



The University of Western Ontario
The University of Western Ontario
SOCIOLOGY 9001
Introduction to Multivariable Analysis
Fall 2024
Tuesday 1:30pm-4:30pm / SSC 1316A
In-person

Professor: Yoko Yoshida

Office Hours: Wednesdays (10am -11am) – or by appointment

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Enrollment Restrictions:

Enrollment in this course is restricted to graduate students in Sociology 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.

Course Description:

The course will provide an introduction to the statistical concepts and techniques used in social science research. Starting with brief discussion about how quantitative data are collected, processed, and analyzed in social research settings, the course will introduce foundational statistical operations, including descriptive statistics, sampling distributions, statistical inference, correlation, and linear regression, and examine how these operations are applied in answering empirical research questions. The lab sessions will also provide basic skillsets for data management, data processing, as well as statistical operations for data analysis, using STATA – a commonly used statistical software.

By developing an independent course project students will learn how to apply statistical tools to produce relevant statistics and how to interpret those results in order to answer to empirical research questions. In addition, a set of lab assignments and a statistical assignment will be placed in order to solidify the foundational knowledge and operational skillsets for producing accurate statistical results. This course is intended to prepare students to take Advanced Multivariable Statistical Analysis (Sociology 9007) in the winter term.

Learning Outcomes:

At the end of the course, students will learn a foundational skillset to develop an original quantitative research project. Specifically, they will be able to:

- Develop an empirical quantitative research question;
- Understand how data are collected and used in quantitative social science and critically assess how data collection and measurement can impact the estimates and conclusions;
- Master the statistical tools, including uni-variate and bi-variate statistics, as well as basics of multi-variate statistics;
- Gain operational skillsets to manage and process survey data with the statistical software package Stata;
- Appropriately apply the statistical tools to produce the statistical results; and
- Interpret the statistical results to make arguments and draw conclusion based on the statistical evidence for research questions.

Course Material:

Required text:

General Textbook on statistics:

- Agresti, Alan (2018). Statistical Methods for the Social Sciences, Fifth Edition. Pearson. (Ebook version is also available)

You can find information on the textbook purchase for this course at the Western bookstore's website at: <https://bookstore.uwo.ca/textbook-search?campus=UWO&term=32024&courses%5B0%5D=001/SOC9001>

Empirical Readings: Throughout the course, we will explore a set of journal articles that apply the statistical operations covered in this course to the Canadian national survey data. During the lab, we will use the Public Use Microdata Files (PUMFs) of these survey data and discuss how the researchers process them to produce statistical results, and how they interpret them to answer research questions. These readings also offer useful insights to develop research questions for the course project assignment. They are available on the Brightspace course reading.

In addition to the required texts, there are optional texts to provide alternative explanations and additional examples or problems.

General:

- Moore, David, S., W.I. Notz, and M. Fligner. 2021. *The Basic Practice of Statistics* (9th edition)
- Noack, Andrea. 2018. *Social Statistics in Action: A Canadian Introduction*. Oxford.

Using Stata:

- 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.

Statistical Software of Instruction: STATA will be used throughout the course.

STATA is available on computers located in the Social Science computing labs [1014](#), [1014B](#), [1020](#), [1038](#), and [6300](#) (see also the [Social Science Technology Services website](#)). If you would like to work on STATA for a course project from home, it is also available via MyVLab (<https://myvlab.uwo.ca/>), free of charge for the students registered in this course. You can find access information at: https://myvlab.uwo.ca/using_mfa_on_myvlab.html.

No prior knowledge on STATA is required and the lab sessions in this course will cover the basic data handling process. However, students may find it useful to explore the UCLA's Stata website to learn more of the STATA operation (<https://stats.idre.ucla.edu/stata/>).

Method of Evaluation:

There are three main components for this course.

1. Lab Exercise (2%*5=10%):

To solidify the statistical operations, *five sets* of exercises will be offered throughout the term. It will ask students to produce statistical results and interpret them by applying the operations introduced in the lab session. Students are *allowed to work in a group up to four members*. The set of the question will be announced during the labs and due on the night before the following week's class (Monday night at 11:55pm).

2. Statistical Exercise Assignment (30%): Take-home assignment

The questions will be posted on the OWL after the class on October 29th and the submission should be made on the OWL due on **Monday, November 11th** at 11:55pm.

3. Course Project (CP) Assignment 60%:

To apply the statistical concepts and tools in the real-life research context, students will develop an original course project and write an empirical research paper using a set of designated statistical tools. The assignment consists of two segments, where the final paper will be built on the previous assignment. The submissions should be made on Brightspace by 11:55pm of the due date.

- CP 1: Topic statement, review of literature, research question, hypothesis and method
20% (max. 8 pages)
Due on Friday, October 4th
- CP 2: Final paper 40% (max. 15 Pages)
Due on Friday, December 6th

Course Schedule and Readings:

(Note: This schedule is subject to change over the course of the term: and additional empirical readings will be announced throughout the course)

Week 1 (Sept. 10): Introduction

- Read Agresti Chs. 1 & 10
- Stata Lab: The basics / Multi-variate relationships

Week 2 (Sept. 17): Sampling and Measurement

- Read Agresti Ch. 2
- Stata Sources for the Secondary Data / Lab: Preparing data for analysis

Week 3 (Sept. 24): Descriptive Statistics

- Read Agresti Ch. 3
- Stata Lab: Describing data

Week 4 (Oct. 1): Probability Distributions

- Read Agresti Ch. 4
- Stata Lab: TBA

Week 5 (Oct. 8): Statistical Inference: Estimation

- Read Agresti Ch. 5
- Stata Lab: TBA

----- October 15 – Reading Week: No Class -----

Week 6 (Oct. 22): Statistical Inference: Significance Tests

- Read Agresti Ch. 6
- Stata Lab: Inferential statistics with STATA

Week 7 (Oct. 29): Comparison of Two Groups

- Read Agresti Ch. 7
- Stata Lab 4: Testing the mean difference between two groups

Week 8 (Nov. 5): Analyzing Association b/w Categorical Variables

- Read Agresti Ch. 8
- Stata Lab: Chi-square tests

Week 9 (Nov. 12): Linear Regression and Correlation

- Read Agresti Ch. 9
- Stata Lab: Scatter Plot, Regression, and Correlation

Week 10 (Nov. 19): Introduction to Multivariate Relationships and Multiple Regression

- Read Agresti Ch. 11.1, 11.2, 11.3, 12.1
- Stata Lab: Multiple regression, dummy variables

Week 11 (Nov. 26): Application of Multivariate Analysis: Statistical Control, Moderation/Interaction

- Read Agresti Ch. 11.4, 11.5, 11.6, 13.1, 13.2, 13.3, 13.4
- Stata Lab: Multiple regression, interaction models

Week 12 (Dec. 3): Application of Multivariate Analysis: Mediation/Intervening Relationships

- Reading: TBA
- Stata Lab: Multiple regression, interaction models

*****Final paper due: Friday, December 5, at 11:55pm*****

Important Policies

Policies for Assignment Deadlines

Students must submit the assignments by the deadlines specified in the course outline. In the case of medical or family emergency, which prevents assignment submission on time, please contact the instructor at the earliest convenience. Without a contact with the instructor, late submission will be subject to a penalty of 5% for each day of delay and any assignments not received within 5 days of the due date will not be accepted.

Statement on Academic Offences

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the 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 (<http://www.turnitin.com>).

Completion of Course Requirements

Course requirements must be completed by the end of the term in which the course is offered (Fall-December 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 Graduate Handbook: http://www.sociology.uwo.ca/graduate_handbook/course_information.html

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)

- **personal integrity** (following through on commitments; doing own work)

Students should also be aware of the **UWO Student Code of Conduct** found at <https://www.uwo.ca/univsec/pdf/board/code.pdf>

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 strongly 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 counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.

Health/Wellness Services

Students who are in emotional/mental distress should refer to Mental Health@Western <http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.

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 the following website:

https://www.uwo.ca/health/student_support/survivor_support/get-help.html

To connect with a case manager or set up an appointment, please contact support@uwo.ca.