# GEOM 4008 - Advanced Topics in Geographic Information Systems

Course outline - Fall 2021 Department of Geography and Environmental Studies Carleton University

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Office Hours Tuesdays 13h00-14h00 Office Hours TBD

(use link in Brightspace)

Course calendar<sup>1</sup>: Seminars: Weekly online content modules available each Wednesday by

Scheduled class time (11h35),

Plus online synchronous sessions scattered through the term

Wednesdays 11h35-13h25

(Connect from Brightspace, or use this link:

https://bit.ly/2YEyVHX)

Labs: Two-hours Thursdays 11h35-13h25 in Loeb A200 (and A237 if

needed)

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 http://dges.carleton.ca/courses/GEOM4008

# Course 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. 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.

Marking:	Activity	Marks	Approximate timing <sup>1</sup>
	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

#### **Course Format:**

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 variable combination of asynchronous components (pre-recorded material), synchronous online sessions (Wednesdays 11h35-13h25) for full group participation, and practical workshops in the campus labs.

As with many classes at Carleton this year, switching back to some activities on campus with some staying online will be another big transition from how the course has been run in the past, 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 while coping with the pandemic and associated public health measures. We encourage everyone to employ a combination of patience and open communication so that we can all help each other out. Please do not hesitate to contact the instructors if anything is preventing you from participating properly in the course as we have designed it. There are many things we can't control, but we will make modifications wherever possible.

Please also recognize that the switch to online learning creates potential privacy problems that we never had to worry about in the past. When we do synchronous video calls and we have cameras on, we are opening windows into our homes. Please respect that fact with all your fellow students and instructors. Do not record people without their permission, and do not distribute recordings that we make available to anyone outside of the course. Remember, the materials we post are not just the course materials anymore, now they will include recordings of what was said and seen and shown by all your classmates. If you have any concerns about privacy, don't hesitate to bring them up with us.

Due to the practical nature of much of what we will cover, it will be very difficult or impossible to successfully participate completely asynchronously in this course. At the same time we recognize there will be challenges and will work with you to provide flexibility. Some of this will likely involve the recording of synchronous sessions. We ask all students to provide permission for these recordings, under the conditions

<sup>&</sup>lt;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.

outlined above, i.e. that the recordings only be used for the purposes of reviewing or getting caught up while taking this class.

# Requirements:

The computers in DGES GIS labs will be used in this course as long as public health restrictions allow this. If you 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-dgescourses/#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 cuLearn, 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.

#### **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: <a href="http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/">http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/</a> and the university's <a href="https://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/">https://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/</a> and the university's

Plagiarism is a serious offence and will not be tolerated. Plagiarism is the submission of someone else's writing/ideas/work as your own. All ideas presented which are not your own must be properly referenced. All plagiarism offences result in mandatory reporting to the Dean's office. You will often be working collaboratively to prepare for an assignment and possibly to collect data, but unless you receive specific

written instructions to do otherwise, ALWAYS write your assignments and tests individually. Never include others' writing or other materials into your work without proper attribution. Including your own work from previous assignments or other courses, without proper attribution and permission from the instructors, is also prohibited in this course.

## 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.

## **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 us 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 <u>Pregnancy Accommodation Form</u>.

**Religious obligation**: write to us 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 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 inclass 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: <a href="https://carleton.ca/equity/sexual-assault-support-services">https://carleton.ca/equity/sexual-assault-support-services</a>

### **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 us 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. <a href="https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf">https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf</a>