

## Introduction to Quantitative Methods

### SOC202H1F – Summer 2019

Class Sessions: 12-2PM on Monday and Wednesday in FE 36

Tutorial Sessions: 2-3:30PM on Monday and Wednesday in FE 36

Instructor:

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Teaching Assistant:

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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 depend 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: **practice, practice, practice**. 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 a combination of SOC102H+ SOC103H, SOC102H+ SOC150H1, SOC103H+ SOC150H1, or SOC100H1+ SOC150H1**. Students without this prerequisite will be removed at any time and without notice.

## LEARNING COMPONENTS

### (1) Class lectures

The first two hours of each class session 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 of learning throughout the semester.

### (2) Textbook

This course will use the following text:

Healey, Joseph F., Steven G. Prus, and Riva Lieflander. 2019. *Statistics: A Tool for Social Research*, 4<sup>th</sup> Canadian Ed. Nelson Education Ltd.

With the purchase of the text package (\$131.95) at the UofT Bookstore you will receive the print text and an access code for MindTap, the online system this class uses for homework assignments. You may also choose to purchase MindTap with an ebook (\$59.95) at the UofT Bookstore.

### **(3) Lab/Tutorial Sessions and Use of SPSS**

Lab/tutorial sessions for this class will be held in FE 36, directly following class lecture. The goal of these 1.5-hour 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 13 May, 29 May, and 12 June). Each lab assignment consists of work conducted in lab during the preceding sessions. **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 lab work during the lab/tutorial sessions, but you may find yourself needing extra time to complete the assignments. The computer lab in FE-36 (basement of Sociology dept. at 725 Spadina) is available to SOC202 students during additional times during the course of the summer term. Here are the extra times when the lab will be open:

- Tuesdays, 9a-12p
- Wednesdays, 3:30p-5p

SPSS is also available on computers in the Robarts Map and Data Library (5<sup>th</sup> floor of Robarts Library). This computer lab is open most hours during regular Robarts Library hours (8:30a-10:45p). You can use this website to identify whether there are free computers in the Map and Data Library (<https://cafstatus.icicle.utoronto.ca/frontend/Web/Summary/MD>).

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 13 May, 29 May, 12 June) will be used exclusively as a review session; there will be no SPSS lab work during those sessions. Rather, students are encouraged to ask questions about concepts that will be featured on the tests.

There will be no lab/tutorial on days in which a test is given. That is, **there will be no lab on 15 May or 5 June.**

### **(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 Monday and can be completed until 11:59p each Friday. That is, you will have a 111 hour window in which each assignment can be completed.

To complete the homework, you must first create an online account through the course website at <https://login.nelsonbrain.com/cb/entitlement.htm?code=MTPPZ9LN3ZCG>. 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 short assignments that correspond with the textbook reading. After answering

most questions, you will receive immediate feedback on your performance—i.e., you will know which questions were correct and which ones were incorrect. Most questions allow a total of three takes. Your mark for the assignment will be based on the highest of the three attempts.

Because there is such large window of time during which assignments can be taken (9a Monday – 11:59p Friday = 111 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 (2.5%), so missing one home work 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 15 May, will consist of material from sessions 1-3. The second test will be given on 5 June and will consist of content covered in sessions 5-7.

Each test will consist of 30 multiple choice questions and five open-ended questions. You will have up to 2 hours and 50 minutes to complete each test. Simple, non-programmable 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. The final exam is cumulative—it will cover material from sessions 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	6	2.5% 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 Mondays and 11:59p on Fridays, 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.

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](http://www.illnessverification.utoronto.ca). It must be completed by a physician, surgeon, nurse practitioner, dentist or clinical psychologist. A doctor’s note is acceptable but MUST indicate the start and anticipated end date of the illness. 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
<b>Homework assignments</b>	
Homework assignment a	Due 11:59p 10 <sup>th</sup> of May
Homework assignment b	Due 11:59p 17 <sup>th</sup> of May
Homework assignment c	Due 11:59p 24 <sup>th</sup> of May
Homework assignment d	Due 11:59p 31 <sup>st</sup> of May
Homework assignment e	Due 11:59p 7 <sup>th</sup> of June
Homework assignment f	Due 11:59p 14 <sup>th</sup> of June
<b>Lab Assignments</b>	
Lab assignment 1	Due in tutorial on the 13 <sup>th</sup> of May
Lab assignment 2	Due in tutorial on the 3 <sup>rd</sup> of June
Lab assignment 3	Due in tutorial on the 14 <sup>th</sup> of June
<b>In-Class Tests</b>	
Test 1	15 <sup>th</sup> of May
Test 2	5 <sup>th</sup> of June
<b>Final Exam</b>	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 QUERCUS**

The University of Toronto Quercus 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 Quercus,** not sent by e-mail to the instructor or TA. The reason we encourage you to post your questions to Quercus 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 to midterm test 1, another discussion board for the classes preceding midterm test 2, and a third discussion board for final exam concerns. Lance Stewart, our course TA, will be actively monitoring the discussion board and will respond to questions addressed to him/her 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 Lance Stewart 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

### ***SESSION 1***

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*May 6*

Topic: Introduction, level of measurement, basic descriptive statistics pt. 1  
Healey et al. reading: Chapter 1 and Chapter 2 up to (not including) section 2.6 (pg. 52)

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### ***SESSION 2***

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*May 8*

Topic: Basic descriptive statistics, pt. 2; central tendency and dispersion  
Healey et al. reading: Chapter 2 (section 2.5 and onward) and Chapter 3

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**HW a due 11:59p 10 May**

### ***SESSION 3***

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*May 13*

Topic: The normal curve, z-scores, and probability  
Healey et al. reading: Chapter 4

*LAB 1 ASSIGNMENT DUE DURING TUTORIAL*

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**HW b due 11:59p 17 May**

### ***SESSION 4***

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*May 15*

### ***MIDTERM TEST 1***

*Note: test will cover material from sessions 1-3*

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***NO CLASS MAY 20, VICTORIA DAY***

***SESSION 5***

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*May 22*

Topic: From description to inference: sampling, sample distributions, and confidence intervals  
Healey et al. reading: Chapters 5-6

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**HW c due 11:59p 24 May**

***SESSION 6***

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*27 May*

Topic: Introduction to hypothesis testing  
Healey et al. reading: Chapter 7 up to (not including) section 7.5, section 7.10, and Chapter 10

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***SESSION 7***

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*29 May*

Topic: Two sample hypothesis tests for means and proportions  
Healey et al. reading: Chapter 11  
HW due 11:59p 2 March

*LAB 2 ASSIGNMENT DUE DURING TUTORIAL*

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**HW d due 11:59p 31 May**

***SESSION 8***

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*3 June*

Topic: Hypothesis testing with ANOVA  
Healey et al. reading: Chapter 12

*LAB 2 ASSIGNMENT DUE DURING TUTORIAL*

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## ***SESSION 9***

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*5 June*

### ***MIDTERM TEST 2***

*Note: test will cover material from sessions 5-8*

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**HW e due 11:59p 7 June**

## ***SESSION 10***

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*10 June*

Topic: Measures of association and hypothesis-testing at the nominal level: Chi-square, Phi, Cramer's V, and Lambda

Healey et al. reading: Chapter 7 (section 7.5 and onward, but not 7.10) and Chapter 8

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## ***SESSION 11***

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*12 June*

Topic: Hypotheses and measures of association at the interval/ratio level: scatterplots, correlation, regression

Healey et al. reading: Chapter 13

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**HW f due 11:59p 14 June**

## ***SESSION 12***

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*17 June*

Topic: Testing hypotheses with multiple regression

Healy et al. reading: Chapter 14

***LAB 3 ASSIGNMENT DUE DURING TUTORIAL***

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**FINAL EXAM**—date, time, and location TBA

*Note: exam will cover material from the entire course; half the content will come from sessions 10-12 and half comes from sessions 1-8*