

The University of Winnipeg
Department of Geography
GEOG- 2309 (3)- 001
September 7th to December 6th 2021

Statistical Techniques in Environmental Analysis

Lectures GEOG 2309-001 **Monday, Wednesday, Friday 8:30AM – 9:20AM**

Lab Section GEOG-2309L-**070** Monday 10:30AM – 11:20AM

Lab Section GEOG -2309L -**071** Monday 1:30PM-2:20PM

Lab Section GEOG-2309L-**072** Wednesday 10:30AM – 11:20AM

Lab Section GEOG-2309L-**073** Wednesday 1:30PM – 2:20PM

Instructor for Lectures and Labs

Professor Julie Robertson

Email

ju.robertson@uwinnipeg.ca

Office hours Via Zoom drop -in: Monday 2:30PM – 3:20PM

Office hours Via Zoom drop -in: Wednesday 2:30PM - 3:20PM

If you would like to meet on an individual basis, email me and we can set up a Zoom session or phone call.

Please note for all communication you must use your **U of Winnipeg official email**. There will be no communication from emails accounts such as Hotmail and Gmail which are often tagged as SPAM .

Check your official U Winnipeg email daily.

Read Carefully: You are responsible for reading everything listed in this course outline, PowerPoints, emails, information on Nexus and lecture notes.

Fun Fact: We will learn about causation and correlation. There is a positive correlation between how well you do in statistics and attending lectures and labs. This means as attendance increases there is a greater probability that your understanding of course material will increase!

Course Description

GEOG2309(3) STATISTICAL TECHNIQUES IN ENVIRONMENTAL ANALYSIS (Le3,La1) Statistics describe and summarize data, and make predictions about a population from the information contained in samples. This course provides a working understanding of the elementary statistical techniques and computational procedures for students with little background in mathematics and focuses on the application of these tools for the analyses of geographical and environmental data. Topics include: scales of measurement, univariate statistics, time series analysis, probability, sampling design, hypothesis testing, regression and correlation analysis, and models as quantitative techniques **GEOG 2309L (Lab must be take concurrently)**

Prerequisites: GEOG 1102(3) or GEOG 1103(3), or GEOG 1201(3) or GEOG 1202(3) or permission of the instructor.

Restrictions: Students with standing in the former GEOG 2310(3) may not receive credit for GEOG 2309 (3)

Course Objectives

This course is designed to help you learn statistical skills and the underlying theoretical principals. The broad objective is to learn how to use data to solve problems and answer questions.

Learning outcomes:

- Learn how to analyse data and extract information.
- Learn to analyse patterns in data and develop critical thinking.
- Gain knowledge of the qualitative and quantitative methods that geographers use to understand geographic phenomena.
- You will be able to demonstrate proficiency of basic descriptive, inferential, multivariate, and spatial statistic methods.

Required Textbook

Chapman McGrew Jr, A.J. Lemon & C.B. Moore, 2104. And introduction to statistical problem solving in geography, 3rd edition, Waveland Press Inc. ISBN 13:978-1-4786. ISBN10: 1-4768-1119-7

Previous editions of the textbook are acceptable.

Due Date	Assignment Description	Marks
October 20	Midterm	25%
Weekly	Lecture assignments 10 throughout the term (1%) each	10%
Variable	6 Labs	35%
December 6	Final Project Due	30%

The final date to withdraw from the course without academic penalty is **Tuesday, November 16, 2020. Please note that withdrawing before the VW date does not necessarily result in a fee refund.*

Final grades will be assigned based on accumulated marks allocated throughout the term. Letter grades are typically determined using the following number groupings as guidelines:

A+ = 90 -100%	B+ = 77 - 79.9%	C+=67 – 69.99%	D+= 57 -59.99%	F = less than 50%
A = 85 – 89.9%	B = 73 – 76.9%	C = 63 – 66.9%	D = 53 – 56.9%	
A- = 80 – 84.9%	B- =70 - 72.99%	C- = 60 - 62.99%	D-= 50 52.99%	

*Please note that the numeric boundaries separating letter grades may be altered at the request of the Department Review Committee or University Senate.

Online Classroom etiquette

Please log in on time with the links to Zoom that you will be sent prior to class beginning.

Keep your microphone muted unless you are asking a question

If you are late, come into the meeting with your mic muted.

Be respectfully to your colleagues

Participate in the short group lessons during lecture

Nexus

All documents related to this course (eg. Course syllabus, supplemental readings, lab assignments, data sets, google forms , google polls & required videos) will be made available to students through the Nexus system, You must be registered in the course to have access to these materials. To login to Nexus, go to:

<http://nexus.uwinnipeg.ca/>

If you encounter difficulties with Nexus contact the help desk at 204-786-9149 or help.desk@uwinnipeg.ca

Assignment Information

Lectures:

There will be 10 lecture assignments throughout the semester. They be individual or groups which will be randomly assigned on Zoom. These are short activities. Each person must upload the assignment online before the end of the lecture period. These are pass/fail assignments and total 10% of the final grade.

Any assignments submitted late (after the end of the class) will not be accepted.

Labs:

There are **6 Lab assignments** which are based on the material covered in lectures and build upon knowledge as the course progresses through the semester.

Lab Due Date	GEOG2309L-070 Monday 10:30AM	GEOG2309L- 071 Monday 1:30PM	GEOG2309L-072 Wednesday 10:30AM	GEOG2309L-073 Wednesday 1:30PM
Lab 1	Sept. 20, 10:00AM	Sept 20, 1:00PM	Sept. 22 10:00AM	Sept 22, 1:00PM
Lab 2	Sept 27, 10:00AM	Sept 27, 1:00PM	Sept 29 , 10:00AM	Sept 29, 1:00PM
Lab 3	Oct 4, 10:00AM	Oct 4, 1:00PM	Oct 6, 10:00AM	Oct 6, 1:00PM
Lab 4	Oct 25, 10:00AM	Oct 25, 1:00PM	Oct 27, 10:00AM	Oct 27, 1:00PM
Lab 5	Nov 8, 10:00AM	Nov 8 1:00PM	Nov 10 , 10:00AM	Nov 10, 1:00PM
Lab 6	Nov 22, 10:00AM	Nov 22, 1:00PM	Nov 24, 10:00AM	Nov 24, 1:00PM

All assignments must be submitted using your name that is associated with the registrar’s office, accompanied by your student number, the date, and the correct naming format.

*** Late submissions will NOT be accepted for grading (except in exceptional and documented circumstances) and as a consequence , a grade of “ zero” will be recorded.**

All assignments will be graded within two weeks of submission.

Proposed Topics: Subject to change

Week Begins	Topic	Labs	Reading
Sept 5 – WK1	What are statistics and why do we use them?	No Labs	Chapter 1 Youtube video The Best Stats you have ever seen, Hans Rosling https://www.youtube.com/watch?v=hVimVzgtD6w
Sept 12 Wk2	Levels of Measurement: Characteristics and Preparation of data	Lab 1 measurements based on class survey data	Chapter 2
Sept 19 Wk3	Measures of Centre (Descriptive statistics)	Lab 2 Measures of central tendency	Chapter 3/4
Sept 26 Wk 4	Measures of Dispersion	Lab 3 Measures of dispersion	Chapter 3/4
Oct 3 Wk 5	Spatial Descriptive Statistics	Lab 4 Spatial measures	Chapters 3/4

Oct 10 Wk 6	READING WEEK		
Oct 17 Wk 7	Inferential Statistics- Probability	Midterm Oct 20	Chapters 5/6
Oct 24 Wk 8	Inferential Statistics – Distributions	Lab 5 Probability distributions	Chapters 5/6
Oct 31 Wk 9	Sampling and Confidence Intervals		Chapters 7/8
Nov 7 Wk 10	Test of Differences – Hypothesis testing	Lab 6 Sampling / means	Section IV
Nov 14 Wk 11	Test of Differences of Means	Final Project	Section IV
Nov 21 Wk 12	Test of Relationships – Spatial Patterns		Section V
Nov 28 Wk 13	Correlation		Section VI
Dec 5 Wk 14	Final Project due	December 6, 2021	None

SENATE REGULATIONS

Senate regulations, which apply to all courses, require that the following information be included in course outlines:

1. An indication of the topics to be covered.
2. An indication that all topics listed on the outline may not be covered.
3. A reading list or other indication of the amount of reading expected in the course.
4. A list of all items of work on which the final grade is based and an indication of the weight of each individual item of work.
5. Final grades in pass/fail courses include S (Standing) or F (Failure). Senate approved grades for all other courses include A+, A, A-, B+, B, C+, C, D and F. While the University does not have a standardized numerical grade conversion scale for letter grades, all course outlines must include written guidelines specifying a numerical (percentage) range for letter grades assigned to individual items of work and the course final grade. Final grades shall be approved by the Department Review Committee and may be subject to change.
6. If students are to be given marks for participation and/or attendance, students must be provided with clear assessment criteria.
7. An indication of when the items of work will be administered/submitted, and penalties, if any, for late submission of work. A minimum of 20% of the work on which the final grade is based must be evaluated and available to the student before the voluntary withdrawal date. Exceptions may be made with the

prior approval of the DRC in courses such as Directed Readings, Projects, and Thesis courses, but this must be noted on the course outline.

8. An indication of equipment authorized for use in tests/exams (e.g., calculators, dictionaries, handheld devices).
9. Regarding the date of the last test/exam or the due date for the last item of work, such as an essay or project, be advised that Senate does not allow term tests to be administered during the 12th week of regularly scheduled classes (i.e., during the last 3 hours of the course); such tests must be administered during the exam period (the two weeks, or so, following the 12th week of lectures). However, the last item of work (e.g., research paper, essay) may be submitted at the last class, or at a specified time up to and including the scheduled final examination date. Lab exams may be held during the 12th week and on the days between the last scheduled class and the final exam period.
10. The voluntary withdrawal date, without academic penalty:

November 16, 2021 for Fall courses which begin in September 2021 and end in December 2021;

Please contact me prior to making the decision to withdraw from the course.

11. The dates the University is closed for holidays, irrespective of campus closure related to COVID-19:
**September 6 (Labour Day), September 30th (Truth & Reconciliation Day) , October 11th (Thanksgiving Day), November 11 (Remembrance Day),
Fall mid-term reading week is October-10-16;**
12. Students may choose not to attend classes or write examinations on holy days of their religion, but they must notify their instructors at least two weeks in advance. Instructors will then provide opportunity for students to make up work or examinations without penalty. A list of religious holidays can be found in the 2021-22 Undergraduate Academic Calendar.
13. Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams or during lectures/laboratories are encouraged to contact Accessibility Services (AS) at 204.786.9771 or <https://www.uwinnipeg.ca/accessibility-services/> to discuss appropriate options. All information about a student's disability or medical condition remains confidential.
14. Reference to the appropriate items in the Regulations & Policies section of the *Course Calendar*, including Senate appeals and academic misconduct (e.g. plagiarism, cheating) <https://www.uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf> Instructors should become familiar with the procedures for dealing with alleged academic misconduct at <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-procedures.pdf>
15. All students, faculty and staff have the right to participate, learn, and work in an environment that is free of harassment and discrimination. The UW Respectful Working and Learning Environment Policy may be found at <https://www.uwinnipeg.ca/respect/>.



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1. A permitted or necessary change in mode of delivery may require adjustments to important aspects of course outlines, like class schedule and the number, nature, and weighting of assignments and/or exams.
2. Students can find answers to frequently asked questions related to remote learning here: <https://www.uwinnipeg.ca/covid-19/remote-learning-faq.html>.
3. If you assign a grade for participation, please set clear expectations for students, depending on the mode of delivery.
4. The method of delivery and submission of graded work should be specified, as well as the type of equipment/resources authorized for use in tests/exams.
5. When it is necessary to cancel a class due to exceptional circumstances, every effort will be made to inform students via UWinnipeg email (and/or using the preferred form of communication, as designated in this outline).
6. Students have the responsibility to regularly check their UWinnipeg e-mail addresses to ensure timely receipt of correspondence from the University and/or their course instructors.
Please contact me using my UWinnipeg email ju.robertson@uwinnipeg.ca
7. Please note that withdrawing before the VW date does not necessarily result in a fee refund.
8. The first day of class is [date]. Last class will be held on [date]. Make-up classes will be held on [list the dates]. Evaluation period is [dates].
[See <https://www.uwinnipeg.ca/academics/calendar/docs/dates.pdf> for all dates]
9. Tests should not be scheduled nor assignments due during either Reading Week.
10. **Regulations, Policies, and Academic Integrity.** Students are encouraged to familiarize themselves with the “Regulations and Policies” found in the University *Academic Calendar* at: <https://uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf>. Particular attention should be given to subsections 8 (“Student Discipline”), 9 (“Senate Appeals”), and 10 (“Grade Appeals”). Please emphasize the importance of maintaining academic integrity, and to the potential consequences of engaging in plagiarism, cheating, and other forms of academic misconduct. Even “unintentional” plagiarism, as described in the UW Library video tutorial “Avoiding Plagiarism” (<https://www.youtube.com/watch?v=UvFdxRU9a8g>) is a form of academic misconduct. Similarly, uploading essays and other assignments to essay vendor or trader sites (filesharing sites that are known providers of essays for use by others who submit them to instructors as their own work) is a form of misconduct, as it involves “aiding and abetting” plagiarism. More detailed information can be found here:

Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-procedures.pdf>.

Clear expectations for assignments, tests, and exams should be set for students to avoid instances of “unintentional” misconduct. For instance, if an exam is “take-home”, students should be advised on permitted resources, being able to collaborate (or not) with other students, etc.

11. **Respectful Learning Environment.** Students are expected to conduct themselves in a respectful manner on campus and in the learning environment irrespective of platform being used. Behaviour, communication, or acts that are inconsistent with a number of UW policies (*e.g. Respectful Working and Learning Environment Policy* <https://www.uwinnipeg.ca/respect/respect-policy.html>, *Acceptable Use of Information Technology Policy* <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/acceptable-use-of-information-technology-policy.pdf>) could be considered “non-academic” misconduct. More detailed information can be found here:

Non-Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-procedures.pdf>.

Instructors whose mode of delivery includes Zoom or a similar platform should clarify expectations for appropriate “remote classroom” behaviour or decorum (being on time, muting/unmuting, raising hand, reacting, etc.), and make appropriate allowances in order to respect the privacy of students (*e.g.* clarifying need to have video on/off).

12. **Copyright and Intellectual Property.** Course materials are the property of the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, and presentation slides—irrespective of format. Students who upload these materials to filesharing sites, or in any other way share these materials with others outside the class without prior permission of the instructor/presenter, are in violation of copyright law and University policy. Students must also seek prior permission of the instructor/presenter before, for example, photographing, recording, or taking screenshots of slides, presentations, lectures, and notes on the board. Students found to be in violation of an instructor’s intellectual property rights could face serious consequences pursuant to the *Academic Misconduct or Non-Academic Misconduct Policy*; such consequences could possibly involve legal sanction under the *Copyright Policy* (https://copyright.uwinnipeg.ca/docs/copyright_policy_2017.pdf).
13. **Research Ethics.** Students conducting research interviews, focus groups, surveys, or any other method of collecting data from any person, including a family member, must obtain research ethics approval before commencing data collection. Exceptions are research activities done in class as a learning exercise. For submission requirements and deadlines, see <http://www.uwinnipeg.ca/research/human-ethics.html>
14. **Privacy.** Students should be reminded of their rights in relation to the collecting of personal data by the University (<https://www.uwinnipeg.ca/privacy/admissions-privacy-notice.html>), especially if Zoom is being used for remote teaching (<https://www.uwinnipeg.ca/privacy/zoom-privacy-notice.html>) and testing/proctoring (<https://www.uwinnipeg.ca/privacy/zoom-test-and-exam-proctoring.html>).