Geospatial Analysis
GEOM 3005

Academic year: Fall 2017. Any changes or corrections will be posted on cuLearn on the first day of classes each term.

Course title: Geospatial Analysis (GEOM3005)
Department: Department of Geography and Environmental Studies
Faculty of Arts and Social Sciences, Faculty of Science

Instructor: Dan Patterson
Building: B450B Loeb Building
Website: http://www.carleton.ca/geography/people/patterson-dan/
Email: Dan.Patterson@carleton.ca
Phone: My cell number will be provided in class, for text messaging.
Office: To be determined in the first week of each term and posted in cuLearn.

Course Description

Calendar description
Acquisition, manipulation, and display of spatially referenced information using Geographic Information Systems (GIS). Spatial modeling, site selection and routing analysis in raster and vector GIS.

Prerequisite: GEOM 2007
Workshop three hours a week

Other information
The course is delivered as a 3 hour workshop which will entail both lecture and practical demonstrations. ArcGIS and a variety of extensions will be used in this course. Students learn a variety of data creation, handling and processing techniques as well as methods of data analysis (point-based, neighborhood-based, overlay mapping, etc) for both raster and vector data sets.

Texts
All documentation and course materials will be provided as portable document (*.pdf) files. There are no definitive texts which will suit all purposes. Readings are taken from a variety of sources, any GIS-related texts is useful. I maintained a collection which students may borrow overnight or over the weekend.
Evaluation

Faculty grading policy:
“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.”

The evaluation in this course will be based upon your performance in the following:

- Attendance 5%
- Esri campus course 5%
- Lab assignments 40%
- Lab test 25%
- Individual Project 25%

Attendance
You are either here for the workshop, or you are not. Think of this as 0.5% per week with a discretionary absence of 2 weeks. I will not entertain any deviations from this, so plan accordingly in the case of inclement weather or other misadventures.

Virtual Campus Courses
These provide the student the chance to get ahead or review foundational materials. The courses are online and can be completed within the first 3 weeks of class. See the following links
  - Virtual campus courses
  - Course listings

Specific details will be discussed in class.

The courses that you can take are:

1. Getting Started with ArcMap (3 hours)
2. Getting Started with GIS (3.5 hours)
3. Editing in ArcGIS Desktop (3 hours)
4. Getting Started with ArcGIS Pro (2.5 hours)

Lab Assignments
Four lab assignments will be assigned. The content may vary by year depending upon the student complement enrolled. Due dates will be indicated in class but you generally have 2 weeks to submit.

Lab Test
There will be a lab test which involves a strong practical component. Some questions will be given out ahead of time.

Individual Project
This project will address an analysis issue within GIS. The project may be essay-based or incorporate a practical demonstration of an analysis issue (with appropriate documentation).

Late policy:
There are no late assignments unless accompanied by a medical certificate covering you for
the period from assignment issue date to assignment due date. For non-medical issues, contact me directly and as soon as possible. Otherwise, hand in what you have completed by the due date.

General Comments
This course will, at times, require many extra hours of your time outside the workshop period. You must learn to budget your time accordingly. As you will note, there are no extensions (medical notes and bereavement excepted) for any assignments. The reasons for this are simple: you will get behind and you will get frustrated. There are many excuses, but only one solution: do your work and do it early. It is strongly recommended that you spend the first six or so weeks of the course immersing yourself in the technical aspects being introduced. Experience with many students in the past has shown that there is a self-inflicted direct correlation between effort spent during this period and the ease at which they grasp materials in the latter stages of the course.

General University Rules and Regulations

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 more details see the Student Guide

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 see the Student Guide

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).
## ASSISTANCE FOR STUDENTS

<table>
<thead>
<tr>
<th>IF A STUDENT NEEDS ASSISTANCE WITH…</th>
<th>REFER TO…</th>
<th>CONTACT INFORMATION</th>
</tr>
</thead>
</table>
| ...understanding academic rules and regulations...choosing or changing their major...academic planning guided by an Academic Advisor...polishing study skills | **Student Academic Success Centre (SASC)**  
"Helping students build a foundation for academic success by facilitating services that foster personal direction and academic competence" | 302 Tory Building  
613-520-7850  
http://www2.carleton.ca/sasc/  
No appointment necessary as all students are seen on a walk-in basis. |
| ...developing a coherent pattern of courses in the major and consultation about opportunities for graduate and professional study | **Undergraduate Program Advisors** | Consult the individual departmental website |
| …a learning disability | **Paul Menton Centre**  
"Integration, Individualization, Independence" | 500 University Centre  
613-520-6608  
http://www2.carleton.ca/pmc/  
Students can call or drop in to make an appointment |
| …developing writing skills | **Writing Tutorial Service** | 4th Floor, Library  
613-520-6632  
http://www2.carleton.ca/sasc/writing-tutorial-service/ |
| …peer assisted tutoring for pre-identified, notoriously difficult courses | **Peer Assisted Study Sessions**  
"PASS workshops integrate how-to-learn (study skills) with what-to-learn (course content) in a fun, relaxed environment." | Learning Support Services  
http://www2.carleton.ca/sasc/peer-assisted-study-sessions/ |
| …polishing English conversation skills, or proof reading  
(International students only) | **International Student Services Office** | 128 University Centre  
613-520-6600  
http://www1.carleton.ca/issso/ |
| …Library and Research help: Learning Support and IT support | Staff at **MacOdrum Library**  
(reference services desk) | http://www.library.carleton.ca/  
613-520-2735 |
| …coping with stress or crisis | **Office of Student Affairs or Health and Counseling Services** | Either ext. 2573 or  
http://www.carleton.ca/studentaffairs  
or www.carleton.ca/health |
# Schedule

Readings from course notes: **Geospatial analysis and applications of GIS**

The official version shall include any corrections noted in cuLearn.

<table>
<thead>
<tr>
<th>Workshop (Week) Monday date</th>
<th>Workshop materials</th>
<th>Readings</th>
</tr>
</thead>
</table>
| (1) Sept 4-                  | ArcMap and ArcGIS Pro  
Introduction to the course. Organizational details. Review of previous materials and introduction of new software. | GIS a Primer and Chapter 1 |
| (2) Sept 11-                 | Working with Raster Data  
| (3) Sept 18-                 | Basic Grid operations  
Operations involving a single grid and 2 or more grids. | Chapter 3 Processing grids |
| (4) Sept 25-                 | Query, Summary and Reclassification of Grid Data  
Including spatial cleanup and condition checking. | Chapter 4 Modeling in GIS |
| (5) Oct 2-                   | Analysis involving distance and area  
Cost path analysis, spatial allocation | Chapter 5 Grid-based distance operations |
| (6) Oct 9 Thanksgiving 9th   | GIS conference at U of T | |
| (7) Oct 16-                  | Working with digital elevation data  
Slope and aspect determination. Interpolation and contouring. | Project Proposals due  
Chapter 6 & 7 |
| (8) Oct 23-                  | **** Reading Week **** | No class |
| (9) Oct 30-                  | Hydrologic Modeling  
Basin delineation etc. | |
| (10) Nov 6-                  | Visibility analysis and visualization  
3D analyst extension, 3D surfaces, TINs | |
| (11) Nov 13-                 | Network analysis  
Network analyst extension for routing and allocation problems | Chapter 8 |
| (12) Nov 20-                 | **** Lab test **** | as assigned |
| (13) Nov 27-                 | Special topics  
special topics will be addressed in the last few weeks. | |
| Dec 4-8 Last week of classes | Final Projects Due **** Friday Dec 8th by 10:00 am **** | |