

JPG1906: Geographic Information Systems

Course Description

This course is an introduction to digital mapping and spatial analysis using a geographic information system (GIS). 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 variety of subject areas within geography and in other disciplines. In the lectures, we discuss mapping and analysis concepts and how you can apply them using GIS software. The practical assignments provide an opportunity for you to learn how to use the software, gaining hands-on experience with ArcGIS from [Esri Inc.](http://www.esri.com), the most popular GIS software and an industry standard in many fields. Course website: <http://portal.utoronto.ca>.

The course is designed to accommodate students from a variety of research backgrounds and with no previous GIS experience. The goal is to provide students with a theoretical understanding of spatial data and analysis concepts, and to introduce the practical tools needed to create and manage spatial data, perform spatial analysis, and communicate results using a well-designed map. Successful students will be able to learn new functions on their own and apply what they have learned to their own research.

There is no prerequisite for this course and students should not have taken any previous GIS courses. A basic familiarity with computers and Microsoft Windows is assumed. A general understanding of geography is helpful, but no prior geography courses are required.



Orientation to the Course



This course is designed so that you can treat it as a traditional face-to-face course, an online course, or a mix of both. The course is structured around weekly topics and activities. Regular classes are held each Friday morning, and you can attend these in person or online. These lectures are also recorded so you can watch them later. The PowerPoint slides used will be made available as PDF files.

Online videos will demonstrate how to use the software and help you to prepare for the assignments.

There is no required textbook for this course. Links to online readings will be provided by the instructor.

Over the course of each week, you are expected to attend and/or watch the lectures and demonstration videos, read all assigned readings, complete assignments, and participate in online discussions as needed. All of the necessary material for each topic is clearly organized and available on the Blackboard course website (under "Course Materials").

In this course, you have the option to gain experience with a variety of communication tools including webinars, videoconferencing, screen sharing, podcasts, discussion forums, and chat windows. Think of this as another aspect of your learning and take the opportunity to learn how to use them effectively.

Please keep in mind: Many of the concepts and skills learned in this course are cumulative. It is essential that you complete all work each week so that you are properly prepared to begin the next week's material. This course is designed to provide great flexibility as to when you work on it, but if you treat it as an online course, it will require more time than a regular course, not less (because you're working more independently) and it's also easier to procrastinate and fall behind. This is why online courses have higher drop rates - don't let this happen to you! If you find you are getting behind, ask for help from your TA or instructor as soon as possible.

Instructor



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Website: <http://portal.utoronto.ca> (Blackboard, requires UTorID & password)

Please feel free to contact me, but be sure to first check the course website and the discussion board and course files to see if the answer to your question is there.

Office hours

In person: open-door policy; drop by or make an appointment. Sidney Smith Hall room 5011.

Online: by appointment (just [e-mail me](#) to set up a time).

Online office hours are held using Adobe Connect web conferencing software using the same URL as for the lectures (it will be posted on Blackboard). The instructor can show PowerPoint slides, do live software demonstrations, and meet with students individually or many at the same time (you can ask questions by typing in a chat window or with a microphone or webcam).

Evaluation

Evaluation will be based on a series of practical lab assignments, designed to expose students to many fundamental techniques for data input, management, and analysis, and map design. The assignments are designed to help you see the connections between the concepts discussed in the lectures and how those concepts are applied in the software. By the end of the course, you should be able to make informed decisions about what tools to use and how to use them, both individually to answer specific questions, and in a sequence to solve larger problems. You should also be able to communicate your results in map and text forms, and interpret and discuss the meaning of those results.

The time required to complete the assignments varies a lot depending on the person. You will be learning how to use complex software, and gaining practical skills in mapping and problem solving, so you should be prepared to commit a substantial amount of time (likely several hours) to this each week.



Lectures (Live with simultaneous webinar)

Friday 10:10-12:00, Sidney Smith Hall, room 2125.

You have the option of attending each lecture in person, online, or both.

My regular, in-class lectures will be shown live on the internet as a webinar and you will be able to ask questions in real time using a "Q & A" window. I will do my best to monitor this during class, and answer questions just as I would if someone were in class and raised their hand. The webinars are recorded and made available online afterwards.

Note: please remember that this is something I offer for your convenience, and do not guarantee availability if there are technical difficulties.

The PowerPoint slides used in class will be made available online as PDF files for students to download prior to each lecture.

Lecture/webinar FAQ:

What will I see online? You will see whatever is shown using the projector in class - mainly PowerPoint slides, but also any software demonstrations or websites that are shown. Usually, there will not be video of the instructor, but you will hear me talking (so you may want to use earbuds/headphones). No audio or video of students will be intentionally captured or recorded (although sometimes students asking questions are inadvertently recorded by my microphone). Any questions asked by students in the lecture hall will be repeated by the instructor for the benefit of those watching online.

How do I access the live webinar? At any time during the lecture, go to the link provided on Blackboard, select "Enter as a Guest" and type in a screen name (this can be whatever you want, but I strongly encourage you to use your real name so we can all get to know each other; it will appear when you enter the webinar "room" and will be part of the recording). The webinars will be conducted with Adobe Connect software and should be accessible from any web browser (you may have to install a browser plug-in) and on most devices (you will have to download an Adobe Connect app for phones or tablets).

How do I ask a question in the webinar? Just type your question into the Q & A window and click the "Send Question" button next to it (it looks like a little comment balloon) or press the Enter key on your keyboard. You can use the "Set status" drop-down menu at the top of the window to raise your hand or provide other feedback (e.g., speed up, slow down), but this is optional. If you don't have a question, but want to make a comment for others to see, use the Chat window. Audio and video questions are not available during the lectures, but can be used during office hours.

How do I see a recording of the webinar later? The entire webinar will be recorded and will be made available through a URL link shortly after class in the usual "Lectures" section of the Course Materials.

Lab Sessions

Fridays, 12:10-2:00 in Sidney Smith Hall room 620 (Level "G", one floor below street level).

Note: The first lab session will be after the second class.

Attendance is not mandatory, but is strongly recommended, as a teaching assistant will be there to introduce assignments, provide assistance, and take up assignments once they have been graded. Please note that the teaching assistant's role is to guide you and make suggestions but in order to learn the concepts and software, you must be prepared to try things on your own. Make sure you monitor the discussion board, as this is often where you will get valuable tips and other help.

Options for Using the GIS Software

To complete the assignments, you will need to use ArcGIS for Desktop 10.2 or newer (Advanced version) made by [ESRI Inc.](#) You have several options for accessing ArcGIS. The "default" option is to use the computers in the GIS Lab, since you are able to complete all of your work for this course using those computers. For your convenience, you also have the options of installing ArcGIS on your own computer and/or running it virtually through a web browser. Please note that you are responsible for ensuring that you have access to ArcGIS using one of these methods. **Encountering a technical problem using any option other than the GIS Lab is not a valid reason for an assignment deadline extension.** If you do run into problems, check the FAQ page on the discussion board and, if needed, post a question so that we can resolve the problem as quickly as possible.



Use ArcGIS in the GIS Lab

The GIS Lab is in Sidney Smith Hall room 620, on Level "G", one floor below street level. You will have to login using a geography account (not your UtorID). Your account will be set up before the course starts. Instructions for using the GIS Lab are available on Blackboard as a PDF document. You can use the computers during scheduled Help Desk hours, and check the lab schedule on the GIS lab room door for other times that the room is available for general use.

Install ArcGIS on your own computer

PC: Students can download and install a free, one-year student edition of ArcGIS on a Windows computer. Since all of the assignments and data will be available for download from Blackboard, many students find this to be a convenient option. You can download the software from the University of Toronto Map and Data Library [here](#) and if you need installation assistance, contact gis.maps@utoronto.ca. An internet connection is not required to run ArcGIS once it is installed.

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 how to install ArcGIS on a Mac, go to <http://edcommunity.esri.com/software-and-data/mac-os-support>.

Run ArcGIS over the Internet

If you are unable to install ArcGIS on your own computer (or just prefer not to), you have the option of running it over the internet. Using XenApp by Citrix, your ArcGIS session runs remotely on a server, and you interact with it using a "thin client" window that can be used on a Mac or PC with nothing to install on your computer other than the small and simple Citrix Receiver (and Windows is not required if you're using a Mac). An internet connection is required in order to use ArcGIS via Citrix. Instructions on how to get started with Citrix can be found by clicking on the GIS Software menu link in Blackboard.

Note: Before using Citrix, you will need to verify your UtorID by going to this [web page](#) . You have to do this even if you have previously activated your UtorID, (you will only have to do this once).

You will find the course data on the N: drive in Citrix, and your student workspace (where you can save your files) is the G: drive. Remember that, in order to access any drive in ArcMap, you have to first click on the Connect Folder icon in the Catalog pane in ArcMap and select the drive.

Note: assignments are completed in Blackboard using a web browser. If you are using Citrix, it is best to complete your work in ArcGIS and then use a browser inside Citrix to complete the assignment.

Warning: you may experience slow performance if there is heavy demand on the Citrix server, such as the night before an assignment deadline. Please plan accordingly.

Use ArcGIS in Robarts Library

The Map and Data Library (fifth floor) has 20 workstations with ArcGIS and there are another 40 computers on the fourth floor. The staff there are available to help with any problems or technical questions you may have with ArcGIS, but are not able to provide specific help with assignments.

Note: files stored on your F: drive in the GIS Lab cannot be accessed from the library.

Getting Help

Learning how to use software to complete various tasks can sometimes be challenging. The ability to work independently is a valuable skill for all GIS users, and it is important that you take advantage of all available resources, including lecture recordings, video demonstrations, and readings in the specified ArcGIS Help sections. However, if you are stuck and are not able to find a solution from the resources provided, you are encouraged to post a question to the course discussion board. Chances are that another student or a TA has encountered a similar problem and will be able to offer advice.

Lecture questions

You are strongly encouraged to use the discussion board to ask your fellow students and/or the course instructor questions. Students sometimes feel isolated and that they have no one to talk to about the course. Don't let this happen! If you participate in conversations online, you'll have a much easier time understanding the material, keeping up, and you will likely find the course experience more enjoyable. Using the discussion board also allows other students to benefit from the discussion and dramatically improves efficiency in communication. E-mail to your TA or the instructor should only be used for personal questions, such as requests for deadline extensions due to illness.

Assignments and technical support

- Consult the readings, video demonstrations, and podcasts, all found under Course Materials
- [ArcGIS Help](#), [ArcGIS online forums \(GeoNet\)](#)
- Ask your fellow students, TAs, and instructor via the discussion board (you are encouraged to ask and answer questions in the forum, keeping in mind that you cannot describe your methods or post images of your maps, or provide answers to specific assignment questions – if you need to do this, then post a [private question](#) (instructors only) to Piazza, that can only be seen by the instructor and TAs
- Ask your TA during lab sessions, through the discussion board, or during office hours
- Ask your course instructor

Learner Support Available at the University of Toronto

The university provides a range of student support related to student life and academic success. Learner supports include services related to University Life, Library, Academic skills support, IT support and more. See [Learner Support Available at the University of Toronto](#).

Course Policies

Late penalty

A penalty of 5% of the total mark for the assignment will be applied per day, up to 7 days (including weekends and holidays), after which assignments will not be marked. Penalties are calculated for each 24-hour period after the deadline. If an assignment has been handed back, no other assignments will be accepted, even if it has not been 7 days.

Technical problems

This course requires the use of computers, and many things can go wrong when using them. You are responsible for ensuring that you maintain regular backup copies of your files, use antivirus software (if using your own computer), and schedule enough time to allow for delays due to technical difficulties. Computer viruses, crashed hard drives, lost or corrupted files, incompatible file formats, etc. are common issues when using technology, and are not acceptable grounds for a deadline extension.

In case of illness

Requests for assignment deadline extensions must be made to the instructor within five 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, and must clearly indicate that you were incapacitated for the date of a test or for several days in the case of an assignment (being ill immediately prior to the deadline for a two-week assignment is not sufficient grounds for a deadline extension).

Inquiries about graded term work

Any inquiries about marking must be made within two weeks of the return date of the work. This is in accordance with Arts and Science rules as stated in the calendar. Please contact the person that did the marking first. If, after discussing the issue with the marker, you are still not satisfied with the explanation for your mark, you should then contact the instructor.

Accessibility needs

The University of Toronto and the course instructor are committed to accessibility. If you require accommodations or have any accessibility concerns, please visit the [Accessibility Services website](#).

Academic offences

Plagiarism and other academic offences including impersonating another student or providing false or altered medical forms, death certificates, or similar documents will not be tolerated. For more information, please refer to the [Code of Behaviour on Academic Matters](#).

Use of class materials and copyright notice

The materials used in this class, including, but not limited to lecture notes, video recordings, exams, quizzes, and assignments are copyright protected works. If a student wishes to photograph, record audio and/or video, or otherwise reproduce lecture presentations, course notes or other similar materials provided by the instructor, he or she must obtain the instructor's written consent beforehand. Otherwise, all such reproduction is an infringement of copyright and is absolutely prohibited. In the case of private use by students with disabilities, the instructor's consent will not be unreasonably withheld.

Course Schedule

| DATE | TOPIC | ASSIGNED ¹ | DUE |
|----------|--|----------------------------|----------------------|
| Sept. 16 | Course introduction: what's this course about, and why take it? What is a GIS?: Definition of a GIS, and why you might want to use one | NO LAB SESSION | |
| Sept. 23 | Introduction to ArcGIS: getting started with ArcCatalog and ArcMap | ArcGIS Exercise (0%) | |
| Sept. 30 | Map design: cartographic methods to improve map communication | Map Design (15%) | |
| Oct. 7 | The Earth and its coordinate system: how to specify a location on the surface of the Earth, and why it is so important to mapping | | |
| Oct. 14 | Map projections: creating a 2D map of a 3D world | Map Projections (20%) | Map Design |
| Oct. 21 | Mapping quantitative data: creating, editing, and joining tables, and exploring and classifying attribute data for mapping | | |
| Oct. 28 | Quantitative map types: making an effective map from quantitative data | Quantitative Mapping (25%) | Map Projections |
| Nov. 4 | Queries and data preparation: selecting data based on location or values in a table; tasks often performed when making a map | | |
| Nov. 11 | Distance and overlay: methods for determining distance from features and for comparing different map themes found at the same location | Overlay Analysis (25%) | Quantitative Mapping |
| Nov. 18 | Geoprocessing: using a flowchart-drawing tool called ModelBuilder to create and then execute a sequence of GIS tools to document, automate, and share your work | | |
| Nov. 25 | Geocoding: mapping postal codes and street addresses | Geocoding (15%) | Overlay Analysis |
| Dec. 2 | Web apps and story maps: creating a series of customized web maps to tell a story with maps, data, and images using ArcGIS Online Data acquisition: finding data and using metadata to assess its value | | Geocoding |

¹ Lab assignments are assigned and due at the start of your lab session during the week listed above (except the geocoding assignment, which is due Dec. 2 at 5:00 pm). Please keep in mind that the instructor is not available on weekends and will usually reply to emails/posts on Monday.

The instructor reserves the right to modify the topics and schedule during the term.