GEOM 4008 – Advanced Topics in Geographic Information Systems
Course outline - Fall 2020
Department of Geography and Environmental Studies
Carleton University

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Office Hours Thursdays 11:00-12:00    Office Hours TBD
(use link in cuLearn)

Course calendar:
Seminars: Weekly online content modules available each Tuesday by 11:30
Labs: Two-hour workshop Tuesdays 14:35-16:25 by Zoom
(Connect from cuLearn, or use this link: https://bit.ly/2YEyVHX)

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

Course web site: We will use CULearn, 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:

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

Due to the switch to all-online courses, this course is designed using a blend of content and activities that worked well in previous years and a hybrid online delivery model. Each week will include an asynchronous component (pre-recorded material) and a synchronous session (Tuesdays 14:35-16:25) for full group participation. The synchronous session will usually be used for practical lab sessions, but the distinction between lab and seminar slots will be somewhat fluid, since there will also be student presentations to accommodate.

As with most classes at Carleton this year, this will be a big transition from how the course has been run in the past, and there will likely be glitches to work out through the term. At the same time, many people are dealing with 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 sudden 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, it's not just the course materials any more, now it is also recordings of what was said and seen and shown by all of your classmates. If you have any concerns about privacy, don’t hesitate to bring them up with us.

Some of you have already made us aware of potential problems with uniformly participating in the synchronous portions of this course. 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 outlined above, i.e. that the recordings only be used for the purposes of reviewing or getting caught up while taking this class.

Requirements:

Students are generally expected to provide their own computer for the practical work in this class. We will provide a virtual machine image with software preconfigured for the practical workshops in the course. This environment can also be used for your term project, although that is not required.

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1 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.
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 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 cuLearn 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: http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/

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, is also considered plagiarism.

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:

Carleton provides [academic accommodation to students](#) for reasons of disability, religious observance, pregnancy and/or parental leave, sexual violence, and student activities.

Providing accommodations simply means providing alternatives to students who cannot perform the essential requirements of their academic programs due to the reasons mentioned above. At no time does academic accommodation undermine or compromise the learning objectives that are established by the academic authorities of the university.

This page provides only a brief overview of the accommodations policy and process. Please contact [Equity and Inclusive Communities](#) for a full explanation.

Religious Observation

A request should be made in the first two weeks of the academic term, or as soon as possible where the scheduling of an event or activity conflicting with a religious obligation does not appear in the course outline or calendar.

A list of multi-faith holy days is accessible through the [Equity Services website](#). Instructors can also contact Equity Services to confirm the eligibility of a religious event or practice.

Pregnancy and/or Parental Leave

Requests for parental leave must be made in writing to the Registrar’s Office, or in the case of graduate students, to the Office of the Dean of Graduate and Postdoctoral Affairs.

A student who is pregnant may request a temporary modification to her program (e.g., laboratory or field work). The student should meet with the instructor(s). The department chair/director and the faculty dean can assist in the discussion. An Equity Services advisor can also be consulted if a student has questions about pregnancy and/or parental leave.

Students with Disabilities

Carleton is strongly committed to providing access and accommodation for all individuals with identified and duly assessed disabilities. The university has a [Senate-approved policy on academic accommodation](#) that forms part of its human rights policy. The policy promotes efforts to accommodate students with disabilities so that they will have the opportunity to meet learning outcomes and be fairly evaluated in their performance. In no case, however, does academic accommodation negotiate away, lower, or remove the academic standards and learning outcomes of any course or program, rule, regulation, or policy at the university.

Some students with disabilities may require special accommodations for tests and exams. In these cases, students must present you with a signed accommodation form from the Paul Menton Centre detailing their accommodation needs well in advance of the date of an exam. A copy of the [Paul Menton Centre accommodations policy 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 carleton.ca/sexual-violence-support.

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. Please contact your instructor 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, see the policy.