



Sociology 9001: Introduction to Multivariable Statistical Analysis

Fall Term 2026

Course Description

Overview. This course provides an introduction to the statistical concepts and tools used in social science research. Throughout the course, we will talk about how quantitative data is collected and analyzed. We will cover descriptive statistics, sampling distributions, statistical inference for means and proportions (including point estimates, confidence intervals, and hypothesis tests), the comparison of two or more groups, correlation, and linear regression. We will apply the concepts we learn to real-world research problems, and use them to conduct and interpret data analysis in Stata, a commonly-used statistical software package. During labs, we will talk through saving our data, code, and output; making tables and figures; and dealing with some common issues that arise in the analysis of data.

This course is intended to prepare students to take Advanced Multivariable Statistical Analysis (Sociology 9007) in the winter term. Throughout this course, we will encounter some math and mathematical concepts, but no particular math skills beyond algebra are required. I will introduce notation, concepts, and methodology gently and with an eye towards practical application. The course, however, is *not* focused on mathematical statistics.

Enrollment Restrictions. Enrollment in this course is restricted to graduate students in the sociology graduate program, as well as any student that has obtained special permission to enroll in this course from the course instructor as well as the Graduate Chair (or equivalent) from the student's home program.

Learning Outcomes

1. Learn how data are collected and used in quantitative social science
2. Understand common statistical tools, when and how to appropriately use them, their underlying assumptions, and how to interpret their results
3. Read and thoughtfully evaluate published sociological research using the quantitative methods we cover
4. Gain basic familiarity with the statistical software package Stata in order to manage social science survey data, describe patterns, and interpret relationships between variables

Course Materials

Readings. We will rely primarily on the following textbook:

Agresti, Alan (2018). *Statistical Methods for the Social Sciences*, Fifth Edition. Pearson.

The textbook is [available](#) in print (about \$370) or as an e-book (about \$72 for 6-month access). You are welcome to use an earlier edition (e.g., the 4th edition), and to obtain the book in whatever way is most convenient and economical for you. I will also make this book available on course reserve at Weldon Library.

In addition, I recommend the following *optional* texts if you are looking for other explanations, examples, or problems:

General:

- Arnold, Robert (2014). *Intermediate Social Statistics*. Oxford.
- Noack, Andrea M. (2018). *Social Statistics in Action: A Canadian Introduction*. Oxford.
- Treiman, Donald J. (2009). *Quantitative Data Analysis: Doing Social Research to Test Ideas*. Jossey-Bass.
- Gordon, Rachel A. (2010). *Regression Analysis for the Social Sciences*. Routledge Press.

Using Stata:

- Kohler, Ulrich, and Frauke Kreuter (2012). *Data Analysis Using Stata*, Third Edition. Stata Press.
- Longest, Kyle C. (2019). *Using Stata for Quantitative Data Analysis*, Third Edition. Sage.
- Long, J. Scott (2009). *The Workflow of Data Analysis Using Stata*. Stata Press.
- Rabe-Hesketh, Sophia, and Brian Everitt (2007). *Handbook of Statistical Analysis Using Stata*, Fourth Edition. Chapman and Hall.

Writing about Statistics:

- Miller, Jane E. (2005). *The Chicago Guide to Writing about Multivariate Statistics*. University of Chicago Press.

Stata. Throughout the course, we will practice using the statistical package Stata. For class sessions that are marked with **Lab**, we will hold a portion of our class meeting in SSC 1000. We will usually start class in our usual classroom—so report there first, unless I send you a message beforehand.

I strongly recommend that students purchase a [Stata license](#), which is available to students for as low as \$48 USD for a 6-month license for the basic (BE) version. Stata/BE should be able to handle the kinds of datasets we will encounter in class, although students who anticipate using Stata for their own research may want to consider the standard (SE) version, which can handle larger datasets (\$95 USD for a 6-month license, \$179 for the year, and \$485 for a perpetual license). Stata is also available to students free-of-charge and remotely through [MyVLab](#).

To use Stata in the lab, students should have a computer account with SSNDS and should make sure they are able to login before our first computer lab session. In order to access Stata

in the lab, students must: (1) have active Western accounts, and (2) have subscribed to “Western Identity Manager” and synchronized their passwords through the “Profile” tab. If you are having trouble gaining access, please call either the SSNDS main office (519-661-2152) or the ITS Help Desk (519-661-3800).

I’m not expecting you to have any prior experience with or knowledge of this particular program, but it would be helpful to have had some exposure to other statistical tools (e.g., SPSS, R, or even Excel). Students—particularly those with limited computer literacy—may find it useful to explore the opportunities provided by the Social Science Computing Lab as they get up to speed with Stata. Another great resource is [UCLA’s Stata website](#).

Course Evaluation

Problem Sets (60%). In statistics, as in life, practice makes habit. As such, there will be five (5) problem sets to provide you with the opportunity to practice what we learn—including what we do in Stata—in a relatively low-stakes environment. Completed problem sets must be submitted by the start of class on the date stated in the course schedule below. Students may work together, but each must turn in their own assignment. Each problem set is equally weighted (12% of your final grade).

Replication Project (40%). Throughout the course, we will replicate published research. In other words, we will try and see if we can use the same data sources and the information contained in journal articles to produce similar results as the original authors. We’ll talk more about why this is a useful exercise; briefly, the goal is to take some of the mystery out of how researchers process, analyze, and interpret the data to come to their conclusions. For your final project in the course, you will be asked to take on a replication on your own. I will provide a dataset and a series of research questions and results using those data. You will get to choose one of those questions that most interests you, and see how close you can come to replicating my work. We’ll talk about this project in much greater depth in the first several weeks of class.

A Note About Attendance: Because you cannot actively engage with the materials and your colleagues if you are not here, in order to receive a passing grade students are expected to attend at least 80% of the class meetings for this course. This requirement will only be waived in exceptional circumstances with documentation. While attendance is not an explicit part of the evaluation breakdown, you will see your final grade lowered if you miss an excessive number of class sessions. Please inform me as soon as possible if you are unable to attend a class for medical or personal reasons.

How to Contact Me

I can be reached via email at pdenice@uwo.ca. Students are also encouraged to come to office hours, to set up an appointment, or to approach me before or after class.

How to Get Important Information

You will find course content and announcements posted to our Brightspace website. I will also announce any upcoming deadlines or changes to the course schedule in class. If you miss a class, check with a classmate for any notes or other materials.

Important Policies

Scholastic Offences. Scholastic offences are taken seriously and students are directed to read the [Scholastic Offences policy](#), specifically, the definition of what constitutes a Scholastic Offence.

Plagiarism. Students must write their assignments in their own words. Whenever students take an idea from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major scholastic offence. All required assignments may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and [Turnitin.com](#).

Health/Wellness Services. Students who are in emotional/mental distress should refer to [Mental Health Support at Western](#) for a complete list of options how to obtain help.

Accessible Education Western (AEW). Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program.

Graduate students with disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are encouraged to register with Accessible Education Western (AEW), a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both AEW and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged. These accommodations include individual counseling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.

Statement on Gender-Based and Sexual Violence. Western is committed to reducing incidents of gender-based and sexual violence (GBSV) and providing compassionate support to anyone who is going through or has gone through these traumatic events. If you are experiencing or have experienced GBSV (either recently or in the past), you will find information about support services for survivors, including emergency contacts at this [website](#). To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Statement on the Use of Generative Artificial Intelligence (AI). Students may *not* use generative artificial intelligence (AI) tools, software, or apps for most aspects of this course, including (but not limited to) writing the answers to their homework assignments, drafting their final projects, brainstorming research ideas, or reviewing literature. However, students *may* use AI to debug errors or troubleshoot issues in their Stata code. But I urge caution: While AI can help troubleshoot tricky coding issues, it can make mistakes and incorrect or nonsensical suggestions. Therefore, it is crucial that students understand what they are trying to do when asking AI for help with Stata and that they critically evaluate the proposed solutions. If you do use AI in your work, you *must include a statement at the end of your assignment or paper* detailing how you used these tools. If you have any questions or doubts about whether and how to use AI in this class (or in your graduate work more generally), please contact the instructor.

Standards of Professional Behaviour. It is the responsibility of all members of the Department of Sociology to adhere to and promote standards of professional behaviour that support an effective learning environment. These include:

- Respect for others both in and out of the classroom through words and actions (be professional, fair, and respectful in interactions with people on-line and in-person; understand and respect differences among classmates and colleagues; avoid disrupting the learning environment; respect others' expectations of confidentiality and privacy).
- Active engagement in learning and commitment to quality (being prepared for classes; participating and listening actively to other; using technology and social media appropriately, striving to do your best). Take responsibility for your own learning by: relating course content and projects to your own professional interests; monitoring your own understanding; seeking clarification and assistance when necessary.
- Personal integrity (following through on commitments; doing one's own work).

Students should also be aware of the [Western Student Code of Conduct](#).

Assignment Deadlines. Students must submit their assignments by the date and time stated in the course outline and on the Brightspace website. Late assignments will be penalized 10% for each day they are late. Any assignment not received within 5 days of the due date will not be accepted, except in the event of a documented medical or family emergency. If a student anticipates an issue with an assignment, they are recommended to speak to the professor as early as possible to make alternative arrangements.

Completion of Course Requirements. Course requirements must be completed by the end of the term in which the course is offered (Fall–December 31; Winter–April 30, Summer–August 31). Only in exceptional circumstances may a student take additional time to complete the course requirements. In such a case, the student must first meet with the Graduate Chair to request permission to carry the incomplete. Medical documentation, where required, will be kept on file in the Sociology graduate program office. More details regarding incompletes are outlined in the [Sociology Graduate Handbook](#).

Laptops, Phones, and Other Electronic Devices in Class. I *strongly* encourage students to take notes without a computer if you are able. If you need a laptop to take notes during class, please refrain from browsing the internet, texting, or going on social networking sites such as Facebook or Twitter. Students who disrupt their colleagues' learning through the use of their laptop or tablet will be told to put away their device, and they will not be permitted to use it for the remainder of the class. Be sure that all cell phones are silenced and put away at the beginning of class.

Recording Devices. Recording devices may not be used in this class. If you require a recording device for medical, accessibility, or other reasons, please see me.

Lectures and Other Course Materials. Any materials created by the instructor (e.g., notes, handouts, summaries, slide decks, assignments, exams, etc.) are protected by copyright law and may not be copied or distributed in any form without the explicit permission of the instructor. Any non-authorized use of these materials constitutes an academic offence.

Disputing a Grade. Students who wish to dispute an assignment, exam, or course grade must write a one-page explanation justifying why their work should be re-evaluated. Work will not be

re-evaluated on the basis that students were sick or feeling stressed when completing the assignment. Please be advised that a student's mark may go up or down upon re-evaluation.

Extraordinary Circumstances. The content and/or evaluation of this course is subject to change in the event of extraordinary circumstances beyond the University's or instructor's control.

Course Schedule

Please note: Readings and assignments must be completed prior to class on the date listed. This schedule is subject to change over the course of the term in order to meet the needs of the class. Any changes will be announced in class and/or through our Brightspace course website.

Week 1 (Sept. 16): Introduction: Data, Sampling, and Measurement

- 📖 Read Agresti Ch. 1 & 2
- 📊 Stata Lab 1: The basics
- ✍️ Review the *Math Bootcamp* tutorial (optional, but strongly recommended)

Week 2 (Sept. 23): Descriptive Statistics

- 📖 Read Agresti Ch. 3
- 📊 Stata Lab 2: Describing data

Week 3 (Sept. 30): Probability Distributions

- 📖 Read Agresti Ch. 4
- ★ **Note:** *Because this class falls on Truth and Reconciliation Day, we will reschedule.*

Week 4 (Oct. 7): Statistical Inference: Estimation

- 📖 Read Agresti Ch. 5
- 📊 Stata Lab 3: Graphs
- ✍️ Problem Set 1

Oct. 14: *Reading Week – no class*

→ *Enjoy the break!*

Week 5 (Oct. 21): Statistical Inference: Significance Tests

- 📖 Read Agresti Ch. 6
- ✍️ Problem Set 2

Week 6 (Oct. 28): Comparing Two Groups

- 📖 Read Agresti Ch. 7
- 📊 Stata Lab 4: Testing between groups

Week 7 (Nov. 4): Association between Categorical Variables

 Read Agresti Ch. 8

 Stata Lab 5: Chi-square tests

 Problem Set 3

Week 8 (Nov. 11): Linear Regression and Correlation

 Read Agresti Ch. 9

Week 9 (Nov. 18): Introduction to Multivariable Relationships

 Read Agresti Ch. 10

 Stata Lab 6: Correlation and regression

 Problem Set 4

Nov. 25: *Prof. Denice is out of town – no class*

→ *Enjoy the break!*

Week 10 (Dec. 2): Multiple Regression

 Read Agresti Ch. 11

Week 11 (Dec. 9): Model Building with Multiple Regression

 Read Agresti Ch. 12

 Stata Lab 7: Multiple regression

 Problem Set 5

Replication project due: Wednesday, December 16, at 12:00pm