Introduction to Quantitative Methods in Sociology

Instructor: Fedor A. Dokshin, PhD

E-mail: fedor.dokshin@utoronto.ca

Office: Room 17123 in Sociology Dept.
700 University Ave (17th floor)

Office Hours: Wednesdays, 3:00-5:00pm

Teaching Assistants:
Sagi Ramaj, MA
Email: sagi.ramaj@mail.utoronto.ca

Leo Henry, MA
Email: leo.henry@mail.utoronto.ca

Class: Mon/Wed, 9am to 11am
Location: Online synchronous (Zoom)

Tutorials: Online (asynchronous)

Class website: https://q.utoronto.ca

Course Description and Aims

This course is designed to introduce statistical methods to students majoring in sociology. The class focuses on fundamental statistical concepts and on the *application* of basic statistical techniques. You are expected to be familiar with and apply algebraic operations, but the course will avoid advanced mathematical concepts and proofs. We will start by introducing the building blocks of statistics: variables, levels of measurement, and probability distributions. We will then learn how to use quantitative data from samples to estimate characteristics of populations, test whether the estimates differ across subpopulations, and make inferences about relationships between two or more observed variables.

After taking this course you should be able to:

1. *Describe* how researchers use samples to make inferences about populations.
2. *Identify* important assumptions that underlie basic statistical analyses reported in the scholarly literature and in the news.
3. *Use* basic statistical techniques to (a) describe key characteristics of populations, (b) infer population means and proportions from sample data, (c) compare means and proportions of two or more groups, (d) conduct a test of independence on a contingency table, (e) describe the association between two variables, and (d) estimate the linear relationship between two or more variables.
4. *Gain familiarity* with the SPSS statistical software package by practicing the techniques we cover in class.
5. *Begin to develop an intuition* about how the concepts and techniques you learn in this class would generalize to accommodate more sophisticated analyses.

Prerequisite

The prerequisite to take this course is SOC101Y1 or SOC102H1+SOC103H1 or SOC102H1+SOC150H1 or SOC103H1+SOC150H1 or SOC100H1+SOC150H. Students without this prerequisite will be removed at any time and without notice.

Learning Components and Course Requirements

Lectures:

Lectures will take up the first 2 hours of each session. Lectures will cover the main topics from the assigned readings and highlight important concepts and techniques. We will place special emphasis on working through example problems in class. Attendance will not be recorded and is not part of your final grade, but responsibility of being aware of what the professor says in lectures (including administrative announcements) rests with the student. See "Keys to Success" below for additional reasons why you should attend lectures.

Tutorials:

Lab/tutorial sessions for this class will be **asynchronous**. Tutorial videos will be made available on the day of each lecture (Midterm days excluded). You are responsible for watching the video before the next lecture. The main purpose of tutorials is to introduce you to SPSS, a statistical software package widely used in academic research and in industry. In the videos, your teaching assistants will guide you through exercises to practice applying the statistical techniques we cover to actual data. The exercises are from your textbook, so **you will need to have access to your textbook during lab**. You are expected to follow along, practicing using SPSS to conduct analyses. You will need to apply these same techniques in your lab assignments.

There will be **three lab assignments** during the course of the semester. You will work on these independently, but the Teaching Assistants for the course will hold remote office hours to allow you to ask questions. You will submit your assignments electronically, through Quercus, on the assigned due dates (see below). **A penalty of 5% points per day will be assessed for late work.**

Required Text (*note the edition*):

Healey, Joseph F., Christopher Donoghue, and Steven G. Prus. 2023. Statistics: A Tool for Social Research and Data Analysis, **5th Canadian Ed**. Cengage.

The textbook is available in the U of T bookstore. **IMPORTANT**: Whether you purchase a hard copy or online-only, you will receive a password for MindTap, which will give you access to the electronic version of the book, the online system this class uses for homework assignments, and other electronic resources. Follow the instructions posted on our Quercus site to enroll in the correct MindTap course.

Required Software:

SPSS is the statistical software package you will need to use to complete lab assignments. You can purchase an SPSS license through the UofT's Licensed Software office (https://onesearch.library.utoronto.ca/ic/licensed-software). UofT has negotiated a special student price for an SPSS license, if you purchase through the link above. An SPSS license on your own computer is the easiest and most reliable way to access SPSS. You have **two alternatives**, however, if you choose not to purchase a license. First, you can access SPSS through the computer lab in the Map & Data Library on the 5th floor of Robarts (https://onesearch.library.utoronto.ca/library-info/DATAMAPGIS). Second, SPSS will be available through remote desktop on the Sociology Department lab computers. (Details on this latter option will be published on Quercus).

IMPORTANT: Historically, many students choose not to purchase SPSS and have used the Remote Access option to successfully complete coursework. This is perfectly fine. You should note, however, that remote resources may be busy and technical issues can arise. Ultimately, **you are responsible for completing your assignments on time**.

Calculator:

You will need a calculator to complete homework assignments and for use during exams. A scientific calculator capable of doing basic algebraic functions is sufficient (you do not need a graphing calculator). **IMPORTANT**: you will NOT be allowed to use a graphing calculator, or a calculator on your cellphone or computer during exams.

Discussion board participation:

We will keep an active class discussion board on Quercus. You are **required to contribute to the discussion board at least twice before the week preceding the midterm test and twice after the midterm.** Your contribution may take one of multiple forms. You may post a question about course material or about something outside the class that relates to course material. Alternatively, you can elaborate or answer someone else's question. Explaining something does not only help the person

who asks the question, but research shows that the exercise of explaining also helps the explainer understand the content more deeply and retain it better.

Weekly homework assignments:

To reinforce course material, students will be required to complete homework assignments following each lecture. These assignments will thus be due Tuesdays at 11:45 pm (following Monday lectures) and Fridays at 11:45pm (following Wednesday lectures). No homework will be assigned during the week of the mid-term test. **To complete the homework, you must first create an online account through the MindTap website** See Quercus or click this link for registration instructions.

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 that corresponds with the textbook readings for the week. 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. Each individual homework assignment is worth only a small fraction of your final mark (1.5%), so missing one or two homework assignments will not have a drastic impact on the overall mark calculation.

Mid-term tests and final exam:

A mid-term test will be given and administered in class on May 26th, 2025. You will have 1 hour 50 minutes to complete the test.

A final assessment will be given during the End of Term Assessment period in June. This assessment is cumulative—it will cover material from 7-12, but also from the material covered earlier in the semester. The assessment will have a similar format to the mid-term test, consisting of multiple choice and open-ended questions. You will have 1 hour 50 minutes to complete the assessment.

Evaluation Components

	Number of occasions	Percent value	Total percent of final mark
Syllabus quiz & discussion participation	Throughout the semester	5%	5%
Homework assignments	10	1.5% each	15%
Lab assignments	3	10% each	30%
Mid-term tests	1	25%	25%
Final Exam	1	25%	25%
			100% (total)

Keys to Success

Reading and lectures:

It is the rule and not the exception to find new material confusing on first reading. The philosopher René Descartes wrote that one needs to read a book three times to understand it. The point is that every additional exposure to the material deepens your understanding of the content. After a first reading of a chapter you will have a broad sense of its contents. Having this exposure will enable you to get much more out of the lecture. The lecture will reinforce the content that you read and you will be able to anticipate the parts of the lecture that require a little extra attention and ask relevant questions. To be successful in this class, you should come to lecture having read the assigned chapters. Even a skim of the relevant pages is better than no exposure, if you are running short on time.

Practice, Practice, Practice:

Contrary to some popular beliefs, mathematical competence is not intrinsic, but, like any skill, it improves with practice. Do not be intimidated if the ideas in the textbook do not come naturally—they don't! In statistics, as in any other class, practice makes perfect. Doing example problems distills the abstract concepts, so that you can more clearly see how they fit together. This is why the course will have weekly homework assignments designed to reinforce the content from the book and lectures. It is in your long-term interest to do these diligently and ask questions as they arise. The TAs are available for help during tutorials and I welcome your questions during my office hours.

Communication and Quercus

Email:

Please use your U of T email address to communicate with me about **personal matters**, or to communicate with the TAs. You can expect us to respond to your emails within 24 hours, M-F 9am-5pm. Here's a couple of important points about email communication:

- Please note that the instructor and TA will not respond to emails about issues that are clearly specified in the syllabus (e.g., due dates, office hours times).
- Address your questions about tutorials to your TA.
- Requests for make-up tests and other accommodations should be sent to the course instructor (Professor Dokshin), 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.

Quercus website:

The University of Toronto Quercus system will contain the course syllabus, assignments, discussion board, and course announcements.

Discussion board:

You are expected to actively participate in the online discussion (see above). Questions about course content should be posted on the relevant Quercus discussion board.

Office hours:

Office hours with Professor Dokshin are by appointment. The TAs office hours will be announced on Quercus.

Late Work and Make-up Tests

Lab assignments:

Lab assignments must be submitted online, through the Quercus website. See the course schedule (below) for the due dates of the three lab assignments. Late submission will result in a 5% deduction for each day the assignment is late (starting with the day the assignment is due, up to a maximum of 50% of the grade) unless you have a legitimate, documented reason beyond your control. Notify the Professor and your TA promptly, if you intend to submit your assignment late to arrange for the submission of the lab assignment with the necessary documentation. It is the student's responsibility to ensure that submitted document files are not corrupted. **If the submitted file cannot be opened, the assignment will be treated as incomplete.**

Homework:

Homework assignments can be completed from anywhere with an internet connection. There are no make-ups offered for these assignments.

Make-up mid-term Test:

Students who miss the mid-term will receive a mark of zero unless reasons beyond their control prevent them from taking it. Students wishing to make-up the test must email the Professor promptly and provide appropriate documentation (see details below).

Documentation:

Students who miss an assignment deadline or a test will receive a mark of zero for that assignment or test unless the reason is a circumstance beyond their control. **Within three days** of missing a paper deadline or test, students must send the instructor a request for consideration. Students must document their request with **one of the following:**

- Absence declaration via ACORN (**can only be used once during the semester**)
- U of T Verification of Illness or Injury Form
- College Registrar's letter (e.g., in case of personal/family crisis or emergency)
- Letter of Academic Accommodation from Accessibility Services

Students who miss the test or are late in submitting an assignment for other reasons, such as family or other personal reasons, should request their College Registrar to email the instructor.

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 one of the TAs about 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 Professor Dokshin 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.**

Academic Integrity

Academic integrity is fundamental to learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T degree that you earn will be valued as a true indication of your individual academic achievement, and will continue to receive the respect and recognition it deserves.

Familiarize yourself with the University of Toronto's Code of Behaviour on Academic Matters (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm). It is the rule book for academic behaviour at the U of T, and you are expected to know the rules. Potential offences include, but are not limited to:

- Obtaining or providing unauthorized assistance on any assignment including:
  - working in groups on assignments that are supposed to be individual work;
  - having someone rewrite or add material to your work while "editing";
  - crowdsourcing assignment answers through an online platform, like Facebook or Discord;
  - using generative AI tools to complete assignments (see more on AI policy below).
- Lending your work to a classmate who submits it as his/her own without your permission.
- Using or possessing any unauthorized aid, including a cell phone.
- Looking at someone else's answers.
- Letting someone else look at your answers.
- Misrepresenting your identity.
- Submitting an altered test for re-grading.
- Falsifying or altering any documentation required by the University, including doctor's notes.
- Falsifying institutional documents or grades.

Policy on Generative AI

Large Language Models (LLM), Generative Artificial Intelligence (AI), and related machine learning systems have been proliferating. Some of these systems automatically answer questions, generate essays, computer code, or images using minimal human prompting. This includes various versions of ChatGPT as well as many other writing and research assistants. Students are ultimately accountable for the work they submit.

In this class, students *may* use AI tools for studying, asking questions about course themes, assimilating information for general understanding, refining language or grammar (i.e., ESL purposes), or identifying secondary literature.

In this class, students ***may not* use artificial intelligence** tools to automatically generate any part of your submitted assignments.

Accessibility Needs

If you require accommodations or have any accessibility concerns, please visit http://studentlife.utoronto.ca/accessibility as soon as possible.

Course Schedule

Session	Class	Topic & Reading	Assignments Due
1	5-May	Introduction, level of measurement Reading: Basic Mathematics Review; Chapter 1	Syllabus/start of semester quiz due on Fri, 12-May, 11:59pm HW 1 due on Tue, 6-May, 11:45pm
2	7-May	Descriptive statistics, measures of central tendency and dispersion Reading: Chapter 2 & Chapter 3	HW 2 due on Fri, 9-May, 11:45pm
3	12-May	More dispersion, the normal curve, z-scores, estimating probabilities Reading: Chapter 4 (Re-read Ch. 3 p. 96-102 about standard deviation)	HW 3 due on Tue, 13-May, 11:45pm
4	14-May	Sampling, sampling distributions, and introduction to estimation Reading: Chapters 5	HW 4 due on Fri, 16-May, 11:45pm Lab Assignment 1 due on Fri, 16-May, 11:45pm
MAY 19th—NO CLASS (VICTORIA DAY)			
5	21-May	Estimating means and proportions from sample data Reading: Chapter 6	HW 5 due on Fri, 23-May, 11:45pm
6	26-May	Midterm test	No homework
7	28-May	Introduction to hypothesis testing Reading: Chapter 7 up to (not including) section 7.5, section 7.10 and Chapter 10	HW 6 due on Fri, 30-May, 11:45pm
8	2-June	Two sample hypothesis tests Reading: Chapter 11 up to (not including) section 11.4	HW 7 due on Tue, 3-June, 11:45pm Lab Assignment 2 Due on Fri, 6-June, 11:45pm
9	4-June	Analysis of Variance (ANOVA) Reading: Chapter 12	HW 8 due on Fri, 6-June, 11:45pm
10	9-June	Independence/association, measures and hypothesis tests for nominal and ordinal data Reading: Chapter 7 (section 7.5 and onward, but not 7.10) and Chapter 8	HW 9 due on Tue, 10-June, 11:45pm
11	11-June	Hypothesis testing and measures of association for interval-ratio variables Reading: Chapter 13	HW 10 due on Fri, 13-June, 11:45pm
12	16-June	Introduction to multiple regression Reading: Chapter 14	HW 11 due on Tue, 17-June, 11:45pm Lab 3 Assignment Due on Fri, 20-June, 11:45pm
FINAL EXAM: June 21; 2pm (Note: exam will be administered online)			