

GEOG 3210 A - Geocomputation Course Outline: Section 001 Fall 2020

1. Course Information

1.1. Classroom Location and Time:

Lectures: Asynchronous

Labs: Synchronous, Online

Zoom, Tuesday 16:30 – 18:30

1.2. Contact Information:

Instructor: Jed Long

Office: SSC 2405

Zoom Office Hours: Tuesday, 15:00 – 16:00

Email: jed.long@uwo.ca

TA: Ben Klar

Office Hours: TBA

Email: bklar3@uwo.ca

2. Calendar Description

2.1. Course 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.

Online Lectures, 2 lab hours, 0.5 course

Antirequisite(s): All other senior level statistics courses numbered 2000 or above.

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.

Prerequisite checking is the student's responsibility.

2.2. Senate Regulations

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. (2015) Statistical Methods for Geography: A Student's Guide. SAGE Publications. Fourth Edition. pp 396. Paperback ISBN: 978-1446295731.

Textbook Website:

<https://study.sagepub.com/rogerson4e/student-resources/inferential-statistics>

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: Asynchronous online content: zoom lectures, online videos, live tutorials, and readings

Labs: 2 hrs (synchronous 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.

Lecture Content

Week Of	Topic	Reading Material	
1	Sep 7	Geocomputation, Review, Course Overview	Ch. 1, Ch. 2
2	Sep 14	Visualizing Data	Ch 3
3	Sep 21	Advanced Use of R	--
4	Sep 28	Probability	Ch. 4, Ch. 5
5	Oct 5	Statistical Tests	Ch. 6
6	Oct 12	Correlation and Linear Regression	Ch. 7
7	Oct 19	Multivariate Regression	Ch. 9 (Sec. 9.1 – 9.5)
8	Oct 26	Logistic Regression	Ch. 8, Ch. 9 (Sec. 9.6)
9	Nov 2	Reading Break, No Class	--
10	Nov 9	Maps in R	--
11	Nov 16	Multivariate Cluster Analysis	Ch 12
12	Nov 23	Regionalization	--
13	Nov 30	GeoComputation	--
14	Dec 7	Exam Review	--

Labs (Tuesdays; 16:30 – 18:30)

Lab Date	Topic	Relevant Swirl Lessons	
1	Sep 8	No Lab	
2	Sep 15	Data Analysis in R	1 – 6
3	Sep 22	Visualizing Data	7, 12, 15
4	Sep 29	Advanced R	8 – 11
5	Oct 6	Probability and Statistics	
6	Oct 13	Assignment 1 Help	
7	Oct 20	Linear Regression	
8	Oct 27	Multivariate Regression	
9	Nov 3	Reading Break, No Lab	
10	Nov 10	Logistic Regression	
11	Nov 17	Assignment 2 Help	
12	Nov 24	Cluster Analysis	
13	Dec 1	Regionalization	
14	Dec 8	Assignment 3 Help	

5. Learning Outcomes

- 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. Evaluation

Evaluation Components	Weight (%)	Due Date
1. Labs	10%	Various
2. Assignment 1	20%	Friday, October 16
3. Assignment 2	20%	Friday, November 20
4. Assignment 3	20%	Friday, December 11
5. Final Exam	30%	TBD

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

Late assignments will be face deductions at the rate of 10% per day late.

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.

7. 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

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the term, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student's final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are *not* met, students will need to provide a Student Medical Certificate if the absence is medical, or provide appropriate documentation if there are compassionate grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For Western University policy on Consideration for Student Absence, see [Policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs](#)

and for the Student Medical Certificate (SMC), see:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

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](#).

8. Use of Electronic Devices

Final exam will be of the take home variety.

9. 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](#).

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

10. Western's Commitment to Accessibility

The Department of Geography 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.

11. 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.

12. Support Services

Student Support Services

Student Development Services

13. Technical Requirements

Recommended technical specifications are available at:

<https://registrar.uwo.ca/academics/timetables.html>

14. Important Dates

See Western's Academic Calendar.