JPG1906: GEOGRAPHIC INFORMATION SYSTEMS

Course Outline

DESCRIPTION

This course is an introduction to digital mapping and spatial analysis using a geographic information system (GIS). Students learn how to create their 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 assignments give students the opportunity to learn for themselves how to put that theory into practice, gaining more hands-on experience with ESRI ArcGIS software, the most popular GIS and an industry standard in many fields.

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 should be able to learn new functions on their own and apply what they have learned to their own research.

INSTRUCTOR

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Course website (Blackboard): http://portal.utoronto.ca (requires UTORid and password)

Office hours

In person: open-door policy; feel free to drop by or make an appointment if you want to be sure I’m available. Sidney Smith Hall room 5011.

Online: by appointment; contact me to set up a time.

Your TA will also have office hours to help you with the assignments (check Blackboard for times).

Online office hours are held using Adobe Connect web conferencing software. Use this URL to enter the virtual room: http://geogutoronto.adobeconnect.com/donboyes/. With Adobe Connect, the instructor can show PowerPoint slides from podcasts, do live demonstrations of the GIS software, and meet with students individually or many at the same time (you can either ask questions by typing in a chat window or by using a microphone or webcam if you prefer).

There is no preparation required to use the online office hours, but you might find these links helpful:


While you are always welcome to contact me, be sure to first check the course website, including the discussion board and course files to see if the answer to your question is there. If you think your TA might be able to help, please try them first (for the sake of time management).
PREREQUISITE

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

LECTURES

Friday 11:10-1:00, Sidney Smith Hall room 2125.

Enter the lecture webinar here: http://geogutoronto.adobeconnect.com/jpg1906_13f_lectures/

My regular, in-class lectures will be shown live on the internet as a webinar. This means that you have the option of watching the lecture live on the internet and you are 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. However, please keep in mind that these files are designed to be part of a presentation. They are not complete lecture notes or study notes; in fact, they often won’t make a lot of sense on their own and are definitely not a substitute for attending class.

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 ArcGIS demonstrations or websites that are shown. There will not be video of the instructor, but you will hear me talking (so you may want to use earbuds/earphones). No audio or video of students will be intentionally captured or recorded (although sometimes students 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 above, select "Enter as a Guest" and type in a screen name (this can be whatever you want; it will appear when you enter the webinar "room" and will be part of the recording). This webinar will use Adobe Connect software and should be accessible from any web browser.

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.

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.
SOFTWARE DEMONSTRATIONS

Video clips will be provided online that demonstrate various aspects of using ArcGIS. These will help prepare you for completing the assignments.

READINGS

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

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.

ONLINE DISCUSSION

There is a lot to learn in this course, and you will find that interacting online with other students, the teaching assistant, and the instructor will make your learning experience more efficient and more enjoyable. You are strongly encouraged to ask and answer questions in the Blackboard discussion board forums. You can subscribe to the forums so that you are notified when there is a new post. If you have a smart phone or tablet, you may be interested in using Blackboard Mobile Learn, which makes participation in the online discussions more convenient.

ASSIGNMENTS

The assignments are designed to help you see the connections between the concepts discussed in the lectures and how those concepts are implemented 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.

GIS LAB SESSIONS

In order to complete the assignments, you will need access to the ArcGIS software. Lab sessions will be held Fridays, 1:10-3:00 in Sidney Smith Hall room 620 (Level "G", one floor below street level), starting on Sept. 20.

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 forums, as this is often where you will get valuable tips and other help.

If you have to work on an assignment outside of your scheduled lab sessions you can install the software on your own computer, or check the lab schedule on the GIS lab room door for times that the room is available for general use.
OPTIONS FOR USING THE GIS SOFTWARE

In order to complete the assignments, you will need to use ArcGIS for Desktop (Advanced version) made by ESRI Inc. You have several options for accessing ArcGIS:

**Use ArcGIS in the GIS Lab**

The GIS Lab is located in Sidney Smith Hall room 620 (Level “G”, one floor below street level) and is open Monday to Friday, 8:00 am to 10:00 pm. You have access to the lab during your practical sessions each week, as well as any time the lab is open and no other scheduled classes are using it (a schedule is posted on the lab door). 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.

**Install ArcGIS on your own computer**

**PC:** If you have a Windows computer, you have the option of downloading and installing a free, one-year student edition of ArcGIS on your own computer. Since all of the assignments and necessary data will be available for download from the course website, many students find using ArcGIS on their own computer to be a convenient option. You can download the software from the University of Toronto Map and Data Library. For instructions, click [here](#) and if you need installation assistance, contact [gis.maps@utoronto.ca](mailto:gis.maps@utoronto.ca). An internet connection is not required to run ArcGIS once it is installed.

**Mac:** The ArcGIS software is Windows-only, but it is possible to install it on a Mac (note: you will need a licensed copy of Windows). You can download ArcGIS from the University of Toronto Map and Data Library. For instructions, click [here](#) and if you need installation assistance, contact [gis.maps@utoronto.ca](mailto:gis.maps@utoronto.ca). For information on how to install ArcGIS on a Mac, please see this [web page](#). An internet connection is not required to run ArcGIS once it is installed.

**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.

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. You should only have to do this once. 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.

**Use ArcGIS in Robarts Library**

There are two computer labs in Robarts Library that have ArcGIS installed. The Map and Data Library (5th floor) has 20 workstations. The staff there are available to help with any problems or questions you may have with ArcGIS, and can provide general advice. Please note that they are not able to provide any specific help related to your assignments. There are another 40 computers on the 4th floor that have ArcGIS installed.
GETTING HELP

Learning how to use software to complete various tasks and solve geographic problems 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 podcasts, video demonstrations, and readings in the specified ArcGIS Help sections. However, if you get 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:
- Consult the readings, video demonstrations, and podcasts, all found under Course Materials
- ArcGIS Help 10.2
- Ask your fellow students via the Discussion Board (you are encouraged to ask and answer questions in the forum, keeping in mind that you cannot provide answers to specific assignment questions and should not post images of your maps)
- Ask your TA, through the Discussion Board, by e-mail (see the Contacts link on Blackboard), or through online office hours
- Ask the course instructor, through the Discussion Board, by e-mail, phone, in person, or through online office hours

Technical (software) support
- ArcGIS Help 10.2, ArcGIS online forums
- Ask your TA, through the Discussion Board, by e-mail (see the Contacts link on Blackboard), or through virtual office hours
- Ask your course instructor

Learner Support Available at the University of Toronto
For information on student services and resources for things like writing skills, library resources, IT services, and accessibility services, consult this website.
COURSE POLICIES

Late penalty
A penalty of 5% of the total mark for the assignment will be applied per day, up to 7 days (excluding weekends and holidays), after which assignments will not be marked. If an assignment is submitted after the deadline, it will be penalized for that day (up to 24 hours after the time it was due, after which an additional 5% will be deducted for each subsequent 24-hour period). 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). Submit answers to assignment questions using the Blackboard pages provided and submit any maps or other figures as JPEG files using the Blackboard assignment tool. Printed or e-mailed submissions are not accepted.

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 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 a deadline extension.

In case of illness
Requests for assignment 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, 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- or three-week assignment is not sufficient grounds for a deadline extension).

Inquiries about graded term work
Any inquiries must be made within one month 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 as soon as possible.

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 Arts and Science Code of Behaviour on Academic Matters.

Other Student Support Resources
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.
### JPG1906 COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assigned</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sept. 13</td>
<td><strong>Course introduction</strong>: what’s this course about, and why take it? <strong>What is a GIS?</strong>: Definition of a GIS, and why you might want to use one</td>
<td>NO LAB SESSIONS</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Sept. 20</td>
<td><strong>Introduction to ArcGIS</strong>: getting started with ArcCatalog and ArcMap</td>
<td>LAB SESSIONS BEGIN</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Sept. 27</td>
<td><strong>Map design</strong>: cartographic methods to improve map communication</td>
<td>Map Design (15%)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Oct. 4</td>
<td><strong>The Earth and its coordinate system</strong>: how to specify a location on the surface of the Earth, and why it is so important to mapping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Oct. 11</td>
<td><strong>Map projections</strong>: creating a 2D map of a 3D world</td>
<td>Map Projections (20%)</td>
<td>Map Design</td>
</tr>
<tr>
<td>6</td>
<td>Oct. 18</td>
<td><strong>Mapping quantitative data</strong>: creating, editing, and joining tables, and exploring and classifying attribute data for mapping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Oct. 25</td>
<td><strong>Quantitative map types</strong>: making an effective map from quantitative data</td>
<td>Quantitative Mapping (25%)</td>
<td>Map Projections</td>
</tr>
<tr>
<td>8</td>
<td>Nov. 1</td>
<td><strong>Queries and data preparation</strong>: selecting data based on location or values in a table; tasks often performed when making a map</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Nov. 8</td>
<td><strong>Distance and overlay</strong>: methods for determining distance from features and for comparing different map themes found at the same location</td>
<td>Overlay Analysis (25%)</td>
<td>Quantitative Mapping</td>
</tr>
<tr>
<td>10</td>
<td>Nov. 15</td>
<td><strong>Geoprocessing</strong>: using a flowchart-drawing tool called ModelBuilder to create and then execute a sequence of GIS tools to document, automate, and share your work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Nov. 22</td>
<td><strong>Geocoding</strong>: mapping postal codes and street addresses</td>
<td>Geocoding (15%)</td>
<td>Overlay Analysis</td>
</tr>
<tr>
<td>12</td>
<td>Nov. 29</td>
<td><strong>Data acquisition</strong>: finding map data online and using metadata to assess its value <strong>Discovering what’s new in GIS</strong>: keeping up with the latest trends in the field</td>
<td>Geocoding</td>
<td></td>
</tr>
</tbody>
</table>

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 Nov. 29 at 5:00 pm).

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

**Note**: should an unexpected technical issue with university system availability or functionality arise, it may be necessary to revise the timing or weighting of the assessments.