Quantitative Analysis in Social Science Research

SOC202H1S – L5101

Winter 2016

Class Sessions: 5-7PM on Monday in SS-2118
Tutorial Sessions: 10-11:30AM on Thursdays; 1-2:30PM on Thursdays; OR 10:30AM – 12:00PM on Fridays in FE-36

Instructor:
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DESCRIPTION

Sociology is an empirical discipline. This simply means that we rely on observable data to make claims and to evaluate theories about how the world works. Statistical methods are an essential component of the methodological tool kit in sociology, as quantitative information is a common form of data for our discipline. Beyond its relevance for social scientific discovery, statistical reasoning will likely pay dividends as you move beyond university life. Indeed, understanding and interpreting data is an increasingly important skill in many professional fields. This course is intended to give you the basic skills to pursue work in a data-driven occupation.

This course provides an overview of common quantitative methods in sociology. The course begins with data description, focusing on the distribution of single variables. We then shift to the world of normal distributions, probability, sampling distributions, and statistical inference. The concepts are somewhat challenging and abstract, but they have important implications for our broader goal of statistical analysis: to make statements about the real world without having to study the entire population of interest.

Finally, we get to the point of testing hypothesis and documenting the strength of relationships between variables. As we will discuss, a hypothesis posits an association between two or more variables. This is a crucial aim of empirical sociology. We may want to know, for instance, whether people's social class shapes their political attitudes, whether criminal justice proceedings are affected by the gender of the defendant, whether highly diverse organizations are more innovative than less diverse organizations, or any other number of issues. Sociological theories help us predict these associations, but we need statistical tests to weigh the evidence one way or another. The type of test we use will depends on how those variables were measured, and so in the final weeks of the class we will move through an orderly sequence of statistical tools based on different types of variables.

Throughout the course, we will focus on the conceptual issues underlying statistical procedures and why these techniques aid us in understanding the social world. We will do many simple mathematical computations, but this is not a math class. Indeed, we will only presume that you have had basic high school math—no advanced mathematical training is necessary for this course. We will also practice doing statistics on SPSS, a user-friendly statistics program widely used in many fields and accessible to students at University of Toronto.

The mantra for this class is pretty simple: **<u>practice, practice, practice</u>**. Statistics is not a subject that comes naturally to most students. Most of us have to use a variety of techniques to feel comfortable with the material. Accordingly, this course will involve not only assigned readings and in-class lectures, but also regular homework assignments and lab work to reinforce the concepts through active engagement.

GOALS OF THE COURSE

There are three primary goals for this class.

- The course should help make us better consumers of social science research so that we can critically evaluate material in classes, in the media, and in matters of public debate.
- The course should aid our understanding of how quantitative evidence is used to support, challenge, debunk, or refine sociological theories.
- The course should build familiarity with conducting computerized statistical analyses with the SPSS program.

PREREQUISITE

The prerequisite to take this course is SOC101Y (or SOC102H and SOC103H) and SOC200H1. Students without this prerequisite will be removed at any time and without notice.

LEARNING COMPONENTS

(1) Class lectures

Class time will be used to emphasize key concepts found in the weekly reading and to work through examples to reinforce the material. Though attendance is not required, we highly recommend that you come to class each week. To really understand the content, it is helpful to interact with class material through multiple channels—first reading on your own, but then hearing and seeing the concepts explained in class, discussing the concepts with classmates and TAs, and practicing through the assigned homework. Further, statistics is not a course that you can easily cram for the day or two before a test; each week's material builds from concepts discussed the prior week. Coming to class regularly will help you maintain a productive rhythm throughout the semester.

(2) Textbook

This course will use the following text:

Healey, Joseph F. and Steven G. Prus. 2015. *Statistics: A Tool for Social Research*, 3rd Canadian Ed. Nelson Education Ltd.

The textbook is available in the U of T bookstore. **IMPORTANT**: with the purchase of the text ($105.95), you will receive a password for Aplia, the online system this class uses for homework assignments. You may also purchase an Aplia account bundled with an electronic book ($78.95), or the Aplia account without any textbook ($47.95).

(3) Lab/Tutorial Sessions and Use of SPSS

Lab/tutorial sessions for this class will be held in FE-36. The goal of these sessions is two-fold. First, you will learn to use the SPSS statistical program to apply your statistical skills to actual Canadian data. Teaching assistants will guide you through statistical exercises found in the Healey and Prus textbook, help you interpret the results, and help you begin your lab assignment. **Please bring along your textbook to lab**. There are three lab assignments; each is due in lab (on 28/29 January, on 10/11 March, and on 7/8 April). Each lab assignment consists of work conducted in lab during the preceding weeks. **Students must hand in a hard copy of the lab assignment on its due date**. A penalty of 5% points per work day will be assessed for late work.

Students are encouraged to finish their weekly lab work during the weekly lab/tutorial sessions, but you may find yourself needing extra time to complete the assignments. SPSS is also available on computers in the Robarts Map and Data Library (5th floor of Robarts Library). This computer lab is open most hours during regular Robarts Library hours (8:30a-10:45p). There are some hours in which the lab is booked for special events, so please check the weekly schedule (posted by the lab doors) if you plan to drop by and use a computer there. Unfortunately, the library does not post weekly hours online. You can, however, use this website to identify whether there are free computers in the Map and Data Library (http://caf.icicle.utoronto.ca/CAFStatus/Web/Map/Robarts_05)

The second goal of the lab/tutorial sessions is to provide an opportunity to dialogue with teaching assistants and with fellow classmates about concepts that are unclear to you. The lab/tutorial sessions immediately preceding mid-term tests and the final exam (i.e., sessions on 28/29 January, 10/11 March, and 7/8 April) will be used exclusively as a review session; there will be no SPSS lab work during those weeks. Rather, students are encouraged to ask questions about concepts that will be featured on the tests.

There will be no lab/tutorial during weeks in which a test is given. That is, **there will be no lab on 4/5 February or 17/18 March.**

(4) Weekly homework assignments

To reinforce course material, students will be required to take weekly homework assignments. These assignments will be available at 9a each Tuesday and can be completed until 11:59p each Thursday. That is, you will have a 63 hour window in which each assignment can be completed.

No homework will be assigned during weeks in which mid-term tests are given. That is, there will be **no homework assigned the week of <mark>1 February or 14 March</mark>**.

To complete the homework, you must first create an online account through the course website at **http://login.cengagebrain.com/course/E-X7FGYM9ES4Q7Z**. You must have an access code from the textbook to register your account. Each week a homework assignment is given, you will log in using the ID and password you created during online registration. The website will contain an assignment consisting of 10-15 questions. After answering the questions, you will receive immediate feedback on your performance—i.e., you will know which questions were correct and which ones were incorrect. You will then be given a second opportunity to take the assignment. Your mark for the assignment will be based on the higher of the two attempts.

Because there is such large window of time during which assignments can be taken (9a Tuesday – 11:59p Thursday = 63 hours) and because assignments can be taken anywhere where an internet connection is available, there are no opportunities for make-up assignments. Each individual homework assignment is worth only a small fraction of your final mark (1.5%), so missing one or two home works will not have a drastic impact on the overall mark calculation.

(5) Tests and Final Exam

Two mid-term tests will be given. The first, on 1 February, will consist of material from classes 1-3. The second test will be given on 14 March and will consist of content covered in classes 5-8.

Each test will consist of 30 multiple choice questions and five open-ended questions. You will have 1 hour and 50 minutes to complete the test. Simple calculators with a square root function will be needed on the test, but you may not use any type of phone as a calculator. Please bring your student identification. Also, make sure that you have several pencils and pens in case one or more of your writing instruments stops working.

A final exam will be given during the final exam period in April. The final exam is cumulative—it will cover material from classes 10-12, but also from the material featured on the two mid-term tests. The final exam will consist of 40 multiple choice questions and seven open-ended questions. You will have 3 hours to complete the test. Once again, please bring a calculator—but not a phone—and your student identification.

EVALUATION COMPONENTS

	Number of occasions	Percent value	Total percent of final mark
Homework assignments	10	1.5% each	15%
Lab assignments	3	5% each	15%
Mid-term tests	2	22.5%	45%
Final exam	1	25%	25%
			100% (total)

LATE WORK AND MISSED DEADLINES

Homework assignments can be completed from anywhere with an internet connection and anytime between 9a on Tuesdays and 11:59p on Thursdays, so there are no make-ups offered for these assignments. Lab assignments are collected during tutorials on their due date and the test should be taken as scheduled. The only exception for either deadline is a legitimate, documented reason beyond your control (e.g., illness, family emergency). In cases where there is no legitimate reason for being late, a 5% penalty will be added for each workday that a lab assignment is overdue. Make-up tests will only be given for legitimate, documented absences. The **time scheduled for make-up tests is the _____ morning directly following the original test** during TA office hours (10a-12p in Sociology rm. 225). The only opportunity to make up midterm test 1, then, is {DATE}. The only opportunity to make up midterm test 2 is {DATE}.

Please notify me promptly if you must miss a deadline and provide official documentation as soon as possible. Under university regulations I am not required to give make-up tests or provide extensions if the student informs me of her/his circumstance more than 7 days after the missed test or assignment due date.

Three types of documentation are considered "official" when it comes to late work and missed assignments:

(1) A Verification of Student Illness or Injury form. This form is available at www.illnessverification.utoronto.ca. It must be completed by a physician, surgeon, nurse practitioner, dentist or clinical psychologist. No other documentation will be accepted. To protect your privacy, submit it in a sealed envelope addressed to the instructor. Please note that it is your responsibility to work ahead on your assignments, so a minor short illness days before the due date is not an excuse for lateness.

(2) A college registrar's letter. This documentation is useful in cases of personal or family crisis, or any other problem that is not possible to document through the Verification of Student Illness or Injury form.

(3) A letter from Accessibility Services. This documentation is useful for ongoing medical issues that require special accommodation.

SUMMARY OF DUE DATES

Component	Due Dates
Homework assignments	
Homework assignment 1	Due 11:59p 14th of January
Homework assignment 2	Due 11:59p 21st of January
Homework assignment 3	Due 11:59p 28th of January
Homework assignment 4	Due 11:59p 11th of February
Homework assignment 5	Due 11:59p 25th of February
Homework assignment 6	Due 11:59p 3rd of March
Homework assignment 7	Due 11:59p 10th of March
Homework assignment 8	Due 11:59p 24th of March
Homework assignment 9	Due 11:59p 31st of March
Homework assignment 10	Due 11:59p 7th of April
Lab Assignments	
Lab assignment 1	Due in tutorial on the 28th or 29th of January

	Lab assignment 2	Due in tutorial on the 10th or 11th March
	Lab assignment 3	Due in tutorial on the 7th or 8th April
In-Class Tests		
	Test 1	1st of February
	Test 2	14th of March
Final Exam		TBA

ACADEMIC INTEGRITY

Students are expected to know and adhere to the University's principles of academic integrity. Any act of plagiarism or other unethical behavior will be addressed in accordance with University guidelines. Please see the "Code of Behaviour on Academic Matters" (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm) for specific information on academic integrity at the U of T.

ELECTRONIC COMMUNICATIONS AND BLACKBOARD

The University of Toronto Blackboard system will contain the course syllabus, assignments, discussion board, and course announcements. Students are responsible for the content of all course materials and for checking their official utoronto.ca email address regularly. Emails sent to the utoronto.ca email address on file are deemed to have been received.

Questions about course content should be posted on the course discussion board on Blackboard, not sent by e-mail to the instructor or TA. The reason we encourage you to post your questions to Blackboard is that if a certain concept is unclear to you, chances are that many of your classmates are in the same boat. We find that it is effective to address content-related questions in a place where everyone can benefit from the information. There will be discussion boards available for the classes leading up midterm test 1, another discussion board for the classes preceding midterm test 2, and a third discussion board for final exam concerns. {NAME}, one of our course TAs, will be actively monitoring the discussion board and will respond to questions addressed to him there.

Here are a couple other important points about electronic communication:

- Please note that the instructor and TA will not respond to e-mails about issues that are clearly specified in the syllabus (e.g., due dates, office hour times)
- Requests for make-up tests or other accommodations should be sent to the course instructor (Schafer), not the TA
- All emails should include the course code SOC202 in the subject line, and be signed with the student's full name and student number.

GRADE APPEALS

The instructor and teaching assistants do their best to mark work fairly, consistently, and accurately. Nevertheless, one of us may unintentionally err in our marking duties. If you believe that your test or lab assignment has been mismarked, please adhere to the following rules:

- For basic mathematical errors, simply alert TA {NAME} of the error.
- In the case of more substantive appeals, you must wait at least 24 hours after receiving your mark. If you wish to appeal, please submit a thorough written explanation to Instructor Schafer of why you think your mark should be altered. If your appeal is deemed appropriate, the entirety of your test/assignment will be re-graded. Please note that upon re-grade your mark may go down, stay the same, or go up. You have 30 days after receiving a mark to appeal it.

ACCESSIBILITY NEEDS

If you have a disability/health consideration that may require specific accommodations, please approach the instructor (not your TA) and accessibility services. I will gladly work with the service on any needed accommodation. Students who seek accommodations require medical documentation and an intake interview with a disability advisor to discuss their individual needs. To schedule a registration appointment with a disability advisor, please call the Centre at 416-978-8060. See also http://www.accessibility.utoronto.ca.

COURSE SCHEDULE

WEEK 1

Class—11 January

Lab/tutorial—14 January or 15 January

> Topic: Introduction, level of measurement, basic descriptive statistics pt. 1
> Healey and Prus reading: Chapter 1 and Chapter 2 up to section 2.5 (pg. 49)
> HW due 11:59p 14 January

WEEK 2

Class 2—18 January

Lab/tutorial—21 January or 22 January

> Topic: Basis descriptive statistics, pt. 2; central tendency and dispersion
> Healey and Prus reading: Chapter 2 (section 2.5 and onward) and Chapter 3
> HW due 11:59p 21 January

WEEK 3

Class 3—25 January

Lab/tutorial—28 January or 29 January (TEST REVIEW)

LAB 1 ASSIGNMENT DUE DURING TUTORIAL

> Topic: The normal curve
> Healey and Prus reading: Chapter 4
> HW due 11:59p 28 January

WEEK 4

MIDTERM TEST 1—1 February

NO HW

NO LAB/TUTORIAL

WEEK 5

Class 5—8 February

Lab/tutorial—11 February or 12 February

> Topic: Sampling, sample distributions, and confidence intervals
> Healey and Prus reading: Chapters 5-6
> HW due 11:59p 11 February

FAMILY DAY—NO CLASS 15 FEBRUARY

WEEK 6

Class 6—22 February

Lab/tutorial—25 February or 26 February

>Topic: Introduction to hypothesis testing
>Healey and Prus reading: Chapter 7
>HW due 11:59p 25 February

WEEK 7

Class 7—29 February

Lab/tutorial—3 March or 4 March

>Topic: Two sample hypothesis tests for means and proportions
>Healey and Prus reading: Chapter 8
>HW due 11:59p 3 March

WEEK 8

Class 8—7 March

Lab/tutorial—10 March or 11 March (TEST REVIEW)

LAB 2 ASSIGNMENT DUE DURING TUTORIAL

>Topic: Hypothesis testing with ANOVA
>Healey and Prus reading: Chapter 9
>HW due 11:59p 10 March

WEEK 9

MIDTERM TEST 2—14 MARCH

>*Note: test will cover material from weeks 5-8*

>NO HW

>NO LAB/TUTORIAL

WEEK 10

Class 10—21 March

Lab/tutorial—24 March [note: no tutorial on 25 March due to Good Friday; <mark>makeup session will be XX</mark>]

Topic: Measures of association and hypothesis-testing at the nominal level: Chi-square, Phi, Cramer's V, and Lambda
Healey and Prus reading: Chapters 10-11
HW due 11:59p 24 March

WEEK 11

Class 11—28 March

Lab/tutorial—31 March or 1 April

Topic: Hypotheses and measures of association at the interval/ratio level: scatterplots, correlation, regression
Healey and Prus reading: Chapter 13
HW due 11:59p 26 March

WEEK 12

Class 12—4 April

Lab/tutorial—7 April or 8 April (FINAL EXAM REVIEW)

LAB 3 ASSIGNMENT DUE DURING TUTORIAL

Topic: Testing hypotheses with multiple regression
Healey and Prus reading: Chapter 14
HW due 11:59p 7 April

FINAL EXAM—date, time, and location TBA

Note: exam will cover material from the entire course