Fall 2026 - Introduction to GIS - GEOG5804

Department of Geography and Environmental Studies
Instructor: Koreen Millard koreenmillard@cunet.carleton.ca

Workshop period: Tuesdays 11:35 - 13:35
Office Hours: by appointment (see booking calendar on Brightspace)

Brightspace link: https://brightspace.carleton.ca/d2l/home/450115

Course Format: in-person with some online components

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).

Online Courses: Through ArcGIS's learning platform, you will have access to a variety of online courses that teach conceptual GIS topics as well as "button pushing". Grading will be based on "points" associated with the course (based on the number of hours required to complete the course - see Brightspace for details). With help from the instructor, you will identify at least three of these courses that align with your goals in GIS and complete these for credit (see schedule attached). Additional courses can be taken for additional points, up to 10 extra points.

In class exercises: Three exercises (in groups) will 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 2 highest marks, which enables some classes to be missed if required. Peer feedback will be used to assign grades to these assignments, and you will get points for participating in peer feedback.

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, or as a pilot project that will be expanded in your thesis. 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

III. Learning Outcomes:

- Use theoretical knowledge to undertake basic GIS analysis
- Understand and apply 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**	**Exercise in workshop**
Sept 15	welcome + intro to course (ONLINE - see Brightspace for details)	
Sept 22	Earth models, Projections and coordinate systems	
Sept 29	Nature of Spatial data, GIS data models (raster vs vector) - 1	Exercise 1
Oct 6	Guest Lecture from ESRI Inc.	
Oct 13	GIS data models (raster vs vector) - 2 Spatial data queries, SQL, joins, basic tool box tools	Present results of Exercise 1
Oct 20	Introduction to cartographic design	Exercise 2
Oct 27	***Winter break - no classes***	
Nov 3	Cartography # 2	Exercise 2 (continued)
Nov 10	Introduction Raster Analysis and imagery	Present results of exercise 2
Nov 17	Advanced Spatial Analysis	Exercise 3
Nov 24	Work on final project	Present results of exercise 3
Dec 1	In class presentation of projects	
Dec 8	In class presentation of projects	

VI. Evaluation (out of 100):

Online ESRI Course Completion: 15 points
In Class Exercises: 15 points
Project Proposal: 20 points
Final Project Presentation: 25 points
Final Project Written Report: 25 points

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: 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. As they are points-based, no extensions can be given on the ESRI certificates. Since this is a graduate level course, I expect that the proposal and final project report are handed in on time but I do understand that sometimes we have extenuating circumstances.

VII. Generative Artificial Intelligence (AI)

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, 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"). You may also use it to check grammar or improve the clarity of sentences you have already written, provided the ideas, analysis, and structure are entirely your own. You should not use it to generate new content, or to substantively rephrase or expand your own writing, as this is considered plagiarism.

This policy exists because a core learning outcome of this course is your ability to independently plan, execute, and interpret GIS analyses — skills that are undermined if AI generates the substantive work for you. If you use AI in one of the permitted ways described above, you do not need to formally document or cite that use.

As our understanding of the uses of AI and its relationship to student work and academic integrity continues to evolve, students are required to discuss their use of AI in any circumstance not described here with the course instructor to ensure it supports the learning goals for the course.

VIII. Statement on Academic Integrity

Re-use of previous work: Carleton's Academic Integrity Policy does not prohibit students from submitting substantially the same piece of work for credit in more than one course. However, if you intend to submit work for this course that overlaps with work submitted elsewhere (e.g.,

using your final project as part of your thesis, or building on an assignment from another course), please discuss this with me in advance so we can agree on what's appropriate.

Collaboration and group work: The three in-class exercises are completed in groups, and collaboration on those is expected and encouraged, including participation in peer feedback. The final project proposal, analysis, and written report must be completed individually — you may discuss general approaches with classmates, but the analysis and writing must be your own work.

Use of Generative Artificial Intelligence tools: See Section VII above, which governs permitted and prohibited use of AI tools in this course.

Statement on 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
- failing to acknowledge sources with proper citations when using another's work and/or failing to use quotation marks.

Plagiarism is a serious offence that cannot be resolved directly by the course's instructor. The Associate Dean of the Faculty follows a rigorous process for academic integrity allegations, including reviewing documents and interviewing the student, when an instructor suspects a violation has been committed. Penalties for violations may include a final grade of "F" for the course.

IX. Statement on Student Mental Health

As a student you may experience a range of mental health challenges that significantly impact your academic success and overall well-being. If you need help, please speak to someone. There are numerous resources available both on- and off-campus to support you. For more information, please consult https://wellness.carleton.ca/

Emergency Resources (on and off campus)

- Crisis/Urgent Counselling Support: 613-520-6674 (Mon–Fri, 8:30–4:30)
- Suicide Crisis Helpline: call or text 9-8-8, 24 hours a day, 7 days a week
- For immediate danger or urgent medical support: call 9-1-1

Carleton Resources

- Mental Health and Wellbeing: https://carleton.ca/wellness/
- Health & Counselling Services: https://carleton.ca/health/
- Paul Menton Centre: https://carleton.ca/pmc/
- Academic Advising Centre (AAC): https://carleton.ca/academicadvising/
- Centre for Student Academic Support (CSAS): https://carleton.ca/csas/
- Equity & Inclusivity Communities: https://carleton.ca/equity/

Off Campus Resources

- Distress Centre of Ottawa and Region: call 613-238-3311, text 343-306-5550, or connect online at https://www.dcottawa.on.ca/
- Mental Health Crisis Service: call 613-722-6914 or toll-free 1-866-996-0991, or connect online at http://www.crisisline.ca/
- Good2Talk: call 1-866-925-5454 or connect online at https://good2talk.ca/
- The Walk-In Counselling Clinic: https://walkincounselling.com

X. Requests for Academic Accommodations

Carleton is committed to providing academic accessibility for all individuals. You may need special arrangements to meet your academic obligations during the term. The accommodation request processes, including information about the Academic Consideration Policy for Students in Medical and Other Extenuating Circumstances, are outlined on the Academic Accommodations website (students.carleton.ca/course-outline).

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 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-Accommodation.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