

**Fall 2022**  
**Advanced Topics in Geographic Information Systems**  
Department of Geography and Environmental Studies  
Carleton University  
GEOM 4008A

Instructor: Peter Pulsifer  
A327 Loeb Building, (613) 520-2600 x2571  
Email: Peter.Pulsifer@carleton.ca  
Office Hours Tuesdays 13h35-14h25 or by appointment

---

**Course calendar:** Seminars: Weekly in-person lectures and discussion

**Mondays 14:35 – 16:25, A237 Loeb**

Labs: Weekly in-person labs

**Tuesday 11:35 – 13:25, A237 Loeb**

A take-home exam will be administered at the end of the course.

**Course web site:** We will use Brightspace, plus externally-accessible materials will also be available from:

<https://brightspace.carleton.ca/d2l/home/145113>

**Course description and objectives:**

1. Explore advanced aspects of some current issues in geomatics, including:
  - a. error and uncertainty analysis and visualization/communication in spatial data and analysis;
  - b. spatial decision support systems;
  - c. spatial interpolation and field models; elevation modelling and data sources;
  - d. spatial pattern measurement or characterization;
  - e. spatial databases; and
  - f. open data, data standards and open source software development: impact and role in spatial data and analysis (standards, data exchange, open tools).

Understanding these concepts will be primarily developed using a combination of exploring the literature, class discussion, and in many cases, practical exercises. There will be presentations throughout the course to introduce and discuss topics, but there is a large component of independent learning in this class, and you will each contribute to the delivery of one of the seminars.

2. Develop skills and understanding of how your training in GIS relates to new software packages. Use this learning to provide new user documentation or tutorials to help others learn to do specific tasks in free or open-source software packages, and/or accessing, transforming and making use of open data.

**Prerequisites:** GEOM 3005 (OR equivalent alternative GIS experience), and honours standing.

Prospective students from other schools or backgrounds should contact us about other acceptable prerequisites.

## **Course Format:**

For the first time since the start of the COVID-19 pandemic, this course will be delivered in-person. Informed by last year's forced switch to online courses, we are designing this course using a blend of content and activities that worked well online last year, and a hybrid delivery model. Each week will include a combination of in-person lecture and discussion sessions and practical workshops in the campus lab. We will follow Carleton University policies and guidelines (see <https://carleton.ca/covid19/>) and will continue to monitor the COVID-19 situation.

As with many classes at Carleton this year, switching back to in-person learning will be a major transition from how courses have been run over the past two years, and there will likely be glitches to work out through the term. We also recognize that many people will be dealing with continuing, new, and elevated stresses in their personal lives during this transition. We encourage everyone to employ a combination of patience and open communication so that we can all help each other out.

## **Requirements:**

The computers in DGES GIS labs (A237 LA) will be used in this course. If you also want to work on your own computers, we can provide advice given our experience with the completely online version of this course delivered last year, and use of ones own computer will remain a backup solution should we be forced to stay away from campus for any significant portion of this course.

The exact computing requirements and recommendations will necessarily be a work in progress, since we anticipate learning new restrictions and fixes as we test the software and then bring the students in as the term begins. We will document this evolving advice at <https://carleton.ca/geography/computing-requirements-for-dges-courses/#GEOM4008>

In this class, you are expected to become familiar with GIS software you have never used before. Students are expected to already be proficient in at least one GIS package (probably ESRI ArcGIS, and for many of you, Geomatica), and able to learn new software using a good deal of independent work. Software training is not a part of this course in the fashion you are used to in other GEOM courses, however many of the tools we use will probably be new to you, and you will get help where needed.

Learning to process and analyse spatial data in a new software environment will be the focus of your final project for this course. The deliverables will include a tutorial with any required training materials, which will be published on the Internet under a Creative Commons license. The take-home final exam reports on this project.

Major topics covered in class will be accompanied by quizzes, in Brightspace, designed to make sure you grasped the main concepts in that topic. Each quiz will be done on your own time, and will be available for a period of at least 5 days. Within that window there will be a time limit, simply to make sure nobody is obsessing over a small quiz instead of working on more important things. Scheduling details will be worked out in the first weeks of class, according to the distribution of students signing up for different topics.

Late assignments will receive a penalty of ten percent of the total grade, for up to 2 days late, and after that they will not be accepted without appropriate reasons. All assignments must be produced on a computer and submitted digitally through Brightspace or the tutorial wiki site.

## **Readings:**

Journal article and other academic readings will be assigned. Students will prepare and present summaries of readings and their associated concepts in class. Readings supporting these presentations will be chosen in cooperation with the instructor.

<b>Evaluation:</b>	<b>Activity</b>	<b>Marks</b>	<b>Approximate timing<sup>1</sup></b>
	Tutorial improvement:	10%	First month of class
	Seminar:	20%	Sign up for timing within term
	Project proposal:	5%	Just before or after Reading Week
	Quizzes:	10%	Spread through term
	Project presentation:	5%	Last week of classes
	Project (includes exam):	40%	End of term
	Participation:	10%	Throughout course

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.

## **Instructional & Conduct Offences:**

Instructional offences include, among other activities, cheating, contravening examination regulations, plagiarism, submitting similar work in 2 or more courses without prior permission, and disrupting classes. Conduct offences apply in areas of discrimination and sexual harassment. Further information about University regulations which define and regulate these offences is presented in the Undergraduate Calendar: <http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/> and the university's [Academic Integrity Policy](#).

## **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;
- 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

---

<sup>1</sup> Exact timing varies each year; **detailed schedule will be developed interactively over the first few weeks**, adjusted according to numbers and interests of enrolled students. The full schedule will be worked out before course drop deadline.

- 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 offence 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.

## **Statement on Student Mental Health**

As a University 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. Here is a list that may be helpful:

**Emergency Resources (on and off campus):** <https://carleton.ca/health/emergencies-and-crisis/emergency-numbers/>

### **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: (613) 238-3311 or TEXT: 343-306-5550, <https://www.dcottawa.on.ca/>
- Mental Health Crisis Service: (613) 722-6914, 1-866-996-0991, <http://www.crisisline.ca/>
- Empower Me: 1-844-741-6389, <https://students.carleton.ca/services/empower-me-counselling-services/>
- Good2Talk: 1-866-925-5454, <https://good2talk.ca/>
- The Walk-In Counselling Clinic: <https://walkincounselling.com>

## **Statement on Pandemic Measures**

It is important to remember that COVID is still present in Ottawa. The situation can change at any time and the risks of new variants and outbreaks are very real. There are [a number of actions you can take](#) to lower your risk and the risk you pose to those around you including being vaccinated, wearing a mask, staying home when you're sick, washing your hands and maintaining proper respiratory and cough etiquette.

**Feeling sick?** Remaining vigilant and not attending work or school when sick or with symptoms is critically important. If you feel ill or exhibit COVID-19 symptoms do not come to class or campus. If you feel ill or exhibit symptoms while on campus or in class, please leave campus immediately. In all situations, you should follow Carleton's [symptom reporting protocols](#).

**Masks:** Masks are no longer mandatory in university buildings and facilities. However, we continue to recommend masking when indoors, particularly if physical distancing cannot be maintained. We are aware that personal preferences regarding optional mask use will vary greatly, and we ask that we all show consideration and care for each other during this transition.

**Vaccines:** While proof of vaccination is no longer required to access campus or participate in in-person Carleton activities, it may become necessary for the University to bring back proof of vaccination requirements on short notice if the situation and public health advice changes. Students are strongly encouraged to get a full course of vaccination, including booster doses as soon as they are eligible and submit their booster dose information in [cuScreen](#) as soon as possible. Please note that Carleton cannot guarantee that it will be able to offer virtual or hybrid learning options for those who are unable to attend the campus.

All members of the Carleton community are required to follow requirements and guidelines regarding health and safety which may change from time to time. For the most recent information about Carleton's COVID-19 response and health and safety requirements please see the [University's COVID-19 website](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact [covidinfo@carleton.ca](mailto:covidinfo@carleton.ca).

### **Academic Accommodation:**

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. For accommodation regarding a formally-scheduled final exam, you must complete the Pregnancy Accommodation Form ([click here](#)).

**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. For more details [click here](#).

**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).

### **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 will 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>