

Department of Geography and Planning
University of Toronto
GGR373: ADVANCED GEOGRAPHIC INFORMATION SYSTEMS
COURSE OUTLINE
Fall 2015

Instructor: Kristian Larsen
Office: Sidney Smith 5061
Office Hours: Tuesday: 11:30am – 1:00pm
Email: kristian.larsen@utoronto.ca (will usually answer within 24 hours)

PREREQUISITE
GGR273

COURSE DESCRIPTION

Over the past years, researchers and professionals have increasingly turned to GIS for acquiring, processing, analyzing and mapping environmental and socio-economic data. This course covers advanced topics in understanding and using GIS. The lectures will cover the fundamental theory of GIS, and will discuss examples of how it is implemented in GIS software. Much of the course will also deal with advanced GIS methods for problem solving. Students will learn and complete case studies that are not only relevant to Geography, but also Public Health, Transportation Planning and other disciplines. Tutorial sessions will give the students an opportunity to learn and practice GIS through practical assignments. They will learn how to use global position systems, create three-dimensional surfaces, and perform advanced spatial analysis. Students will also learn how to use Network Analyst among other extensions.

LEARNING OBJECTIVES

- Develop a greater understanding of GIS
- Use GPS to create their own GIS data
- Create a 3-D surface
- Develop an understanding of the GIS extensions
- Learn about advanced spatial analysis
- Use and understand Network Analyst

LECTURES

Tuesday 1:00-3:00, Location: Sidney Smith 2125.

READINGS

Required text: Chang, Kang-tsung. 2013. Introduction to Geographic Information Systems, 7th Edition. Toronto: McGraw-Hill.

Note: The most recent and earlier edition of the text will suffice, but you will then be responsible for any content that may have changed.

Additional assigned readings will be posted on blackboard.

COURSE WEBSITE

<http://portal.utoronto.ca>

Log in using your UTORid and password. The course will be listed under the My Courses module, along with the link to all your other Blackboard-based courses. All assignments will be submitted via blackboard. The timestamp for submission will be used to determine whether the assignment is late.

LABS

All labs are held in Sidney Smith Hall room 620 (Level "G", one floor below street level). Lab sessions are held every week. The labs are conducted by teaching assistants (TA's) who are there to introduce assignments and answer questions. Their role is to help you and make suggestions but not do the work for you. In order to learn the concepts and software you must be prepared to try things on your own. The TA's will deny you the chance to learn for yourself and will not give you the answer. Make sure you attend all of the lab sessions, as this is often where you will get valuable software tips and other help. Labs are not mandatory, but you are responsible for the material covered by the TA. Not completing the assignments as the TA instructs may cause a loss of marks. If you wish to switch to a different lab section, go to the desired section and ask the TA for permission, or email your TA for permission. Students will attend one of the following lab sessions:

Tuesday: 3pm-5pm

Wednesday: 1pm-3pm

TA INFO

Ting Zheng: zhengt@geog.utoronto.ca

EVALUATION

Laboratory Assignments: 55%

Lab 1: (10%)

Lab 2: (15%)

Lab 3: (15%)

Lab 4: (15%)

Midterm Examination: 15% (you are responsible for all material taught up to the date of the test)

Final Examination (during exam schedule): 30% (cumulative)

LATE PENALTIES

Late submission of assignments will result in a deduction of 10% per calendar day (weekends included) for a maximum of 7 days. Labs handed in after the beginning of a lab period will be penalized for the day. If an assignment has been marked and handed back to the class, no other assignments will be accepted (even if it has not been 7 days). No re-writes will be provided if you miss the midterm test, if proper documentation is provided the marks will be redistributed to your final exam.

IN CASE OF ILLNESS

Requests for deadline extensions must be made to the instructor within 5 business days after the deadline, and must be accompanied by an original copy of the official university medical form. Medical forms are accepted at the discretion of the instructor. U of T medical certificate is available online: <http://www.illnessverification.utoronto.ca/>

ACCESSIBILITY NEEDS

The University of Toronto is committed to accessibility. If you require accommodations or have any accessibility concerns, please visit <http://studentlife.utoronto.ca/accessibility> as soon as possible. Please follow up with the professor in private to ensure your needs are met. For other needs (i.e. Religious, Illness, etc.) please see the professor in private before the assignment or exam due date.

ACADEMIC INTEGRITY

All students are reminded of the seriousness of academic dishonesty of any form, particularly plagiarism. Plagiarism and other academic offences including false or altered medical forms, death

certificates, or similar documents will not be tolerated. Students should also ensure they are submitting their own work and not that of others. Plagiarism is an academic offense at the University of Toronto. Plagiarism is quoting (or paraphrasing) the work of an author (including the work of fellow students) without proper use of citation. Quotation marks are required when using an author's words. Students also should not be submitting any academic work for which credit has previously been obtained or is being sought, without first discussing with the instructor. For more information, please refer to the universities Code of Behaviour on Academic Matters.

TECHNICAL PROBLEMS

This course uses computers, and there are many things can go wrong when using them. You are responsible for ensuring that you maintain regular backup copies of your files and schedule enough time when completing an assignment to allow for delays due to technical difficulties. Computer viruses, crashed hard drives, broken printers, lost or corrupted files, incompatible file formats, and similar mishaps are common issues when using technology, and are not acceptable grounds for an extension.

REMARKING REQUESTS

First consult the TA to re-review your lab mark. If the TA is unable to assist then set up a meeting with the instructor. This must be completed within two weeks of returning the assignment. The same policy applies for the midterm test.

GEOGRAPHY MATH HELP CENTRE

Another resource for this course is the department's new Math Help Centre. Geography TAs will be available to help refresh and explain mathematical concepts and techniques that may come up in your GGR courses. This includes working with formulas, graphing data, completing calculations, and so forth. It does not matter how basic your questions are! No appointment is required, just drop by. There will also be table space available in the room, allowing students to get math help as they work through assignments. Details on location and TA times posted here:
<http://geography.utoronto.ca/undergraduate/math-help/>

COURSE TOPICS

Week	Date	Lecture	Tutorial		
			Reading	Assigned	Due
1	Sept. 15	Course Introduction About the class and instructor	No readings	No labs	
2	Sept. 22	Global Positioning Systems Creating data with GPS	Chapter 5	Lab 1	
3	Sept. 29	Review Raster Data Raster data structure and analysis	Chapter 4 Chapter 12		
4	Oct. 6	Using Python for Raster Data Analysis Perform analysis	Assigned readings	Lab 2	Lab 1
5	Oct. 13	Terrain Mapping and Analysis Exploring 3-D data	Chapter 13		
6	Oct. 20	Viewshed and Watershed Analysis Applications and factors	Chapter 14	No labs*	Lab 2
7	Oct. 27	Midterm test	No readings	Lab 3	
8	Nov. 3	Network Analyst 1 Building a network dataset	Chapter 17		
	Nov. 10	NO CLASS FALL BREAK		No Labs	
9	Nov. 17	Network Analyst 2 Shortest path analysis	Assigned readings	Lab 4	Lab 3
10	Nov. 24	Guest lecture Cameron Plouffe: ESRI Canada	Assigned readings		
11	Dec. 1	Spatial Interpolation Data acquisition, relational database and queries	Chapter 15		Lab 4
12	Dec. 8	Course review		No labs	

Note:

1. All labs will be assigned during the lectures. Each assignment will be digitally available through the course website (blackboard) on the day of that week's lecture. No paper copies will be handed out.
2. The assignments are due at the beginning of the lab session, except for Lab 4 which is due at the end of the lab section.
3. The instructor may change the topic and content of the lectures at a later time.

*No lab sessions are being run the week before your mid-term exam, but lab 2 still should be submitted on blackboard prior to the start of your lab time that week. The lab will still be open and you will have priority for computers during your lab session should you wish to work during your regular lab time, but the TA will not attend.