GEOG*2480
Mapping and GIS

MWF 9:30-10:20a

Lectures: JTP 2266 (John T. Powell)
Labs: 231 Hutt

Fall 2019

University of Guelph

Department of Geography, Environment and Geomatics

Instructor
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Office: 344 HUTT
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Teaching Assistants
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Course Outcomes
By the end of this course, you will be equipped with the conceptual and technical tools to: confront spatial datasets you haven’t worked with before; understand their features (data structure and type); and, work comfortably in industry-standard software to appropriately project, symbolize, analyze, and present the data.
Course Description
This course introduces the use of geographic information systems (GIS) to manipulate spatial information and create effective maps. By completing instructional tutorials and a set of lab assignments, students will acquire competencies in using GIS to organize, query, analyze, and cartographically display georeferenced data on a variety of environmental and social topics (e.g. land use change, Census statistics, and crime rates).

How do we properly portray our 3-D world on 2-D screens and prints? The first part of this course focuses on the digital representation of real-world geographic features, in both vector and raster data structures. We will examine concepts of scale, generalization, coordinate systems, geodetic datums, and map projections.

How do we analyze spatial data and communicate our findings? The second part of the course emphasizes data processing and symbolization methods for thematic maps. We will cover data classification techniques as well as basic tools for (automated) geoprocessing. Guidelines for effective map design are introduced, with consideration for matching different data types and scales of measurement with appropriate symbolization techniques.

Throughout, we will also consider the ethical dimensions of mapping practice, including what should and should not be mapped.

Course Organization
Three lectures per week
- Monday, Wednesday, Friday | 9:30 - 10:20a | John T. Powell Building 2266

One two-hour lab per week (all in Hutt 231)
- Section 101: Monday 1:30 - 3:20p
- Section 102: Tuesday 9:30 - 11:20a
- Section 103: Thursday 9:30 - 11:20a
- Section 104: Thursday 1:30 - 3:20p
- Section 105: Tuesday 1:30 - 3:20p

Course References


This course has an accompanying website accessible through CourseLink on the University of Guelph webpage. This site includes printable PDF copies of certain course materials including
some readings and copies of the PowerPoint slides used in class. However, don’t expect the slides to cover all the material presented in class.

Evaluation

- Laboratory Assignments (5, equal weight) 50%
- Mid-Term Exam (October 18, in-class) 20%
- Final Exam (December 13, location TBD) 30%

How to do well in this course

- Come to lectures
- Do the readings
- Go to your lab section
- Complete the tutorials and lab assignments
- Work through technical problems, with the help of online forums
- Ask questions when you’re feeling stuck!!

Weekly Lecture Schedule, Topics, and Readings

It is strongly recommended that you come to lecture and lab having already completed the week’s assigned reading.

<table>
<thead>
<tr>
<th>Week of...</th>
<th>#</th>
<th>Topic</th>
<th>Reading and/or assignment</th>
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<tbody>
<tr>
<td>September 9</td>
<td>1</td>
<td>Introduction to mapping and GIS</td>
<td>• Ch. 1&lt;br&gt;• Ch. 10 (pgs. 279-285)</td>
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<tr>
<td>September 16</td>
<td>2</td>
<td>Spatial data structures: vectors and rasters</td>
<td>• Ch. 5&lt;br&gt;• LAB 1 ASSIGNED&lt;br&gt;• Extra marks: reflections on lab 1 progress (Due September 20 in-class)</td>
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<td>September 23</td>
<td>3</td>
<td>Measuring Earth: map scale, geodesy, coordinate systems, and projections</td>
<td>• Ch. 2</td>
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<tr>
<td>September 30</td>
<td>4</td>
<td>Data classification</td>
<td>• Ch. 8 (pgs. 240 – 244)&lt;br&gt;• Ch. 10 (pgs. 285-290)&lt;br&gt;• LAB 1 DUE&lt;br&gt;• LAB 2 ASSIGNED</td>
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<tr>
<td>October 7</td>
<td>5</td>
<td>Symbolizing thematic data: area, point, and linear approaches</td>
<td>• Ch. 10 (pgs. 296-312)</td>
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<td>Week of...</td>
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<td>Topic</td>
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<td>October 14 (no class on the 14th)</td>
<td>6</td>
<td>Mid-Term review</td>
<td>• LAB 2 DUE</td>
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<td>• LAB 3 ASSIGNED</td>
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<td>• October 18: In-Class Mid-Term Exam</td>
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<td>(covering weeks 1-5)</td>
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<tr>
<td>October 21 (no class on the 25th)</td>
<td>7</td>
<td>Geospatial data</td>
<td>• Ch. 4</td>
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<td>October 28</td>
<td>8</td>
<td>Spatial analysis</td>
<td>• Ch 6. (149-180)</td>
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<td>• LAB 3 DUE</td>
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<td>• LAB 4 ASSIGNED</td>
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<tr>
<td>November 4</td>
<td>9</td>
<td>Automating spatial analysis: modeling and</td>
<td>• [<a href="https://geoawesomeness.com/programming-">https://geoawesomeness.com/programming-</a></td>
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<td></td>
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<td>programming</td>
<td>arcgis-python-beginners-guide/]</td>
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<td>November 11</td>
<td>10</td>
<td>Map design</td>
<td>• Ch. 1 from “Designing Better Maps” – available</td>
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<td>on Courselink</td>
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<td>• Ch. 10 (pgs. 290-296)</td>
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<td>• LAB 4 DUE</td>
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<td>• LAB 5 ASSIGNED</td>
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<tr>
<td>November 18</td>
<td>11</td>
<td>Webmapping</td>
<td>• [<a href="https://www.axismaps.com/guide/web/what-is-a-">https://www.axismaps.com/guide/web/what-is-a-</a></td>
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<td>web-map/]</td>
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<td>November 25</td>
<td>12</td>
<td>Course review</td>
<td>• LAB 5 DUE Friday the 29th by 5pm</td>
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<td>December 13</td>
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<td>• Final Exam</td>
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**Laboratory Assignments**

Lab. #1: Introduction to ArcGIS  
Due the week of September 30

Lab. #2: Map Projections and Coordinate Systems  
Due the week of October 14

Lab. #3: Data Classification and Thematic Mapping  
Due the week of October 28

Lab. #4: Spatial Analysis I  
Due the week of November 11

Lab. #5: Spatial Analysis II  
Due November 29 by 5pm
Unless otherwise noted, labs are due at the beginning of your regular lab session during the week indicated.

The laboratory material constitutes an integral part of this course and attendance at one lab session per week is mandatory. Material covered in lab will be tested on the mid-term and final exams.

Late assignments will only be accepted without penalty with prior approval of either the instructor or the teaching assistant. Otherwise, there will be a penalty of 10% of the assignment’s value per day (including weekend days) for late assignments.

There is a $20.00 lab fee associated with this course, but it is collected by the TAs as-needed. $20 covers $10 for print credits and $10 for a hardy copy of the lab manual (PDFs of the manual will be available for free on CourseLink). Students must provide their own USB memory sticks to back up their computer files. Lost files are not a valid reason for handing in a late assignment.

This course has several graduate teaching assistants to instruct labs and provide individual support during office hours. A list of assistants, including their contact information and office hours, will be posted in Room 231 Hutt. You must consistently attend the same lab section, but may consult with any of the TAs during office hours.

What you can expect from me

- To help you not only understand but get excited about the material, learning as much as possible about mapping! We’re all coming from different perspectives and starting points, meaning that it is everyone’s responsibility, but especially mine, to work to provide a respectful and engaging learning environment. I'm here to work with you from where you are and build up your understanding of the course content.
- To provide prompt feedback on assignments.
- To give you a sense of the flow of the semester – when the assignment load will be heavier, so that you can prepare appropriately.
- To assist in developing your critical analysis and communication skills, through our assignments. These are skills that will be useful to you in both your chosen profession and as a citizen.
- To advise you on future coursework, jobs, grad school, and/or volunteering opportunities.

What I expect of you

- To treat each other with respect. Our classroom is a safe space for all students, regardless of sex, gender, race, ethnicity, religion, age, sexual orientation, nationality, ability or disability. Every person is welcome here.
• To communicate with me about what you expect from the course, what you need, and your challenges.
• To put your best possible effort into this class.

A brief Q&A

Q: How do I contact you?
A: Email is best. I will check it often during weekdays until 6pm, and occasionally in the evenings and weekends. I will respond to your requests and questions as soon as I can. Please do not count on an immediate response, especially for important last minute questions regarding assignments.

Q: I’m confused about the material—what should I do?
A: First off, don’t feel embarrassed—few scholars, whether undergraduates or tenured professors - understand everything completely the first time! Please bring your questions to class and/or lab! If you are confused, it’s likely that your classmates are, too. If you bring me questions, it helps me evaluate how best to help you learn the material. If you are still confused, please come to my office hours. I am glad to help!

Q: I have to miss lecture or an exam/lab for a family/personal/medical emergency. What should I do?
A: As soon as possible, get in touch – with me (Prof Nost) concerning exams, or with your lab TA if it concerns an assignment. In addition to alerting me ahead of time (if possible) and finding out what you need to do, I recommend getting notes from a classmate. I will make lecture slides available on CourseLink, but there is often key material that is not spelled out in powerpoints. So get notes AND review the lecture slides.

Q: I'm not happy about my exam/lab grade. Will you change it?
A: For regrades, I reserve the right to either increase OR decrease your grade depending on what I find in regrading. For a regrade, wait 24 hours, then schedule a meeting with me and email a written description of why you deserve a better grade.
University of Guelph Policy Statements

E-mail Communication
As per university regulations, all students are required to check their <mail.uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement
When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration.

Drop Date
The last date to drop one-semester courses, without academic penalty, is Friday, November 29. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar.

Copies of out-of-class assignments
Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility
The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact Student Accessibility Services as soon as possible.

For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: http://www.uoguelph.ca/csd/

Academic Misconduct
The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.
An example of academic misconduct that might occur in this course is to copy an answer, on an exam or lab exercise, from another student. Each student must create their own digital files for computer-based exercises.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar.

Recording of Materials
Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources
The Academic Calendars are the source of information about the University of Guelph’s procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.