

Winter 2024 - Introduction to Quantitative Research - GEOG/ENST 2006

Department of Geography and Environmental Studies

Instructor: Koreen Millard koreenmillard@cunet.carleton.ca

Office hours: Tuesdays 10 - 11 AM in Loeb A301D

Lecture Time: Mondays & Wednesdays 13:35 - 14:25

Labs:

A01: Fri 08:35 - 10:25

A02: Fri 12:35 - 14:25

A03: Thu 14:35 - 16:25

Lecture Location: Southam Hall 518

TAs: Yasaman Amini and John Foster

TA office hours: TBD

Textbook: Harris and Jarvis (2011/2013), Statistics for Geography and Environmental Science (print copies and freely available as an electronic copy through the library)

Course Description: In this course, we will introduce quantitative analysis in geography. This includes how we measure, collect and store data, display, visualize and analyze data and results. We will also learn some common statistical analysis techniques for analyzing geographical and environmental data.

In the Winter 2024 version of this course, elements of “gamification” and game-based learning have been added to GEOG2006. You should come to each lecture prepared to try new learning strategies, work both independently and in groups and problem-solve. For some of these exercises you will need access to a device in the lecture period (e.g. a smartphone, tablet or ideally a laptop). If you do not have one of these available, please contact the instructor as we have options for sharing devices.

To tackle the challenge of learning quantitative geography, we will use summiting Mount Everest as an analogy. In class, we will work in groups to progress through the 7 “camps” that climbers use to complete the hike up the world’s highest peak. Your progression from base camp to the peak will gain you and your group points, and the group with the highest number of total points will win a (small) prize at the end of the semester.

II. Prerequisites: ENST2006, STAT2507, STAT2606, ECON2200 (1.0 credit), ECON2 , ECON2202, PSYC2002, PSCI2702, BIT2000, BIT2100 (no longer offered), BIT2300 (no longer offered), NEUR2002

III. Learning Outcomes:

Participation in this course provides opportunities to:

1. Review and apply fundamental numeracy skills;
2. Undertake data collection, manipulation, storage and visualization techniques;
3. Practice and apply concepts of principles of probability theory, statistical inference, hypothesis testing and correlation to geographical data

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4. Identify and evaluate the strengths and weaknesses of different statistical techniques and select appropriate methods for specific geographic research questions

V. Evaluation:

See the draft schedule below for a description of the units in this course. Unit 1 (1 week) is introductory, Unit 2 (1 week) is a review of Foundational concepts.

In Units 3 - 6(a & b) are each 2 weeks long and structured as follows:

- Monday1: Guest lecture + in-class exercise
- Wednesday1: introduction of the material in class + in-class exercise
- Monday2: in-class exercise
- Wednesday2: "review presentations", student-led exercise and peer feedback

In Unit 7 we will explore an Indigenous Learning Bundle and undertake a group assignment.

Based on the scenario of summiting Mount Everest, your combination of individual and group points will be equated to your final grade. The course will be graded out of 100 but there are 130 total points that you can collect throughout the semester, enabling you to pick and choose some assignments. Certain assignments are required and others are optional. You need to attempt at least a total of 60 points through individual assignments and 30 points through group assignments (see below). The rest of the points you gain can be a combination of any of the optional group or individual exercises that you choose. It is your responsibility to keep track of your individual points.

For example, this is a list of potential assignment types we *may* use in this course:

- Mandatory Individual Assignments/activities:
 - Quizzes based on lectures and readings (6) - required, total 18 points
 - Lab assignments (6) - required, total 30 points
 - Final Exam - practical - to be held in last lab period - required, total 12 points
- Optional Individual Assignments/activities (each 1 point):
 - Reflect on the "muddiest point" - 1 point each
 - Take part in WooClap polls (similar to PollEverywhere) - 1 point each
 - Listen to a podcast and write reflection
 - Create a tiktok style video teaching a technique or application of technique
 - Evaluate and reflect on the outputs of ChatGPT
 - Take an online course (DataCamp, Khan Academy) and reflect on the connections to the course concepts
- Mandatory Group assignments/activities:
 - Unit Review exercise - required, total 15 points, peer feedback
 - Apply your learning exercise - required, total 15 points.
- Optional Group assignments/activities (points vary):
 - Create flashcards to help learn theoretical concepts
 - Design a "bingo" card and play in class
 - Play Jeopardy as a Team
 - Think-Pair-Share (participation based)
 - Peer-to-Peer teaching (peer feedback)

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Some of the optional assignments may be offered more than once (e.g. there may be several opportunities to listen to podcasts and reflect; we may play Jeopardy more than once in class).

Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean.

Late Policy: All assignments must be submitted through the Brightspace dropbox by the due date and time. No late assignments will be accepted, with the exception of those cases where a student is sick or if you have already arranged for academic accommodation as described in subsequent sections of this syllabus. In the case of illness, you must make arrangements with the course instructor prior to the due date/time. In place of a doctor's note or medical certificate, students are advised to complete the [self-declaration form](#) available on the Registrar's Office website to request academic accommodation for missed coursework including exams and assignments.

Lecture/Lab attendance: We will use a "flipped" classroom style. Before the first lecture period in each unit, you should review several short lecture videos on Brightspace and read the required textbook readings. You will need to complete a quiz related to this material before the M1 lecture period as well. You should attend all lecture and lab periods in person - excluding times when you are sick. No sick notes are required - simply fill out the Self Declaration form. In these periods we will demo software, play games and do exercises together. There will be in-class exercises completed during these periods, and they will have points associated with them. Some of these may be graded using peer feedback, you may be required to carry out group work, and you may need to present results to the class. If you miss a class due to illness, it is not possible to make up the in-class exercises, however there are options for other exercises (documented above). Lab attendance is also required, with the exception of illness. If you miss a lab due to illness you will need to catch up on your own time.

Getting help outside of class: The best place to get one-on-one help is in the lecture period or lab period. The instructor will be available during the lecture periods, and the TAs will be available during the lab periods. Outside of class the instructor and the TAs both have office hours that you can visit to get extra help. You should contact the instructor over email to discuss any personal matters (e.g. accommodations, sickness). If you need technical help, please post ALL questions in the forum. The Brightspace forums enable everyone to benefit from reading the answer to your technical question - it is likely that others have the same questions you have!

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VI. Course calendar (tentative: dates and topics subject to change):

Lectures	day of week	Challenge	Unit	Readings	Lab content	Due Dates	Guest Lecture
08-Jan	M1	Base Camp	Unit 1: Introductions	Chapter 1	No lab		
10-Jan	W1				No lab		
15-Jan	M1	Camp II	Unit 2: Foundations	2.1, 2.2	Start Unit 2 Lab		
17-Jan	W1				Unit 2 Lab		
22-Jan	M1	Camp III	Unit 3: Getting Started	2.4, 2.5, 2.6, 2.7, 2.8	Start Unit 3 lab	Unit 2 Lab due	StatsCan - Census of the Environment
24-Jan	W1				Unit 3 lab		
29-Jan	M2				Unit 3 Lab		
31-Jan	W2				Unit 3 Lab		
05-Feb	M1	Camp IV	Unit 4 - descriptive statistics, central tendencies	3.1 - 3.10	Start Unit 4 Lab	Unit 3 lab due	Indigenous Services Canada - Community Well Being dataset
07-Feb	W1				Unit 4 Lab		
12-Feb	M2				Unit 4 Lab		
14-Feb	W2				Unit 4 Lab		
19-Feb	None - reading week	Camp V	NONE	Review past readings	None	None	Review material and catch up on exercises!
21-Feb	None - reading week				None	None	
26-Feb	M1	Camp VI	Unit 5: Looking for Patterns	Chapter 5	Start Unit 5 lab	Unit 4 lab due	ECCC - National Hydrological Services
28-Feb	W1				Unit 5 Lab		
04-Mar	M2				Unit 5 Lab		
06-Mar	W2				Unit 5 Lab		

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11-Mar	M1	Camp VII	Unit 6a: Looking for Relationships - Hypothesis Testing	6.1 - 6.6	Start Unit 6A lab	Unit 5 lab due	ECCC - Pollutant Inventories and Reporting Division (GHGs)
13-Mar	W1				Unit 6A lab		
18-Mar	M2				Unit 6A lab		
20-Mar	W2				Unit 6A lab		
25-Mar	M1	Camp VIII	Unit 6b: Looking for Relationships: Correlation	7.1 - 7.5	Start Unit 6B lab	Unit 6A lab due	StatsCan - Social Statistics Methods Division
27-Mar	W1				Unit 6B lab		
01-Apr	M2				Unit 6B lab		
03-Apr	W2				Unit 6B lab		
08-Apr	M1	Camp IX	Unit 7: Putting it all together		* practice exam	Unit 6B lab due	
10-Apr	W1				**		
** In final lab period	Final Exam	Summit!					

VII. Statement on Plagiarism

PLAGIARISM

The University Academic Integrity Policy defines plagiarism as “presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one’s own.” This includes reproducing or paraphrasing portions of someone else’s published or unpublished material, regardless of the source, and presenting these as one’s own without proper citation or reference to the original source. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn from include but are not limited to: books, articles, papers, literary compositions and phrases, performance compositions, chemical compounds, artworks, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, material on the internet and/or conversations.

Examples of plagiarism include, but are not limited to:

- any submission prepared in whole or in part, by someone else, including the unauthorized use of generative AI tools (e.g., ChatGPT);
- using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another’s data or research findings without appropriate acknowledgement;
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one’s own; and
- failing to acknowledge sources through the use of proper citations when using another’s work and/or failing to use quotations marks.

Plagiarism is a serious offense that cannot be resolved directly by the course’s instructor. The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of “F” for the course.

Special Note on the use of Generative Artificial Intelligence Tools (e.g. ChatGPT) in this course: You may not use Generative AI tools such as ChatGPT to create any content for assignments, labs, exercises, reports, projects etc. in this course. You may use Generative AI to summarize/explain concepts to you (e.g. “can you explain how passive and active remote sensing differ?”) or explain the general steps that would be required to solve a problem (e.g.

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“can you explain how to collect GCPs with WebODM?”) but you should not copy or paraphrase the text it produces.

ACADEMIC ACCOMMODATION

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Academic consideration for medical or other extenuating circumstances: Students must contact the instructor(s) as soon as possible, and normally no later than 24 hours after the submission deadline for course deliverables. *[Provide any additional information on your requirements for short-term informal accommodations. If you require supporting documentation for short-term considerations, you may only request the [Self-Declaration for Academic Considerations form](#). You may not request medical notes or documentation.]*

Students should also consult the [Course Outline Information on Academic Accommodations](#) for more information. Detailed information about the procedure for requesting academic consideration can be found [here](#).

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/equity/sexual-assault-support-services>

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist.

<https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>