



## MRPE 9300B - Statistics

Winter Term 2025

The University of Western Ontario

**Sami Coksan**, Postdoctoral Associate, Network for Economic & Social Trends

**Class:** Monday 1.00 PM – 4.00 PM

**Office Hours:** Wednesday 3.00 AM – 5.00 PM & Thursday 11:00 AM – 1:00 PM, Please make a reservation for office hours at least 24 hours in advance. All you need to do is send an email. Office hours are held online via Zoom. You will be provided with an online link for this. Office hours are primarily online via Zoom. You will be provided with an online link for this. However, if you prefer to meet face-to-face, please visit me at the Social Science Center, Room #6242, after making an appointment.

**Contact Details:** scoksan@uwo.ca - Please put “MRPE 9300B” in the subject line for faster communication.

### Course Description

#### Overview.

This course aims to provide students with the skills needed to independently or collaboratively tackle policy- and practice-related questions, critically assess statistical information, and effectively communicate their results. The course emphasizes the core principles of statistical analysis to solve real-world problems in policy and practice. We will begin with basic statistical techniques for data description and summarization, gradually advancing to more complex methods for decision-making and predictions in social contexts. Students will also learn to enhance their data analysis abilities by using the Jamovi software. By the course's conclusion, students will be capable of conducting descriptive analyses of real data and interpreting statistical analyses performed by others. All courses will be taught face-to-face and will usually consist of 2 hours of lecture and 1 hour of lab.

### Learning Outcomes

1. Students will be able to master fundamental statistical concepts, understand the assumptions of analytical approaches, correctly apply these concepts in policy analysis, and comprehend statistical concepts in policy analysis reports.
2. Students will be able to analyze data sets using appropriate statistical methods and answer research questions they encounter in their fields with suitable analyses.
3. Students will be able to interpret data and solve problems they encounter with data sets.

4. Students will be able to understand under which conditions to use specific analytical techniques and how to interpret the results.
5. Students will be able to replicate what is taught in class by using the statistical program Jamovi.

## Course Materials

### Readings.

#### Textbooks:

1. Navarro, D. J., & Foxcroft D. R. (2022). Learning statistics with Jamovi: A tutorial for psychology students and other beginners. Doi: 10.24384/hgc3-7p15

This textbook is free to read. Students need to follow this edition for this course.

2. Strunk, K. K., & Mwavita, M. (2021). Design and analysis in educational research using Jamovi: ANOVA designs. Routledge.

The textbook costs approximately \$80. Students are welcome to purchase second-hand or earlier editions of this textbook. This textbook is also available in the Western Library.

3. Gravetter, F. J., Wallnau, L. B., Forzano, L. A. B., & Witnauer, J. E. (2021). Essentials of statistics for the behavioral sciences, 10<sup>th</sup> edition. Cengage Learning.

An e-book version of the textbook costs approximately \$75. Students are welcome to purchase second-hand or earlier editions of this textbook. This textbook is also available in the Western Library.

Other course materials will be delivered through in-class lectures.

#### Software:

We will use Jamovi to conduct the analyses we need. Jamovi is open-source and free-to-use software that is used widely across the globe day by day. At the beginning of our classes, I will show you how to install Jamovi on our PCs and MACs. Hence, whenever you want, you will be able to explore this amazing software! We will dedicate class time for students to work on hands-on exercises in the classroom. The Graduate computing labs are open 24/7 for you to work on take-home assignments as well. Please do not worry; No prior knowledge about Jamovi is required! All lab sessions in this course will cover basic procedures for analyzing data.

## Course Evaluation

### Quick assignments (40%)

Students will complete quick and short assignments for 4 (10% for each) data sets. Students will describe the data set.

- Conduct appropriate analyses that answer the research question.
- Report according to APA 7 format.
- Offer suggestions based on the findings revealed by the data set.

The student will need to spend an average of 60-120 minutes on each assignment maximum. A list of data sets will be provided by the lecturer. Students will select datasets from this list.

### **Midterm Exam (20%)**

Students will take a 1-hour exam individually in class. The exam will include fill-in-the-blank, multiple-choice and open-ended questions. Students can use all written resources except electronic devices during the exam. The exam will be held in class on February 24<sup>th</sup>, during our class hours.

### **Short Research Paper (40%)**

Students will develop a short research paper to demonstrate the concepts and skills learned throughout the course. In this short research paper, students will analyze and report a data set containing at least 500 observations on a topic they are interested in, in accordance with the research question, and briefly discuss it in relation to the subject. Students can use the data sets and topics given by the lecturer, or they can use real or artificial data sets they find themselves, provided that they send them to the lecturer. The assignment consists of two components:

1. Presentation (10%)
2. Report (30%)

Presentation will be held in class on March 31<sup>st</sup>, during our class hours. It is very important to complete the report taking into account the feedback given in the presentation. The deadline for the report is April 21<sup>st</sup>, unless otherwise stated. All information regarding how to write the report, what it will include, and what you should pay attention to is included in the handout that will be presented to you in the first lesson. You can access all the information you need for your report using this handout.

## **How to Contact Me**

The fastest and most efficient way to contact me is to send me an email to my email address. I usually reply to all emails within 24 hours. However, if you would like to meet in person, you can make an appointment and come to the Social Science Center, office #6242. Requests for face-to-face meetings may not always be met.

### **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.

**Attendance.** Class attendance is mandatory, with the option for students to miss a maximum of two classes without penalty. If you are absent for more than two classes, a discussion with the course instructor will be required in order to determine whether it is possible to make up the missed time or a Fail will be assigned to the course.

**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 others; 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 ([www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf)).

**Artificial Intelligence.** Unless otherwise explicitly stated by your course instructor, all assignments must be completed independently, without the aid of artificial intelligence (AI).

Suspected use of AI will result in an automatic zero on assignments and may be escalated to the Program's Director to investigate for possible scholastic offence.

**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. More details regarding incompletes are outlined in the Graduate Handbook: [http://www.sociology.uwo.ca/graduate\\_handbook/course\\_information.html](http://www.sociology.uwo.ca/graduate_handbook/course_information.html).

**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 on 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.

### **Additional Information.**

Please respect others both in and out of the classroom through words and actions (be professional, fair, and respectful in interactions with people online and in-person; understand and respect differences among classmates and colleagues; avoid disrupting the learning environment; respect others' expectations of confidentiality and privacy). Each of us may have different cultures, values, norms and beliefs. Let's enjoy this richness in our communication and respect the other person by remembering that differences are the characteristics that make us who we are.

Please do not record audio or video in class without permission! If you have such a need, please let me know and we can decide together what we can do for you.

### **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 Brightspace course website.

Date	Topic	Scope	Readings – Page Numbers from the Three Textbooks
Jan 6	Welcome! Knowledge & Scientific Knowledge	<ul style="list-style-type: none"> <li>- Let's meet!</li> <li>- What is knowledge, scientific knowledge and introduction to statistics</li> <li>- Downloading and installing Jamovi software on different operating systems and introducing the packages</li> <li>- Correlations &amp; causality.</li> </ul>	(1): Chapter 1, 2 & 3 (2): Chapter 1 & 2 (3): Chapter 1
Jan 13	Introduction to basic elements of statistics - I	<ul style="list-style-type: none"> <li>- Numbers, variables, and measuring variables</li> <li>- Introduction to working with variables, interfaces and data sets in Jamovi</li> </ul>	(1): Chapter 3 (2): Chapter 3
Jan 20	Introduction to basic elements of statistics - II	<ul style="list-style-type: none"> <li>- Population, sampling and probability</li> <li>- Data set creation and cross-tabulation in Jamovi</li> </ul>	(1): Chapter 4 & 7 (2): Chapter 4 (3): Chapter 2 & 6
Jan 27	Introduction to basic elements of statistics - III	<ul style="list-style-type: none"> <li>- Measures of central tendency and distribution</li> <li>- Calculating mean, standard deviation, standard error, variance and other values.</li> </ul>	(1): Chapter 4 (3): Chapter 3
Feb 3	Introduction to analytical approaches	<ul style="list-style-type: none"> <li>- Pre-steps for analyses</li> <li>- Identification of outliers and z-score calculation</li> </ul>	(1): Chapter 5 & 6 (3): Chapter 5
Feb 10	Hypothesis testing - I	<ul style="list-style-type: none"> <li>- Making comparisons between groups in terms of means of continuous variables</li> <li>- One-sample t-test, one-sample proportion test, independent sample t-test</li> </ul>	(1): Chapter 10 (2): Chapter 5, 6 & 7 (3): Chapter 8, 9 & 10
Feb 17	Reading Week		
Feb 24	Mid-Term Exam, Good Luck!		
Mar 3	Hypothesis testing - II	<ul style="list-style-type: none"> <li>- Let's work with more than one group or variable and make comparisons between groups.</li> <li>- One-way ANOVA, multi-way ANOVA</li> </ul>	(1): Chapter 13 & 14 (2): Chapter 8, 9, 10, 11, 17 & 16 (3): Chapter 12 & 13
Mar 10	Repeated models	<ul style="list-style-type: none"> <li>- Comparing multiple measurements of the same source</li> <li>- Repeated sample t-test, repeated ANOVA</li> </ul>	(3): Chapter 12 & 13
Mar 17	Correlation and regression models	<ul style="list-style-type: none"> <li>- Examining and understanding relationships</li> <li>- Using equations to make predictions and estimates</li> <li>- Pearson's correlation, Spearman's correlation, simple linear regression, hierarchical regression</li> </ul>	(1): Chapter 12 (3): Chapter 14
Mar 24	Statistical mediation & moderation	<ul style="list-style-type: none"> <li>- Working with a single mediating or moderating variable</li> <li>- Simple mediation analysis and simple moderation analysis</li> </ul>	
Mar 31	A different type of statistic	<ul style="list-style-type: none"> <li>- What are statistical inferences, and what are they not?</li> <li>- Current approaches, criticisms and responses to criticisms.</li> <li>- Decision tree approach</li> <li>- <b>PRESENTATIONS</b></li> </ul>	