GEOM 4008 – Advanced Topics in Geographic Information Systems
Course outline - Fall 2019
Department of Geography and Environmental Studies
Carleton University

Instructor: Scott Mitchell, B350A Loeb Building Phone: 613-520-2561
Email: Scott.Mitchell@carleton.ca
Office Hours: USUALLY Tuesdays 1:30, or by drop-in/appointment

Course calendar:

- Labs: Two-hour workshop Tuesdays 15:35-17:25 LA A237

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 in spatial data and analysis,
   b. decision support systems,
   c. elevation modelling (data sources + interpolation algorithms),
   d. spatial pattern measurement or characterization, and
   e. open data, data standards and open source software development: impact and role in spatial data and analysis (standards, distributed databases, 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 me 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>
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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.
Requirements:

In this class, you are expected to become familiar with GIS software you have never used before. We will use the GIS lab in Loeb A237, where installed software includes ArcGIS, PCI Geomatica, TerrSet, QGIS, GRASS, etc., on a Windows or Linux platform. Use of other software may be possible. Students are expected to already be proficient in at least one GIS package (I assume 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 I recognize that 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 and verifiable documentation. 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.

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.

I have copies of several other useful textbooks available for borrowing, and the library has useful resources which I can direct you towards, depending on the topics you choose to explore.

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. For more details 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.

Accommodation for Student Activities: write to the professor 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 Accommodation for Student Activities.

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).

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