their own work in their own words and submit their own R output; copying is plagiarism and will be treated as such. Homework assignments will be due by 6pm on bCourses the night before class; late homework will not be accepted. These

assignments will be graded on a pass/no pass basis.

Individual Project (40%): Each student will develop and present a research question of their choice and address it by using the descriptive and inferential techniques presented in the course. The final paper (30%) will build on the weekly data analysis assignments and research methods labs. There will be (at least) two milestones to scaffold your progress towards the final paper: a preliminary proposal (due Thursday, Feb 22 at 6pm) and the research workshop (Thursday, April 19 at 8am).

Final Paper (15-20 pages) Due Monday May 7 at 6pm

Each student will write a final paper that uses statistical methods from the course to examine one or more theoretically motivated hypotheses. Present your research question and explain its importance. You should state what you hope your research will uncover (working hypotheses) and why your results might be significant. Introduce the data & research methods. Then present and discuss your evidence gathered using the descriptive and inferential techniques presented in the class. The final prospectus should be 10-15 pages in length (typed, double-spaced; cover page, figures, tables and references excluded) and should include: an introduction (what is your problem and why should we care about it); a brief literature review; a description of data & research methods; preliminary results that include descriptive and inferential statistics and a discussion of these results. You should also include citations where appropriate as well as a full bibliography (consult the ASA style guide).

Midterm and Final Exams (15% each): There will be two exams. Exam questions will be similar to weekly homework assignments and problems in Agresti & Findley, except that you will not be asked to analyze data using R. They will evaluate your ability to set-up statistical tests, interpret their results, as well as skillfully and critically consume real quantitative sociology. Comprehensive in nature, exams will be closed book, although you will be permitted a crib sheet. Make-up exams are only given when the circumstance clearly warrant, and then only when the student has given the instructor advance notice of their absence. The midterm exam is scheduled for Thursday, March 8 at 8am, and the final exam is scheduled for Thursday, May 10 at 7pm.

Course Policies & Support Resources

Office Hours I encourage you to come to office hours. Office hours are a good time to introduce yourself, talk about ideas you are thinking about, and discuss problems you may have with class. I'll hold office hours Mondays/Wednesdays 9-10am ([sign-up](https://www.wejoinin.com/sheets/vzfqm) at <https://www.wejoinin.com/sheets/vzfqm>) and Thursdays 10-12noon (drop-in).

Grading No late assignments will be accepted without prior approval. All assignments will be checked by TurnItIn. Carefully consider and respond to my feedback; I provide it to help you improve.

Academic Rigor & Honesty The UC Berkeley Honor Code states that “As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others.” (<http://asuc.org/honorcode/index.php>). I expect you will follow these principles. You may not copy specific text or ideas from others, whether from fellow students, from authors of our readings or other material you find, without specific attribution. To do otherwise is to plagiarize. As a student of the University of California, you are bound by the Code of Academic Conduct.

Email Please clearly indicate our class in the subject line (e.g. “SOC 106 Quantitative Sociological...”). I endeavor to respond to emails within 24 hours, but this is not always possible; please be patient.

ADDITIONAL SUPPORT SERVICES

Disability Accommodations If you qualify for any disability accommodations, please let me know early in the semester so you can receive the accommodations to which you are entitled. <http://dsp.berkeley.edu>

Student Learning Center Provides support for writing, various academic disciplines including social sciences, as well as help for transfer and international students. <http://slc.berkeley.edu>

Mental Health and Wellness Resources A range of issues can cause barriers to learning and well-being, such as strained relationships, increased anxiety, alcohol/drug problems, depression, difficulty concentrating and/or lack of motivation. If you or someone you know is suffering, consider utilizing the confidential mental health services available on campus (<https://uhs.berkeley.edu/counseling>). If you have an urgent problem, call the Tang Center 24/7 Counseling Line at (855) 817-5667 and/or text 741741 to communicate with a trained Crisis Counselor via Crisis Text Line (<https://www.crisistextline.org/>)

Sexual Harassment and Violence Support Services To learn more about these issues, how to support survivors, or how to file a report and receive support services, start here: <http://survivorsupport.berkeley.edu>. Please note that I am not a confidential advocate. To speak to a confidential care advocate: <http://sa.berkeley.edu/dean/confidential-care-advocate>

Data Resources

In this course, you will work with one (or more) datasets of your choosing in weekly assignments and the final paper. You may use any data that you like, and are encouraged to consult with the instructor as you choose your data. Below are some online repositories where data are available:

sda.berkeley.edu/archive.htm

icpsr.umich.edu/icpsrweb/ICPSR/index.jsp

gss.norc.org/

thearda.com/Archive/browse.asp

census.gov

ropercenter.cornell.edu/

Keys to Success in Sociology 106

Since this is primarily a statistics course, it will be very different from the typical sociology course. Because most of the material is cumulative, it is essential that you keep up with the course material.

- The readings are relatively short, but they are dense and need to be read carefully.
- For most students, learning statistics requires thinking through how to solve problems. Statistics cannot be learned simply by reading a book or listening to a lecture. You should not expect to fully understand the material until after you have completed the relevant assignment.
- In some ways, learning statistics is in some ways like learning a language, and it is important not to be intimidated by new terms to represent quantities or concepts. It is often helpful to write in plain language the meaning of the quantities or concepts represented by a letter or symbol.
- The most effective way to study for the exams is to do practice problems. As such, the assignments are a critical part of the course. Please note that the Agresti and Finlay textbook includes answers to many odd-numbered questions; if you feel that you do not adequately understand some part of the material, these may help you to work through it. You are strongly encouraged to do homework assignments and study for exams in groups.
- Lecture slides will be made available, but are not a substitute for careful note taking.
- If you find yourself falling behind, seek help *immediately* from the professor during office hours.
- Please ask questions during lecture or during lab if you do not understand. If something is unclear to you, it is probably unclear to other students as well. Lectures and labs are planned to allow time for questions and answers.

Schedule

Week	Date	Topic	Agresti & Finlay	Lane
Part I: Asking sociological questions & Describing data				
1	1/18	Introduction	Ch 2.1	Ch 1.f, 1.h
2	1/25	Asking sociological questions, Statistical computing and finding data	---	---
3	2/1	Visualizing distributions (+ Tufte)	Ch. 3.1	Ch. 2.a, b.2, b.4-7
4	2/8	Summarizing distributions	Ch. 3.2-3.6	Ch. 3.a-b
Part II: Thinking about probability and sampling				
5	2/15	Probability & Probability Distributions	Ch. 4.1-4.3	Ch. 4.a-e, Ch. 4.g-h, Ch. 7.a-e
6	2/22	Sampling distributions PRELIMINARY PROPOSAL DUE by 6:00pm	Ch. 4.4 – 4.7	Ch. 8.a-e
Part III: Doing statistical inference and Testing hypotheses				
7	3/1	Estimates and confidence intervals	Ch. 5	Ch. 10.a-e.4
8	3/8	MIDTERM	---	---
9	3/15	Hypothesis testing & Analysis of variance	Ch. 6, Ch. 12	Ch. 11.a-i, Ch.12.a-c, Ch. 15.a-c
10	3/22	Associations & Chi-square test	Ch. 8	Ch. 17.a-e
11	3/29	<i>No Class: Spring Break</i>		
11	4/5	Linear regression	Ch. 9	Ch. 14.a-e
12	4/12	Logistic Regression		
End of class: Workshop, Review and final exam				
13	4/19	RESEARCH WORKSHOP	---	---
14	4/26	<i>No Class</i>	---	---
15	5/3	REVIEW SESSION	---	---
	5/7	FINAL PAPER DUE BY 6:00pm	---	---
16	5/10	FINAL EXAM	---	---