The University of Western Ontario  
SOCIOLOGY 9001A  
Introduction to Multivariate Statistics  
Fall 2021  
Thursdays 2:30pm-5:30pm SSC TBA  

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Course Description  
The course will provide an introduction to the statistical concepts and techniques used in social science research. Throughout the course, students will learn how quantitative data is collected, processed, and analyzed to answer empirical questions. The course will introduce foundational statistical operations, including descriptive statistics, sampling distributions, statistical inference, correlation, and linear regression. Students will develop skillsets to apply them to secondary datasets, using Stata, a commonly-used statistical software. The lab sessions will also provide basic skillsets for data management and data handling prior to analysis, as well as basic statistical tools for data analysis.  
This course is intended to prepare students to take Advanced Multivariate Statistical Analysis (Sociology 9007) in the winter term.  

This course will be held in-person, unless it is notified otherwise.  

Learning Outcomes  
- Learn how data are collected and used in quantitative social science  
- Understand common statistical tools and become able to appropriately apply them and interpret the results  
- Thoughtfully evaluate methodology in the published sociological research using the quantitative methods  
- Acquire foundational skillsets with the statistical software package Stata to manage and process survey data as well as to produce basic statistical evidence for empirical research questions.  

Prerequisite(s):  
Students should have taken an introductory statistics course during their undergraduate education: Sociology 2205A/B and 2206A/B or the former 231 (or equivalent) and enrollment in fourth year of an Honors Specialization or Honors Double Major in Social Science. 60% in Sociology 2205A/B and 2206A/B or the former 231. If not in an Honors Specialization, a minimum grade of 70% in Sociology 2205A/B and 2206A/B or the former 231 or written permission from Department.
Course Material(s)

*Required Text:* We will rely primarily on the following textbook:


The textbook is also available for purchase. There are a few options available:
- E-book versions:
  - 180-day prescription ($64.99 plus tax)
  - Perpetual license ($94.99 plus tax)
- Printed version: ($199 plus tax)
- You are more than 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.

**Note:** The refund process for E-books is extremely complex. To avoid a cumbersome process of refund, please make sure that you have a solid decision when you purchase an E-book version. If you are thinking of, or perceiving a chance of, pursuing training in quantitative research after this course, it is suggested to purchase either a perpetual license or printed version. You can also take a look at the book in the library to decide which version will be most suited for your learning plan. For more detail on purchase of the textbook, please contact the UWO Book Store (https://bookstore.uwo.ca/textbooks-and-course-materials).

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

**General:**


**Using Stata:**


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

No prior knowledge on STATA is required. However, students may find it useful to explore the UCLA’s Stata website (https://stats.idre.ucla.edu/stata/).

Stata is accessible on your personal computer using MyVLab (follow the set-up instructions at https://myvlab.uwo.ca/). While Stata is not on the list of available software at this website, you should have access to it as a student of this course. You can also access to Stata in one of the Social Science Computing labs through a shortcut on the MyVLab Desktop. MyVLab is also accessible from your own personal computers from a website: https://myvlab.uwo.ca/setup_instructions/web_client.html

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).
Course Evaluation

There will are two main components of assignments:

*Problem sets 60% (@15% * 4 sets)*

To solidify the concepts and techniques, *four sets* of exercises will be offered throughout the term. It will include both conceptual questions as well as applied questions. Students are *allowed to work in a group up to four members*. The set of the question will be posted on the OWL’s Assignment tool after the class time (Thursday night) and due on the night before the following week’s class (Wednesday night at 11:55pm). The schedule of this assignment is listed in the section of Course Schedule. *Please be noted that the dates of the assignments may change, depending on the progress of the course. Any changes will be announced in class as will as on the course’s OWL site.*

*Course Project Assignment 40%:*

To apply the statistical concepts and tools in the real-life data analysis, students will be tasked to follow the analytical process used in a published research. There will be a selection of published articles, which use major Canadian datasets, from which students can choose. By following one paper of your choice, you will be tasked to replicate the analysis with critical assessments of their methodology. Through the replication, students will learn how researchers make various methodological decisions, and how they interpret the results and make conclusions. Such insights will be valuable not only for your future research, but also for assessing quality and validity of existing research. The detail description of this assignment will be discussed in class and the selection. The assignment will be *due on December 10th at 11:55pm.*
Course Schedule (Note: This schedule is subject to change over the course of the term)

Week 1 (Sept. 16): Introduction
- Read Agresti Ch. 1
- Stata Lab: The basics

Week 2 (Sept. 23): Sampling and Measurement
- Read Agresti Ch. 2
- Stata Lab: Preparing data for analysis

Week 3 (Sept. 30): Descriptive Statistics ***Problem Set 1***
- Read Agresti Ch. 3
- Stata Lab: Describing data

Week 4 (Oct. 7): Probability Distributions
- Read Agresti Ch. 4
- Stata Lab: TBA

- Read Agresti Ch. 5
- Stata Lab: Graphs

Week 6 (Oct. 21): Statistical Inference: Significance Tests ***Problem Set 2***
- Read Agresti Ch. 6
- Stata Lab: Inferential statistics with STATA

Week 7 (Oct. 28): Comparison of Two Groups
- Read Agresti Ch. 7
- Stata Lab 4: Testing between groups

***** Nov. 4: Reading Week – no class*****

Week 8 (Nov. 11): Analyzing Association b/w Categorical Variables ***Problem Set 3***
- Read Agresti Ch. 8
- Stata Lab: Chi-square tests

Week 9 (Nov. 18): Linear Regression and Correlation
- Read Agresti Ch. 9
- Stata Lab: Regression and correlation

Week 10 (Nov. 25): Introduction to Multivariate Relationships ***Problem Set 4***
- Read Agresti Ch. 10
- Stata Lab: Correlation and regression

Week 11 (Dec. 2): Multiple Regression and Correlation & Model Building
- Read Agresti Ch. 11 & 12
- Stata Lab: Multiple regression

*****Replication project due: Friday, December 10, at 11:55pm*****
Important Policies

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 10% for each day of delay and any assignments not received within 5 days of the due date will not be accepted.

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. See Scholastic Offences (below) for the link to Scholastic Discipline regulations.

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 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

Scholastic 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/appeals_discipline/index.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

Accommodation
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.
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 Graduate Handbook:
http://www.sociology.uwo.ca/graduate_handbook/course_information.html

Mental Health

Students who are in emotional/mental distress should refer to Health and Wellness Western for a complete list of options to obtain help: http://uwo.ca/health/mental_wellbeing/

Health and Wellness

As part of a successful graduate student experience at Western, we encourage students to make their health and wellness a priority. Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate chair), or other relevant administrators in their unit. The Wellness Education Centre (lower level UCC) assists students in finding mental health and other related resources best suited to their needs: http://se.uwo.ca/wec.html Western’s School of Graduate and Postdoctoral Studies’ Living Well website provides tips for thriving at grad school and other helpful information:
http://grad.uwo.ca/current_students/living_well/index.html

Western provides several on-campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western’s Campus Recreation Centre: http://www.westernmustangs.ca/index.aspx?path=ims# Numerous cultural events are offered throughout the year. Also, we encourage you to check out the Faculty of Music web page http://www.music.uwo.ca/, and our own McIntosh Gallery http://www.mcintoshgallery.ca/.