SOC6302H: Statistics for Sociologists

Fall 2017
Lecture: Fridays, 10 am – 12 pm
Lecture Location: Room 240
Lab: Fridays, 12 pm – 1 pm
Lab Location: Room 36

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Office hours: by appointment

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Course Description

This class is designed to help you traverse the entire gamut of data analysis, from conceptual understanding of statistical methods to practical application, so that you can become a savvy consumer of statistical information and be able to start answering your own questions. To that end, lectures and discussions will be interspersed with exercises and assessments designed to aid learning and retention, and students will participate in a lab tutorial each week.

Course Objectives

You will…

- learn the basic concepts and skills needed to begin answering research questions using quantitative data
- apply these concepts and skills to answering research questions
- learn to use statistical software for statistical analyses

Textbooks and Other Materials

The textbook for the course is:

Agresti, Alan and Barbara Finlay. 2009. *Statistical Methods for the Social Sciences*, 4th ed. Upper Saddle River, N.J.: Pearson-Prentice Hall.

There are a number of texts out there that teach Stata, but everything you will need to know will be taught in lab. For additional information (or reference in case you forget something) you can consult the following resources:

http://www.ats.ucla.edu/stat/stata/

Longest, Kyle C. 2012, 2015. *Using Stata for Quantitative Analysis* (1st or 2nd editions). [2012 edition available as a digital holding in U of T Libraries]

Statistical Software

All statistical analyses will be performed using Stata, which is available in the computer lab. It can also be purchased from www.stata.com. If you decide to buy Stata, be sure to select the student pricing, and purchase either Stata/IC or Stata/SE. If you already own a copy of Stata (any version), you may use that instead.

Calculator

You will need a scientific calculator. Please do not plan on using the calculator on your phone, as phones may not be used during class time due to their extremely high potential for distraction.

Class Format

The course has been designed to maximize your ability to learn, retain, and apply statistical concepts by drawing on principles gleaned from research on learning and the brain. In particular, it takes seriously the idea that brains need repetition by providing repeated opportunities to practice statistical skills.

Lecture time will be devoted to presenting statistical concepts. You should be prepared to take notes by hand, as laptops are not permitted during class (see section on classroom etiquette below). To help you focus on learning the material rather than scrambling to take notes, simplified versions of lecture slides will generally be posted prior to lecture. It is recommended that you print a copy of these slides and bring them with you to lecture to take notes on. We will take a 10-minute break about halfway through each lecture period. Lectures will typically also include one or more in-class exercises designed to help you solidify key concepts and practice statistical skills. However, the real learning will occur outside of lecture periods as you participate in lab tutorials and complete readings and assignments.

Lab Tutorials

The goal of lab tutorials is to review material from lecture as needed, and learn to apply statistical concepts to real data problems using software designed for statistical analysis. Labs are led by the course TA, and will typically include an in-lab exercise to help you practice your data analytic skills.

Weekly Reading and Assignments

Reading assigned chapters from the textbook and completing assignments provide useful repetition and practice of concepts and skills presented during lecture.

Reading is intended as review, and therefore should occur *after* lecture, but before the following lecture. In this way, lectures can provide a framework that will help students better understand and retain the material they read.

Evaluation and Grading

Coursework is weighted as follows in calculating the final grade.

Weekly assignments	45%
Research briefs	30%
Final Test	25%

Final grades will be assigned using the grading scale below, taken from the University Assessment and Grading Practices Policy.

Percentage	Grade
90-100	A+
85-89	A
80-84	A-
77-79	B+
73-76	B
70-72	B-
0-69	Fail

Description of Evaluation Components

Weekly Assignments

There will be an assignment posted on Blackboard each week that will allow you to review key concepts and practice data analysis. Assignments will often include a computing component using Stata, the how-to's of which will be taught in lab sessions.

Assignments can be found under *Course Materials* → *Assignments*. When you open an assignment for a given week, you will see two things. The first is a PDF file of the assignment, including any instructions, labeled "Assignment # - questions," where # is replaced by the assignment number. The second is a link that allows you to submit your answers. *All answers must be submitted via this link* (unless otherwise noted in the assignment instructions).

Each week, a portion (or all) of the assignment will be graded by Blackboard, and so the score will be immediately available on Blackboard. Students who are not satisfied with their score are permitted to correct their work and resubmit it (one time only per assignment). Any corrections must be resubmitted by the original due date. Sections of the assignment that are graded by the instructor (not Blackboard) may be submitted only once.

Research Briefs

You will complete three research briefs during the course. The goal of each research brief is to give you a chance to apply the skills you've been learning to a question that is of interest to you.

What to Do

1. Find a topic that interests you, and come up with some aspect of that topic that you'd like to learn more about. For example, if you are interested in education, you might ask: "How much education do different types of people in Canada get?" Or you might ask, "Do different ethnic groups get different levels of education on average?" Keep in mind that you will need to be able to answer this question using techniques you've learned in class. This means that your question should be simple.
2. Find some data that will allow you to answer your question. A good place to start is the General Social Survey (Canadian or American). NOTE: If you are having trouble finding data, the easiest thing to do is probably to pick a new question, one that can be answered using the data you have access to.
3. Figure out which variables you will need to answer your question.
4. Determine which statistical technique you can use to answer your question.
5. Run the analysis in Stata.
6. Interpret the results. That is, what is the answer to your question? How do you know/what evidence do you have?
7. Write up the results in the Research Brief (see guidelines below)
8. Turn the Research Brief in
9. Celebrate your budding statistical prowess in a manner of your choosing

Specific Requirements

Research Brief #1 will need to use one or more techniques from chapters 1-5 of the textbook.

Research Brief #2 will need to use one or more techniques from chapters 6-8.

Research Brief #3 will need to use one or more techniques from chapters 9-11.

A Research Brief should be no longer than 2 pages, with normal (12 point) sized font. Often a single page will be sufficient.

Include at least one table, graph, or figure to help display your results.

Use the layout described below for your Research Brief (i.e., all the same headings in the same order).

Layout

Your Research Brief should include

- **Question:** a clearly worded question
- **Data:** a description of the data you are using, including a description of all variables and how they are coded
- **Plan of Analysis:** a description of your analysis (i.e., how are you going to use the data to answer the question?)
- **Results:** a presentation of the results, including a table/figure/graph

- **Discussion:** Provide an interpretation of the results – that is, given the results, what is the answer to the question? Are there any other possible interpretations? What limitations might there be in your data or analysis that affect how well we can answer the question?

Examples of Research Briefs can be found on Blackboard.

Links to submit Research Briefs can be found on Blackboard under *Course Materials* → *Research Briefs*.

Grading

Research Briefs will be graded as follows:

Score	Meaning
3	Excellent
2	Adequate
1	Needs attention

For the purposes of final grade calculation, scores on Research Briefs will be averaged and assigned the following values:

Score range	Grade	Numeric value
0	Fail	0
0-1	Fail	50
1-1.3	B-	71
1.4-1.6	B	75
1.6-1.7	B+	78
1.8-1.9	A-	82
2-2.4	A	87
2.5-3	A+	95

Final Test

The final test is a take-home affair designed to assess all of the skills developed during the course, with a particular focus on apply analytic skills to realistic research questions using real data. Students should therefore be able to

1) develop an appropriate plan of analysis for a given research question
2) perform the analysis
3) interpret the results

The test is open book and open notes, but should be completed individually (i.e., not discussed with other people). The weekly assignments and research briefs are designed to prepare you for the exam.

Course Schedule

All readings are from the textbook unless otherwise noted.

Week	Date	Topic	Reading (Agresti and Finlay)	Due this week (by the start of lecture)
1	Sept 15	Data – levels of measurement, variables, populations, samples, data quality	chapters 1-2	nothing
2	Sept 22	descriptive statistics	chapter 3	assignment 1
3	Sept 29	normal distributions	Moore et al 1.4	assignment 2
4	Oct 6	Dealing with Uncertainty – distributions as models of the world, probability distributions, sampling distributions	chapter 4	assignment 3
5	Oct 13	Dealing with Uncertainty –confidence intervals	chapter 5	assignment 4
6	Oct 20	Dealing with uncertainty – hypothesis testing; one sample tests	chapter 6	assignment 5 research brief #1
7	Oct 27	Dealing with uncertainty – more hypothesis testing; two sample tests	chapter 7	assignment 6
8	Nov 3	Analyzing data – measures of association for categorical variables, tables and chi-square	chapter 8	assignment 7
9	Nov 10	Analyzing data – covariance, correlation, and bivariate linear regression	chapter 9	assignment 8 research brief #2
10	Nov 17	Multivariate relationships – the logic of controls	chapter 10	assignment 9
11	Nov 24	Multiple linear regression and interaction terms	chapter 11	assignment 10
12	Dec 1	TBD		assignment 11 research brief #3
	Dec 12	Final test due by midnight		

Every attempt will be made to follow this schedule, but it is subject to change at the discretion of the instructor.

Procedures and Rules

Rounding

Unless otherwise specified, round all answers to 2 significant figures. This means to report the first two digits that carry any real meaning. For example, all of the following are rounded to two significant figures: 45.23, 0.34, 0.00044.

Late Work

All assignments are due by the beginning of lecture on the date listed in the syllabus. Assignment grades will be reduced by 10% for each day late. Assignments will not be accepted more than 1 week after the original due date.

Late penalties can be waived for a legitimate reason with proper documentation (e.g., illness, family emergency, religious observance, but NOT family vacations, weddings, I want a long weekend, etc.). Where possible, these arrangements must be made in advance of the missed work.

Grade Appeals

If you believe that a mistake was made in grading your work, you may appeal the grade by submitting a written explanation of why you think your mark should be altered to the instructor. The instructor will then re-grade your work with the additional information in mind. Although in most cases re-grading results in a higher mark, this is not guaranteed, and your mark might go down.

Academic Integrity

You are expected to abide by the University's standards of academic integrity, which can be found in the "Code of Behaviour on Academic Matters" (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm). Plagiarism or other violations will be addressed in accordance with University guidelines. Please be cautious in this matter, as the penalties for academic misconduct can be quite severe.

Working With Other Students

Working with other students is often a useful way to learn statistics. You are therefore encouraged (but not required) to work with other class members in completing assignments (including research briefs). However, each student must complete and submit his/her own work, written in his/her own words. Students who work together on class work should also indicate whom they worked with on each assignment (if anyone). These steps guard against situations where a student's academic integrity might be called into question (see section on Academic Integrity).

Classroom Etiquette

Students are expected to arrive at class on time. If you need to leave during lecture, please do so in a way that will minimize disruption of the class.

Laptop computer are not to be used during class time. *This means that you should be prepared to take notes by hand*. Notes may be taken on tablet devices, but these should not be used for gaming, checking email, or any of the many other things that might distract from classroom engagement. Cellphones should not be used during class time, and should be turned off or set to silent until class is over.

Attendance

Data analysis is a skill, and like any skill mastering requires time on task. Attendance is therefore mandatory at all lectures and lab tutorials. Any absences should be cleared with the instructor. More than two absences at either lecture or lab may result in a reduction in a student's final grade, usually one half grade per absence beyond the two (e.g., from A to A-). These grade reductions will be at the instructor's discretion.