

DRAFT VERSION ONLY
Geographic Information Systems
GEOG 5804

Academic year: GEOG 5804: Fall 2016 GEOG 5804: Winter 2017.
Any changes or corrections will be posted on cuLearn on the first day of classes each term.

Course title: Geographic Information Systems (GEOG5804)

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

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

GIS for students with no previous experience. Includes data formats and structures, input/output and analysis capabilities, and GIS applications.

Other information

This is a first course in Geographic Information Systems (GIS) for graduate students who have not taken undergraduate courses in GIS but may wish to use the technology in their thesis work. The student will use a simple-to-learn, yet powerful, raster/vector-based GIS package (ArcGIS with various extensions) . The lectures serve as an introduction to some of the concerns on the nature of geographic data, principles of GIS and map analysis. Topics will include an analysis of data in a spatial context; database structures for GIS; data query, summary and presentation; cartographic representation and creation of GIS databases for analysis. The student will learn how to compile and work with spatial databases and use them in an area of spatial analysis of interest to them.

The course will be delivered as a 3 hour workshop. The course will be very hands-on and a certain degree of familiarity with Windows operating system is assumed. Students should be able to use a wordprocessor, text editor, various operating system applications and others as needed. Students deficient in these areas will be expected to gain confidence in using these applications on their own.

Texts

The text is **GIS: A Primer** which is available in portable document format (PDF). This requires access to Acrobat Reader which can be obtained from <http://www.adobe.com>.

There is a myriad of materials on GIS in the library on the main shelves and in the MADGIC section on the main floor which the student is expected to consult. I also maintain a library of GIS and related texts which students are free to borrow.

Special Note

Students who are not fully comfortable working with computers will have difficulty in the early stages of the course. Casual use of wordprocessors or the internet does not constitute an adequate background. The course runs 1 day a week for 12 weeks, you will probably require an additional 4-6 hours a week on average to complete assignments. The final project commands between 25 to 50 hours of work based upon prior student efforts. Allocate time accordingly.

Evaluation and due dates

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."

Course grade:

Attendance	5%
Esri campus course	5%
Laboratory assignments	30% (3 assignments, 10% each)
Laboratory test	30%
Final Project	30%

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

This provides the student the chance to select a topic that may be of interest to them that aren't expressly covered in the course, or to examine a topic in more detail. The courses are online and can be completed within the first 3 weeks of class. See the following links

[Virtual campus courses](#) and [Course listings](#)

Specific details will be discussed in class.

Test

There will be one test which deals with the practical aspects of GIS (30% of final grade).

Some of the test questions may be given to ahead of time to give you a chance to think about how you would answer the questions. You will actually answer the questions during the workshop period (see the schedule).

Lab Assignments

There will be a three lab assignments and on-line questions that need to be answered, due dates are noted in the schedule. (30% of final grade).

Learning Module

You are required to produce a Learning Module (30% of final grade). There will be a written submission and you will present your results/findings/demonstration during a 10 minute presentation towards the end of term.

The purpose of the Learning Module is for you to examine, in detail, one of the extensions and/or scripts that can be used with ArcGIS. The learning unit should clearly demonstrate the requirements and application to solving a geographic problem.

The learning module can be analysis-based, for example:

An analysis of interpolation methods: comparison of several interpolation techniques.

An analysis of Watershed X's hydrologic properties.

An attempt to optimize bus routing.

An exploration of the affect of scale on Moran's I statistic.

An spatial analysis of point/line/areal pattern X in location Y.

Routing algorithms and their implementation in GIS.

Tools and techniques for point pattern analysis.

Your far superior suggestion goes here...

This provides you with the opportunity to link GIS with your own areas of interest or research. Students are encouraged to discuss their module in advance. Due dates are listed in the attached schedule.

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 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

IF A STUDENT NEEDS ASSISTANCE WITH...	REFER TO...	CONTACT INFORMATION
...understanding academic rules and regulations ...choosing or changing their major ...finding a tutor ...academic planning guided by an Academic Advisor ...polishing study skills	Student Academic Success Centre (SASC) <i>"Helping students build a foundation for academic success by facilitating services that foster personal direction and academic competence"</i>	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 <i>"Integration, Individualization, Independence"</i>	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 <i>"PASS workshops integrate how-to-learn (study skills) with what-to-learn (course content) in a fun, relaxed environment."</i>	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/isso/
...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

Workshop	Topic	Assignments/tests/etc
1 Sept 12-16	An Introduction to GIS	
2 Sept 19-23	Geographic Data and GIS	Lab 1 start
3 Sept 26-30	Tabular Data, Spatial and Attribute Query	
4 Oct 3-7	Scripts, Tools and extensions	Lab 1 due, Lab 2 start
5 Oct 10-14 Oct 10 Thanksgiving	Creating Tabular Data	
6 Oct 17-21	Creating Feature Classes	Lab 2 due, Lab 3 start, MADGIC tour
7 Oct 17-21	continued	Module Proposals due
8 Oct 24-28	Winter Break	
9 Oct 31- Nov 4	Spatial Analyst Extension	Lab 3 due
10 Nov 7-11	Network Analyst Extension	
11 Nov 14-18		Lab Test
12 Nov 21-25	Customizing ArcGIS Working with GPS Data	
13 Nov 28- Dec 2	Selected topics and/or project work	
Dec 5-9 Last week of classes	Final Projects Due Dec 9 th by 10:00 am	

Schedule

Workshop	Topic	Assignments/tests/etc
1 Jan 9-13	An Introduction to GIS	
2 Jan 16-20	Geographic Data and GIS	Lab 1 start
3 Jan 23-27	Tabular Data, Spatial and Attribute Query	
4 Jan 30- Feb 3	Scripts, Tools and extensions	Lab 1 due, Lab 2 start
5 Feb 6-10	Creating Tabular Data	
6 Feb 13-17	Creating Feature Classes	Lab 2 due, Lab 3 start, MADGIC tour
7 Feb 20-24 Feb 20 Holiday	Winter Break	
8 Feb 27- Mar 3	continued	Module Proposals due
9 Mar 6-10	Spatial Analyst Extension	Lab 3 due
10 Mar 13-17	Network Analyst Extension	
11 Mar 20-24		Lab Test
12 Mar 27-31	Customizing ArcGIS Working with GPS Data	
13 Apr 3-7	Selected topics and/or project work Final Projects Due Friday April 7 th , by 10:00 am	