

JPG1906: Geographic Information Systems

Mondays, 1-3pm

Online

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Office Hours: Wednesday 12pm-1pm or by appointment

Course Description

This course is an introduction to digital mapping and spatial analysis using a geographic information system (GIS), and is designed for graduate students from a variety of disciplines and with no previous GIS experience. You will learn how to create your own maps and how to use a GIS to analyze geographic problems using methods that can be applied to a wide range of subject areas. Over the term, you will have opportunities to find and work with data sets related to your own research interests, and complete a final project that demonstrates your new GIS knowledge and skills in a story map, which is a web page that combines text, images, audio, video, and maps. After completing the course, successful students will be able to learn new functions on their own and apply what they have learned to their own research.

Learning Outcomes

- Develop an understanding of GIS and its application in the fields of natural and social sciences.
- Acquire hands-on experience with using ArcGIS, the most popular GIS software.
- Learn how to communicate geographical information using maps.
- Develop an understanding of the GIS data structure.
- Begin to understand the methods of spatial analysis using GIS.
- Learn basic cartography and map making.

Course Organization

Prerequisite

There are no prerequisites for this course. Students will need their own computer which is able to run ArcGIS. A familiarity with computers and the Microsoft Windows operating system is required. A general understanding of geography is helpful, but no prior geography courses are required.

Class Format

This is an online course. Synchronous lectures will be given from 1pm-3pm on Monday, students will have the opportunity for synchronous online discussion and questions during class times. These lectures will be recorded and posted online for future viewing. There will also be synchronous online lab sessions from 3pm-5pm on Monday, which are optional but provide an excellent opportunity for student to obtain help from the teaching assistant.

Software

The course uses ArcGIS software from Esri Inc., the most popular GIS software and an industry standard in many fields. Students need to obtain a student copy of ArcGIS from the map and data library for their own PC. Mac users can install Bootcamp to install ArcGIS or can use citrix. Citrix will work to complete the work but it can be quite slow at peak times. You need to be able to work with ArcGIS on your own computer to complete this course as no lab computers will be available on campus.

Install ArcGIS on your own computer

PC: Students can download and install a free, one-year student edition of ArcGIS on a Windows computer. All of the assignments and data will be available online. You can download the software from the University of Toronto Map and Data Library and if you need installation assistance, contact gis.maps@utoronto.ca.

Fill the form to [request a license](#) first.

Follow the [installation tutorial](#) after obtaining a license.

Mac: ArcGIS is Windows-only but can be installed on a Mac using a free utility called Boot Camp that comes with OS X and later (but you will need a valid copy of Windows). For information on [Boot Camp](#).

PC or Mac no local install

Citrix: Instructions on installing citrix are available on quercus.

Remote access to lab computers: The department labs and lab 561 at St. George Campus will be available for students those who have registered for courses offered by Department of Geography and Planning. Details are available on quercus.

Please note, you are responsible to ensure you have a working version of ArcGIS on your own computer. The map and data library staff, instructor and TA's are willing to help, but many of us do not work on Mac computers.

Online Lectures and labs– via Blackboard Collaborate

Monday : 1pm-3pm

Monday: 3pm-5pm (online labs)

Course Website

Quercus: q.utoronto.ca

Log in using your UTORid and password.

All assignments and course material will be posted and submitted via quercus.

Online submissions for term work

It is every student's responsibility to ensure that their online submission is submitted successfully by the due date. Accommodations will not be made for unsuccessful submissions due to, but not limited to, i) the system timing out ii) submitting the incorrect document(s) iii) poor internet connection / no internet connection / hydro outage etc.

Technical problems

This course uses computers, and there are many things that 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.

A note on marking

There is a teaching assistant in this course, which is unusual at the graduate level. However, this is usually a large class and is a methods-oriented course with a number of assignments that have substantial technical requirements and an emphasis on software skills and techniques. The TA provides valuable course support and, while they will contribute their feedback, all of your marks are the responsibility of the instructor.

Assignments and Evaluation

Assignment 1 – Lab 1

October 5 - 15%

Introduction to ArcGIS - learning the software and basic map making

Assignment 2 – Lab 2

October 26 - 20%

Coordinate systems and map projections

Assignment 3 – Lab 3

November 9 - 20%

Digitizing, geodatabases and quantitative mapping

Assignment 4 – Lab 4

November 30 - 20%

GIS analysis

Assignment 5 – Story Map Project

December 14 - 25%

The primary objective of the project is for you to demonstrate what you have learned in terms of GIS knowledge and skills. The secondary objective is to do this in a way that relates to a specific topic of your choosing. This could be something hypothetical, but more marks will be given for projects that are more realistic, since this is meant to be a way for you to explore how GIS might be used in your research. Ideally, you will use the assignments as a way to explore possible themes and data sets that could be reworked and combined as part of your final project. Since story maps are a web-based framework for structuring a narrative around content in a variety of formats, it's a great platform for being creative. You can see some inspiring examples of what is possible [here](#). Your story map could form part of a digital portfolio that you can share with colleagues and potential employers. The project has two parts: an Esri story map (15%), and a project report (10%).

Late Penalties

Late submission of assignments will result in a deduction of 10% per calendar day (weekends included) for a maximum of 7 days. 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).

Required Text

Chang, Kang-tsung. 2018. Introduction to Geographic Information Systems, 9th Edition. Toronto: McGraw-Hill.

You can use the paper or online version of the text. Online version can be purchased [here](#).

Course Schedule

Week 1 – September 14

Introduction: What is GIS?

Reading: No reading

Week 2 – September 21

Intro to ArcGIS: Basic map design

Reading: Chapter 1

Week 3 - September 28

Coordinate systems: The shape of the earth and map projections

Readings: Chapter 2

Week 4 - October 5

Mapping and GIS data 1: Vector data model

Readings: Chapter 3

October 12 - no class - Thanksgiving

Week 5 - October 19

Mapping and GIS data 2: Raster data model

Readings: Chapter 4

Week 6 - October 26

Creating a digital world: Digitization and spatial data editing

Readings: Chapter 5

Week 7 - November 2

Data accuracy and quality: Steps to using “good” data

Readings: Chapter 7

Week 8 - November 9

Mapping quantitative data: Displaying data

Readings: Chapter 9

Week 9 - November 16

Data exploration: Data acquisition and queries

Readings: Chapter 10

Week 10 - November 23

Understanding spatial processes 1: Vector data analysis

Readings: Chapter 11

Week 11 - November 30

Understanding spatial processes 2: Vector data analysis

Readings: No readings

Week 12 - December 7

Story map project: Discussion with instructor

Readings: No readings

Graduate Course Policies

Department of Geography & Planning

Important Dates

Graduate courses are normally a minimum of 2-3 hours/week for 12 weeks. Reading week is optional for graduate courses. If observed, the instructor will inform the class and provide a make-up date for the missed class.

Fall 2020

July 30, 2020	Course enrolment opens
September 8, 2020	F (fall) and Y (fall-winter) session graduate courses and seminars begin
September 11, 2020	Final registration deadline
September 21, 2020	Deadline to add F (fall) and Y (fall-winter) session courses
October 26, 2020	Deadline to drop Fall courses
October-November 2020	Undergraduate reading week*

Winter 2020

January 4, 2021	S (winter) session graduate courses and seminars begin
January 13, 2021	Grades for F (fall) courses available for viewing on ACORN
January 18, 2021	Deadline to add S (winter) session courses
February 22, 2021	Deadline to drop S (winter) and Y (fall-winter) session courses
April 16, 2021	Grade deadline for students graduating in June 2021

Summer 2021

May 3, 2021	Summer F (May-June) and Y (May-August) session graduate courses and seminars begin
May 19, 2021	Grades for S (winter) and Y (fall-winter) courses available for viewing on ACORN
May 28, 2021	Final date to drop F (May-June) session courses without academic penalty
June 7, 2021	Summer S (July-August) session graduate courses and seminars begin
July 14, 2021	Grades for F (May-June) courses available for viewing on ACORN

* Reading week applies to undergraduate programs, and is optional for graduate courses, at the discretion of the instructor. If observed, the instructor will inform the class and provide a make-up date for the missed class. This may include an extra class at the end of term. Fall reading week dates: UTSC – October 10-16; UTM – October 13-16; UTSG – November 9-13. Winter reading week dates: UTSC – February 13-19; UTM – February 16-19; UTSG – February 16-19.

Course Syllabi

A final course syllabus, which includes all assignments, deadlines and weighting of methods of evaluation, must be made available to all students enrolled in the course as early as possible, no later than the deadline for enrolling in classes. Changes to the methods of evaluation or their relative weights

cannot be made after this date without the consent of a simple majority of students in the class, provided a vote is announced at the previous class meeting.

Late Assignments

Instructors are not obligated to accept late work, except where there are legitimate, documented reasons beyond a student's control. In such cases a late penalty is not normally applied. In all other circumstances, if an instructor intends to accept and apply penalties to late assignments this will be clearly set out in the syllabus.

Attendance and Participation

Although attendance makes up no more than 20% of the final course grade, regular and consistent attendance in graduate courses is expected. Most graduate courses are seminar style classes, which involve collaborative work and in-class discussions with other students and instructors. Students who are unable to attend class each week must inform the instructor as early as possible.

Accessibility and Accommodations

The University of Toronto is committed to accessibility. If you require accommodations because you are disabled, or have any accessibility concerns about the course, the classroom or course materials, please contact [Accessibility Services](#) as soon as possible.

Where there is an accommodation recommended by Accessibility Services, the department and/or instructors will be provided with an accommodation letter.

Academic Integrity

Academic misconduct by graduate students is taken very seriously. The University's policy on academic misconduct is found in the Code of Behaviour on Academic Matters (the Code). Students in graduate studies are expected to commit to the highest standards of integrity and to understand the importance of protecting and acknowledging intellectual property. For example, it is assumed that they bring to their graduate studies a clear understanding of how to cite references appropriately, thereby avoiding plagiarism.

Regarding plagiarism, the Code includes the following statements:

B.i.1. It shall be an offence for a student knowingly:

(d) to represent as one's own idea or expression of an idea or work of another in any academic examination or term test or in connection with any other form of academic work, i.e., to commit plagiarism.

Wherever in the Code an offence is described as depending on "knowing," the offence shall likewise be deemed to have been committed if the person ought reasonably to have known.

Other academic offences include the possession and/or use of unauthorized aids in examinations, submitting the same paper for different courses, forgery (whether of academic records or other documents), concocting facts or references to sources, personating someone, and other forms of

cheating and academic dishonesty. Please refer to sections B.i.1. and B.i.3. in the Code for detailed descriptions of offences applicable to students.

The [SGS Academic Integrity Resources](#) webpage outlines the policy on academic misconduct and the process for handling an allegation of academic misconduct.

Coursework Extensions

The authority to grant an extension to submit coursework beyond the sessional grade deadline is with the department and not the instructor of the course. To request a formal extension, students must submit a Coursework Extension Form, completed by both the student and course instructor, to the relevant graduate department prior to the final grade deadline.

In order to ensure fairness in granting extensions, the department must be reasonably certain that:

- The reasons for delay are serious and substantiated.
- The student is not granted unfair advantage over other students in the course.
- The student has a reasonable chance of completing the outstanding work within the time allotted.
- The normal and satisfactory completion of any new coursework is not in jeopardy.

Extension requests for medical reasons (e.g. short-term illness) must be accompanied by a medical note. Extension requests for students with accommodations due to disability must be supported by documentation from Accessibility Services. Extension requests for other reasons must be detailed in the form or a note to the department.

Religious Accommodations

Students must alert instructors in a timely fashion to any upcoming religious observances and anticipated absences. Instructors will make every reasonable effort to avoid scheduling tests, exams or other compulsory activities at these times. In the case of an unavoidable conflict with a compulsory activity, every reasonable effort is made to give students the opportunity to make up missed work.

Course Enrolment and Quercus

Acorn is the only indicator of official course enrolment; Quercus is not. Students enrolled in Acorn will be automatically populated to a course's Quercus site within 24 hours of enrolling. In some cases, if a student is on a course wait list or there is another delay in processing registration an instructor may give a student access to Quercus as a guest. This will not constitute official enrolment and students are responsible for making sure the course is added correctly using Acorn.

Auditing

Students who wish to audit a course must obtain permission directly from the course instructor within the first week of class. Permission is subject to available space and can only be granted by the course instructor.

Only registered students at the University of Toronto may audit courses. Auditing entitles a student to attend lectures only. Students may not submit any written work, attend labs/tutorials or write

tests/exams. The student will not be enrolled in the course and the course will not appear on their transcript. The department does not provide certificates of attendance.

Reading Courses

Reading courses allow students to complete coursework in topics not covered by current course offerings in Geography or Planning. The [Reading Course Form](#) must be accompanied by a brief course outline.

Copyright in Instructional Settings

If a student wishes to record (tape, video, photograph, etc.) any lecture presentations or other similar materials provided by the instructor; the instructor's written consent must be obtained beforehand. Otherwise, all such reproduction is infringement of copyright and prohibited. In the case of private use by students with disabilities, the instructor's consent shall not be unreasonably withheld.