



## MRPE 9300B · Statistics

Winter Term 2022  
The University of Western Ontario

**Jasmine Ha**  
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Class: Mondays, 9am-12pm in Social Science Center SSC 6210  
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Although this academic year might be different, Western University is committed to a thriving campus. We encourage you to check out the **Digital Student Experience** website to manage your academics and well-being. Additionally, the following link provides available resources to support students on and off campus: <https://www.uwo.ca/health/>.

### Course Description

**Overview.** The overarching aim of this course is to equip students with the essential skills to work with statistics relevant to policy and evaluation, either on their own or as member of a team. This includes the capacity to critically consume statistical information, to conduct appropriate statistical analyses, and to communicate the analytical findings effectively. Towards that goal, we focus on the fundamental building blocks of statistics for describing and summarizing data as well as more sophisticated tools for making statistical inferences and predictions about the social world. Students will also learn to use the statistical software program Stata to develop data analysis skills and effective workflows. By the end of the course, students will be able to conduct their own analyses of real data as well as read and evaluate statistical outputs produced by others.

This course is geared towards practical applications and skills development, as such, it is *not* focused on mathematical statistics. While it is necessary to introduce mathematical notations and concepts, the emphasis will be on interpretations and practical implications. No maths skills beyond algebra are required for this course.

## Learning Outcomes

By the end of the term, students will be able to:

1. Have a general understanding of how data are collected and used in quantitative social science and policy analysis.
2. Understand common statistical concepts and analytical techniques, including practical considerations such as when and how to appropriately use them, their underlying assumptions, and how to interpret results.
3. Read and thoughtfully evaluate published statistics in social science and policy-relevant research
4. Gain basic familiarity with the statistical software package Stata in order to manage quantitative data, produce descriptive statistics, and interpret relationships between variables.

## Course Materials

**Readings.** This course will primarily use the following textbook:

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

Students are welcome use an earlier edition of the book, and to obtain the book in anyway that they prefer. An e-book version of the textbook is available for purchase at this link:

<https://www.vitalsource.com/referral?term=9780134512822>

**Stata.** Through out the course, we will use the statistical package Stata to practice. We will primarily use Stata through MyVLab on your personal laptop.

- You should have free access to the software as a Social Science student through a shortcut on the MyVLab Desktop. If you do not, please let me know.
- To set up, please follow instructions at <https://myvlab.uwo.ca/>
- Access to Stata is also available on the computers located in the graduate lab (Room SSC 6300). You are welcome to use the lab computers to work on your weekly activities and course assignments outside of class hours.
- You can also purchase a personal license of Stata to install on your computer, although this is not required. Be sure to purchase the Stata/BE version of the program (the SE or MP versions are only necessary for very large datasets, which we won't be using in this class). To purchase Stata, visit <https://www.stata.com/order/new/edu/profplus/studentpricing/>.

**Additional Materials.** Additional readings and materials will be made available through the course website on OWL.

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

**Optional Resources.** The following *optional* resources are recommended if you are looking for other explanations, more examples, or more problems to practice.

### General:

- Frankfort-Nachmias, Chava, Leon-Guerrero, Anna, and Georgiann Davis (2020). *Social statistics for a diverse society*, Ninth Edition. SAGE Publications.
- 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:

- The UCLA's Stata website: <https://stats.idre.ucla.edu/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.

## Course Evaluation

**Participation/Weekly Activities (20%).** Each class will include a hands-on practice session, which is designed to help you practice what we are learning—including what we do on Stata. *Students are expected to attend class in-person*, as this will make it a lot easier to provide technical instructions and to resolve possible glitches due to software errors or misuses.

A weekly activity worksheet will be provided to guide the practice. You need to submit the completed worksheet to earn the participation grade. The worksheets will not be evaluated based on whether you get the right answers, only that you answered all of them. *In other words, you will obtain a full participation mark if you complete the activity worksheet.* With that said, do note that you should put in reasonable efforts. Signs of haphazard work (e.g., all wrong answers, written responses not relevant to the question) may result in a zero mark for your worksheet.

The worksheet will be published on our OWL website every Monday at 9am, beginning on January 3, 2022. You have one week to complete the worksheet. In other words, the deadline to submit your weekly worksheet on OWL is the next Monday (at 9am). Late submission is not accepted for weekly activities.

I will only count *10 out of the 12* weekly activities towards your course grade. This means each student is permitted to miss or skip two weekly worksheets. This will serve as a *universal accommodation* for all students, for any reason, with no need for documentation. Once posted, the weekly worksheet will remain available on the OWL course site so students who miss or skip the specific week may practice in their own time.

**Assignments (80%).** This course is designed to maximize your practice of statistics, by working with data, computing statistics, and writing about them. As such, we do not have exams. Your performance in this course will be evaluated based on four assignments throughout the term. Each assignment is worth 20% of your final course grade.

Assignments will be posted on the OWL course site. They are posted at the beginning of the week they are listed in (e.g., Assignment 1 will be posted on Monday, January 17), and are due by the next Monday (e.g., Assignment 1 will be due on Monday, January 24 at 9 am). Students may work together, but each must turn in their own assignment. For written answers, be sure to write in your own words.

**Extra Credits.** Consider this a practice of “seeing statistics in daily life,” you can earn extra credits by contributing examples of worst or best published statistical outputs (e.g., graphs, tables) that you encounter outside of the classroom. They could be published on the news media, or in books and readings that you read for work or for another class.

You will need to share the statistical output and a brief explanation (maximum 500 words) stating why the specific output is very well (or badly) done. The example should be shared on the OWL’s site Forum. Each eligible example will give you an *extra 0.5% worth of the final grade*. With a maximum of one example per week or 12 examples total, each student can earn up to 6% in extra credits.

## How to Contact Me

If you have course-related questions that may be relevant for the whole class, it is best to ask the questions in class or to post them on our OWL course site’s Forum. If you have a specific question for me, you may contact me through OWL Messages, or send me an email (at [jasmine.ha@uwo.ca](mailto:jasmine.ha@uwo.ca).) Students are also encouraged to meet with me individually or in small groups by appointment. Please email me to schedule a time.

## Important Policies

**Assignment Deadlines.** Students must submit their assignments by the date and time stated in the course outline and on the OWL 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.

**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 (the Scholastic Offence Policy can be viewed in the Western Academic Calendar). 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 ([www.turnitin.com](http://www.turnitin.com)).

**Standards of Professional Behaviour.** It is the responsibility of all 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 UWO Student Code of Conduct found at:

<https://www.uwo.ca/univsec/pdf/board/code.pdf>

**Copyright of Lectures and Other Course Materials.** Any materials created by the instructor (e.g., videos, 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.

**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 ([https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/appealsgrad.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/appealsgrad.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 encouraged to register with Student Accessibility Services, a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both SAS 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. For more information, see <http://www.sdc.uwo.ca/ssd/>.

**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 graduate program office.

**Accessibility Options.** Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 519-661-2111, x82147 for any specific question regarding an accommodation. Information regarding accommodation of exams is available on the Registrar's website: [www.registrar.uwo.ca/examinations/accommodated\\_exams.html](http://www.registrar.uwo.ca/examinations/accommodated_exams.html).

**Mental Health.** Students in emotional/mental distress should refer to Mental Health@Western ([http://uwo.ca/health/mental\\_wellbeing/index.html](http://uwo.ca/health/mental_wellbeing/index.html)) for a complete list of options how to obtain help.

**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](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. 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/>).

**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: 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 through our OWL course website.*

<b>Week</b>	<b>Date</b>	<b>Topic</b>	<b>Readings</b>	<b>Assignment</b>
1	January 3	Welcome, Course Introduction, Why Statistics?	Agresti Chapter 1	
2	January 10	Sampling and Measurement	Agresti Chapter 2	
3	January 17	Descriptive Statistics	Agresti Chapter 3	1
4	January 24	Probability Distributions	Agresti Chapter 4	
5	January 31	Statistical Inference: Estimation	Agresti Chapter 5	
6	February 7	Statistical Inference: Significance Tests	Agresti Chapter 6	2
7	February 14	Comparison of Two Groups	Agresti Chapter 7	
<b>8</b>	<b>February 21</b>	<b>Reading week</b>		
9	February 28	Analyzing Association between Categorical Variables	Agresti Chapter 8	3
10	March 7	Correlation	Agresti Chapters 9-11	
11	March 14	Linear Regression	Agresti Chapters 9-11	
12	March 21	Multi-variate Linear Regression	Agresti Chapters 9-11	
13	March 28	Extensions and Threats to Linear Regression	Agresti Chapters 9-11	4