

## Fall 2023 - Introduction to GIS - GEOG5804

Department of Geography and Environmental Studies

**Instructor:** Koreen Millard [koreenmillard@cunet.carleton.ca](mailto:koreenmillard@cunet.carleton.ca)

**Workshop Location:**

**Office Hours:** Mondays 10 - 11 am, Loeb A301D

**Course Format:** in-person

**I. Course description:** GIS for students with no previous experience. Includes data formats and structures, input/output and analysis capabilities, and GIS applications.

This is a first course in Geographic Information Systems (GIS) for graduate students who have not taken undergraduate courses in GIS but may wish to use the technology in their thesis/project work. You will use a simple-to-learn, yet powerful, GIS package (ArcGIS Pro with various extensions). Lectures will serve as an introduction to some of the concerns on the nature of geographic data, principles of GIS and map analysis. Topics will include an analysis of data in a spatial context; database structures for GIS; data query, summary and presentation; cartographic representation and creation of GIS databases for analysis. You will learn how to compile and work with spatial databases and use them in an area of spatial analysis of interest to you. You will require a Windows PC and familiarity with the Windows operating system is assumed. It is also assumed that students will be able to use word processors and other utilities (Acrobat Reader, Winzip/7Zip, Notepad, Explorer etc).

**Labs:** There are two formal “lab” assignments to be completed in this course. We will use peer-feedback for grading these assignments. Each student will submit their lab anonymously for grading to two anonymous peers. You will also grade your feedback, which will be used in the calculation of the reviewer’s lab’s grade.

**In class exercises:** Six exercises (in groups) will be take place in workshop periods, and informal discussions and presentations of results will also occur. Therefore, attendance to most workshop periods is required, with exceptions for illness and other required accommodations. Grades for in-class exercises are based on the 4 highest marks, which enables some classes to be missed if required.

**Final Project:** Students will design their own final project. It is my hope that you can use this project as a test to see if or how GIS can be useful in your thesis research. The project should be a “mini-project” (i.e. a scaled down version of the analysis you think you need in your thesis). Alternatively, the project can be unrelated to your thesis research. The final project will be carried out in an iterative manner. You will submit a proposal and receive feedback from the instructor. Based on that feedback you may need to submit a refined proposal. When your proposal is approved by the instructor, you will then carry out the analysis you proposed and submit a report.

**II. Preclusions:** none

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### III. Learning Outcomes:

- Use theoretical knowledge to undertake basic GIS analysis
- Understand and use GIS project planning methodologies
- Be able to use GIS software to create cartographic representations of spatial data

IV. Texts: none, any readings will be assigned and provided in PDF format

### V. Course calendar (**tentative: dates and topics subject to change**):

lecture date	Workshop topic	Due In Workshop / Exercise in workshop
September 12	welcome + intro to course + set up software	
September 19	Earth models, Projections and coordinate systems	
September 26	Nature of Spatial data, GIS data models (raster vs vector) - 1	
October 3	GIS data models (raster vs vector) - 2	Exercise 1: exploring vector and raster data
October 10	Introduction to cartographic design	Exercise 2: basic mapping elements
October 17	Cartography # 2	Exercise 3: advanced mapping elements
October 24	<b>Winter break - no classes</b>	
October 31	Spatial data queries, SQL, joins	<b>Lab 1: Cartography</b> Exercise 4: spatial queries
November 7	Vector GIS tools and toolboxes	Exercise 5: spatial analysis
November 14	Intro to raster analysis, georectifying data and working with imagery	Exercise 6: Exploring imagery
November 21	Work on final project	<b>Lab 2: Spatial Queries and GIS tools</b>
November 28	In class presentation of draft projects	
December 5	In class presentation of draft projects	

### VI. Evaluation:

2 labs - 30%

In-class group exercises - 15% (6 total, grade is average of 4 highest marks)

Final Project proposal - 15%

Final Project- 40% (*due last day of classes as per university regulations*)

Standing in a course is determined by the course instructor but is 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:** To enable peer feedback to be completed in a timely manner, no extensions are possible for labs, with the exception of illness. In class group exercises need to occur in the workshop period and therefore no extensions can be granted, however, the grade for these will be based only on the 3 highest marks.

## VII. Statement on Plagiarism

### **PLAGIARISM**

The University Senate defines plagiarism as “presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one’s own.”

This can include:

- 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;
- submitting a take-home examination, essay, laboratory report or other assignment written, in whole or in part, by someone else;
- using ideas or direct, verbatim quotations, or paraphrased material, concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another’s data or research findings;
- failing to acknowledge sources through the use of proper citations when using another’s works and/or failing to use quotation marks;
- handing in "substantially the same piece of work for academic credit more than once without prior written permission of the course instructor in which the submission occurs."

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.

**Use of Generative Artificial Intelligence Tools (e.g. ChatGPT):** 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 it to explain concepts to you (e.g. “can you explain how a spatial join works”) or explain the general steps that would be required to solve a problem (e.g. “can you explain what GIS tools would be required to find all fire stations within 1 km of schools”) but you should not copy the text it produces, or paraphrase the text it produces in any way, as this is considered plagiarism.

### VIII. Academic Accommodations

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

Pregnancy obligation: 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.

Religious obligation: 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.

Academic Accommodations for Students with Disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or [pmc@carleton.ca](mailto:pmc@carleton.ca) for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable). More Information: <https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodations.pdf>

#### 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>