

## GEOG 3210A – Geocomputation Course Outline: Section 001 Fall 2023

### 1. Course Information

\*Details about design and delivery of the course are listed below in Section 6



Classes Start	Fall Reading Week	Classes End	Study day(s)	Exam Period
September 7	October 30-November 5	December 8	December 9	December 10-22

September 15, 2023: Last day to add a second-term half course

October 9, 2023: Thanksgiving Holiday

November 13, 2023: Last day to drop a first term half course without penalty



Course Instructor	Contact Information	Office Hours
Milad Malekzadeh	<a href="mailto:mmalekz4@uwo.ca">mmalekz4@uwo.ca</a>	Wednesdays 13:00-15:00

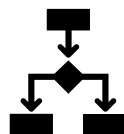
Teaching Assistant(s)	Contact Information	Office Hours
TBD	TBD	TBD

### 2. Calendar Description

An introduction to multivariate statistics and data analysis using computational methods; reproducibility in data analysis, data presentation, exploratory data analysis, and data mining for Geography.

**Antirequisite(s):** All other senior level statistics courses numbered 2000 or above and not listed in the prerequisites.

**Prerequisite(s):** Geography 2210A/B or Biology 2244A/B or Statistical Sciences 2244A/B and enrolment in a geography program or permission from the instructor.



**Extra Information:** 2 lecture hours, 2 laboratory hours.

Prerequisite checking is the student's responsibility

Senate Regulations state, "unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites."

### 3. Textbook

(Optional) Rogerson, P. A. (2019) Statistical Methods for Geography: A Student's Guide. SAGE Publications. Fifth Edition. pp 432. Paperback ISBN: 9781526498809.



Textbook Website: <https://us.sagepub.com/en-us/nam/statistical-methods-for-geography/book268777>

All other material will be posted on the OWL course website.

### 4. Course Objectives and Format

#### Course Objectives:

- I. To develop a working knowledge of statistical concepts as applied to geographical data.
- II. To become competent in data visualization and exploratory (spatial) data analysis.
- III. To understand issues with performing statistical analysis on geographical data.
- IV. To learn new computational skills, specifically the statistical software R, along with RStudio.

Although mathematical detail is not emphasized, competence in simple mathematical notation and arithmetic are fundamental. All computations will be performed using statistical software. The primary piece of software we will be using is R and RStudio.

#### Course Format:

Lectures: In person lectures, online videos, live tutorials, and readings

Labs: 2 hrs (In person delivery, demonstration and supported work time).

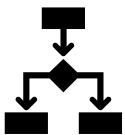
#### Expectations:

- Engagement with lecture and lab material is imperative to success in this course.
- The course material is cumulative.
- You should review lectures and readings weekly.
- It is the student's responsibility to cover any material missed by failure to attend lectures, please also see all material on the course website.
- Students must be organized, especially with computer files, please seek help if you are struggling with this component.

All course material will be posted to OWL: <http://owl.uwo.ca>. Any changes will be indicated on the OWL site and discussed with the class.

Google Chrome or Mozilla Firefox are the preferred browsers to optimally use OWL; update your browsers frequently. Students interested in evaluating their internet speed, please click [here](#).

If students need assistance, they can seek support on the [OWL Help page](#). Alternatively, they can contact the [Western Technology Services Helpdesk](#). They can be contacted by phone at 519-661-3800 or ext. 83800.



## 5. Learning Outcomes

Upon successful completion of this course, students will be able to:

- Analyse quantitative geographical and statistical data
- Make informative graphical visuals using various data types
- Perform statistical tests to compare between different groups
- Fit regression models (linear and non-linear) using multiple covariates
- Perform exploratory (spatial) data analysis, such as cluster analysis
- Code statistical tests in R using the RStudio environment
- Interpret statistical results from the work of others



## 6. Course Content and Schedule

### Lecture Content (Tuesday; 12:30-14:30)

Date	Topic	Reading Material
Sep 12	Geocomputation, Course Overview	Ch. 1, Ch. 2
1	<u>(Online, asynchronous)</u>	
2 Sep 19	Visualizing Data	Ch. 3
3 Sep 26	Probability	Ch. 4, Ch. 5
4 Oct 3	Statistical Tests	Ch. 6
5 Oct 10	Advanced R	--
6 Oct 17	Correlation and Linear Regression	Ch. 7
7 Oct 24	Multivariate Regression	Ch. 9 (Sec. 9.1-9.5)
8 Oct 31	Reading Week, No Lecture	--
9 Nov 7	Logistic Regression	Ch. 8, Ch. 9 (Sec. 9.6)
10 Nov 14	Maps in R	--
11 Nov 21	Multivariate Cluster Analysis	Ch. 12
12 Nov 28	Regionalization	--
13 Dec 5	Geocomputation	--

Only **the first session** will be online, asynchronous, via uploaded videos to OWL. Other sessions will be held in person.

### Labs (Tuesday; 16:30 – 18:30)

Lab Date	Topic	Relevant Swirl Lessons
1 Sep 12	Data Analysis in R	1 – 6
2 Sep 19	Visualizing Data	7, 12, 15
3 Sep 26	Data Analysis in R II	8 – 11
4 Oct 3	Probability and Statistical Tests	
5 Oct 10	Assignment 1 Help	

6	Oct 17	Linear Regression
7	Oct 24	Multivariate Regression
8	Oct 31	<b>Reading Break, No Lab</b>
9	Nov 7	Logistic Regression
10	Nov 14	Assignment 2 Help
11	Nov 21	Cluster Analysis
12	Nov 28	Regionalization
13	Dec 5	Assignment 3 Help

## 7. Communication



All material and communication will be administered via the OWL site.

Technical help and course related Q&A will be provided through OWL discussion forums so that other students can benefit from questions and answers. Both the instructor and TA will check forums regularly.

For any other communication, the centrally administered **e-mail account** provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner. You can read about the privacy and security of the UWO email accounts [here](#).

## 8. Evaluation

Below is the evaluation breakdown for the course. Any deviations will be communicated.

Evaluation Components	Weight (%)	Due Date
<b>1. Labs</b>	10%	Various
<b>2. Assignment 1</b>	20%	Friday, October 13
<b>3. Assignment 2</b>	20%	Friday, November 17
<b>4. Assignment 3</b>	20%	Friday, December 08
<b>5. Final Exam (take home)</b>	30%	TBD



Students are responsible for material covered in the lectures as well as the assigned chapters/sections in the text.

All assignments are due at 11:55 pm EST unless otherwise specified

Written assignments will be submitted to Turnitin (statement in policies below)

Students will have unlimited submissions to Turnitin

Rubrics will be used to evaluate assessments and will be posted with the instructions  
After an assessment is returned, students should wait 24 hours to digest feedback before contacting their evaluator; to ensure a timely response, reach out within 7 days

Click [here](#) for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.

**Information about late or missed evaluations:**

Late assessments without illness self-reports will be subject to a late penalty 10%/day

**Grades will not be adjusted on the basis of need. It is important to monitor your performance in the course. Remember: *You* are responsible for your grades in this course.**

## 9. Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The accommodation policy can be found here: [Academic Accommodation for Students with Disabilities](#).

### **Academic Consideration for Student Absence**

The University recognizes that a student's ability to meet their academic responsibilities may, on occasion, be impaired by medical illness. Illness may be acute (short term), or it may be chronic (long term), or chronic with acute episodes. The University further recognizes that medical situations are deeply personal and respects the need for privacy and confidentiality in these matters. However, in order to ensure fairness and consistency for all students, academic accommodation for work representing 10% or more of the student's overall grade in the course shall be granted only in those cases where there is documentation indicating that the student was seriously affected by illness and could not reasonably be expected to meet their academic responsibilities.

#### Policy on Academic Consideration for Medical Illness - Undergraduate Students

##### Student Medical Certificate (SMC)

##### **Milad's Extension Policy:**

Every student will be allowed to submit an assignment late one time. You will have up to 2 days to get your assignment in late. No need to email the instructor, the TA will identify this the first time you submit late. No questions will be asked. Any additional extensions or longer extensions will require formal academic consideration, otherwise late penalty will apply.

##### **Religious Accommodation**

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the [Western Multicultural Calendar](#).

## 10. Make-up Examinations

Makeups will be granted with approved documentation only. All documentation for missed exams must be provided to the Academic Counselling Office within 48 hours of the scheduled exam, otherwise the instructor will assign a grade of zero.

The format and content of make-ups may differ substantially from the scheduled test or examination.

## 11. Use of Electronic Devices

Electronic devices will be allowed and are necessary for all forms of assessment.

## 12. How to Be Successful in this Class:

Students enrolled in this class should understand the level of autonomy and self-discipline required to be successful.

1. Invest in a planner or application to keep track of your courses. Populate all your deadlines at the start of the term and schedule time at the start of each week to get organized and manage your time.
2. Make it a daily habit to log onto OWL to ensure you have seen everything posted to help you succeed in this class.
3. Take notes as you go through the lesson material. Keeping handwritten notes or even notes on a regular Word document will help you learn more effectively.
4. Connect with others. Try forming a study group and try meeting on a weekly basis for study and peer support.
5. Do not be afraid to ask questions. If you are struggling with a topic, check the online discussion boards or contact your instructor(s) and or teaching assistant(s).
6. Reward yourself for successes. It seems easier to motivate ourselves knowing that there is something waiting for us at the end of the task.



## 13. Continuity of Education Plan (in-person class pivoting to online learning)

In the event of a COVID-19 resurgence during the course that necessitates the university to direct courses move away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

## 14. 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.

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> ).

## 15. Western's Commitment to Accessibility

The Department of Geography and Environment strives at all times to provide accessibility to all faculty, staff, students and visitors in a way that respects the dignity and independence of people with disabilities.

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 519-661-2147 for any specific question regarding an accommodation. Information regarding accommodation of exams is available on the Registrar's website.

More information about "Accessibility at Western" is available.

## **16. Mental Health**

If you or someone you know is experiencing distress, there are several resources here at Western to assist you. Please visit Western's Health and Wellness website for more information on mental health resources.

## **17. Support Services**

Western's Support Services  
Student Development Centre

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at [https://www.uwo.ca/health/student\\_support/survivor\\_support/get-help.html](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](mailto:support@uwo.ca).

## **18. Important Dates**

September 7: Classes resume

September 15: Last day to add a first term half course

October 9: Thanksgiving Holiday – Department Office Closed

October 30-November 5: Fall Reading Week (No classes; Department Office open)

November 13: Last day to drop a first term half course without penalty

November 30: Last day to drop a full course without penalty

December 8: Classes end

December 9: Study day

December 10-22: Examination Period