Lab 3: A land use map of the Guelph area

Course Organization

- Seven 12-minute mini-lectures recorded and posted to CourseLink each week
- One live session of demos, activities, and guest lectures per week (Friday 9:30-10:20a Eastern) via Zoom
- One two-hour lab per week via Teams

Instructor

Dr. Eric Nost | enost@uoguelph.ca
Office hours: Monday and Wednesday 9:30-10:30a Eastern through Zoom

Teaching Assistants

Nathan Adams - nadams04@uoguelph.ca
Mayah Obadia - obadiam@uoguelph.ca

Learning Outcomes

By the end of this course, you will be equipped with the conceptual and technical tools needed to work with a variety of geospatial data. You will be able to:

1. identify these data sets’ features (e.g. data models and type);
2. work independently in industry standard GIS software to appropriately project, symbolize, analyze, and present the data.
3. critically reflect on data sources, analysis methods, and the advantages and disadvantages of different software programs.
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 societal topics (e.g. land use change, Census statistics, and COVID-19 rates).

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

How do we analyze spatial data? The second part of the course emphasizes data processing and symbolization methods for thematic maps. We will cover classification techniques and how to match different data types and levels of measurement with appropriate symbols. Basic tools for (automated) geoprocessing and webmapping are also introduced. Guidelines for effective map design are highlighted.

Throughout, we will also consider the ethical dimensions of mapping practice, including topics such as location-based surveillance.

Textbook

In order to facilitate participation in this course, we will be using an open access textbook. A PDF copy is available to you free of charge at the above link, and you may also view and read chapters online.

Evaluation
- **Lab Assignments** (4, equal weight) 60%
  - Lab assignments are where you apply the knowledge we are producing through readings and lectures. They are essential for building the technical skills you’ll need to take your geomatics training to the next level. Each lab assignment consists of:
    - A set of technical tutorials
    - A series of applications
    - Written reflections
- **Participation/Quizzes** (you will be assessed on your top 10, 1% each) 10%
  - 10 weekly quizzes –
Each week I will deliver ~ 5 questions to you through Courselink. You can take these quizzes whenever you like and they will provide you with timely feedback, keep you on track with the readings, and ensure you are understanding the labs.

- 9 Friday live sessions
  - To create a community amongst ourselves and learn by doing: demos, “hands-on” activities, polls, and guest lectures.
  - You will be assessed on your best 10 of these participation opportunities. That may be any combination of attending live sessions and taking the weekly quizzes.

- **Exam 1** (February 26, through Courselink) 15%
  - Exam 1 will consist of approximately 30 minutes worth of multiple choice and matching questions (~45), though you will have 50 minutes to complete it at any point in the day.

- **Exam 2** (April 9, through Courselink) 15%
  - Exam 2 will consist of approximately 30 minutes worth of multiple choice and matching questions (~45), though you will have 50 minutes to complete it at any point in the day.

How to do well in this course

- Take care of yourself, and communicate with your instructor and TA about the challenges you are facing
- Watch lectures, take notes, come to Friday sessions and engage in the exercises
- Do the readings and complete the weekly quizzes
- Attend your lab section and complete the lab assignments
- Work through technical problems with the help of your classmates, TA, prof, and online forums
- Ask questions when you’re feeling stuck!!

Schedule

<table>
<thead>
<tr>
<th>Week of...</th>
<th>#</th>
<th>Topic</th>
<th>Reading</th>
<th>Lab</th>
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<tbody>
<tr>
<td>Jan 11</td>
<td>1</td>
<td>Introduction to mapping and GIS</td>
<td>Chapters: 1, 2.1</td>
<td>How to use a virtualized machine</td>
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<td></td>
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<td>Getting set up with ArcGIS</td>
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<tr>
<td>Jan 18</td>
<td>2</td>
<td>Spatial data models: vectors and rasters</td>
<td>Chapters: 2.3, 4</td>
<td>Complete Lab 1 tutorials</td>
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<tr>
<td>Jan 25</td>
<td>3</td>
<td>Measuring Earth: map scale,</td>
<td>Chapters: 2.2</td>
<td>Work on Lab 1</td>
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<td>Week of...</td>
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<td>Reading</td>
<td>Lab</td>
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<td>geodesy, and coordinate systems</td>
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<tr>
<td>Feb 1</td>
<td>4</td>
<td>Map projections</td>
<td>• Chapters: Review 2.2</td>
<td><strong>LAB 1 DUE</strong></td>
</tr>
<tr>
<td>Feb 8</td>
<td>5</td>
<td>Data classification</td>
<td>• Chapters: 5, 6.1, 6.3</td>
<td>Complete Lab 2 tutorials</td>
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<tr>
<td>Feb 15</td>
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<td><strong>Winter Break</strong></td>
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<td>Feb 22</td>
<td>6</td>
<td>Exam 1 and review</td>
<td></td>
<td><strong>Review Lab 1 results</strong></td>
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<td></td>
<td><strong>Work on Lab 2 data classification section</strong></td>
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<tr>
<td>Mar 1</td>
<td>7</td>
<td>Symbolization</td>
<td>• Chapters: 9.2</td>
<td><strong>Work on Lab 2 symbolization section</strong></td>
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<td>Mar 8</td>
<td>8</td>
<td>Spatial analysis</td>
<td>• Chapters: 6.2, 7, and 8</td>
<td><strong>LAB 2 DUE</strong></td>
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<tr>
<td>Mar 15</td>
<td>9</td>
<td>Automating spatial analysis: modeling and</td>
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<td><strong>Begin Lab 3 tutorials</strong></td>
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<td>programming</td>
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<td>Mar 22</td>
<td>10</td>
<td>Map design</td>
<td>• Chapters: 9.1, 9.3, and Ch. 1 from <em>Designing Better Maps</em> – available through Courserlink</td>
<td><strong>Work on Lab 3 modeling sections</strong></td>
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<tr>
<td>Mar 29</td>
<td>11</td>
<td>Webmapping</td>
<td>• See Courserlink</td>
<td><strong>LAB 3 DUE THURSDAY</strong></td>
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<tr>
<td>Apr 5</td>
<td>12</td>
<td>Exam 2 and review</td>
<td>• NO CLASS FRIDAY</td>
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<td>Apr 26</td>
<td></td>
<td>(Exam Period)</td>
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<td><strong>LAB 4 DUE</strong></td>
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**Lab sections**

Labs will be held *synchronously* via Microsoft Teams at the following times (Eastern):
- Monday - 1:30 to 3:20p - Mayah
- Tuesday - 8:30 to 10:20a - Mayah
- Tuesday - 9:30 to 11:20a - Nathan
- Thursday - 9:30 to 11:20a - Nathan
Lab sections are like open office hours with your TA. They will give a preview of the lab assignment, suggest tips and tricks, provide feedback on previous assignments, and help answer specific questions you may have. For more information, please see the “Geomatics Labs Code of Conduct” document.

Because lab sessions are TAs’ office hours, they will be limited in their ability to respond to emails outside of lab sessions.

You may attend any lab session; you are not required to attend the one you registered for. You can access the labs via the links posted on Courselink.

Lab assignments
Lab #1: Introduction to GIS through ArcGIS  
Due Feb 5 by 11:59pm

Lab #2: Classifying and Symbolizing Your Data  
Due Mar 12 by 11:59pm

Lab #3: Spatial Analysis and Automating Your Workflow  
Due Apr 1 by 11:59pm

Lab #4: GIS from Start to Finish (takehome final assignment)  
Due Apr 26 by 11:59pm

All labs should be submitted to the appropriate Courselink Dropbox. Late assignments will only be accepted without penalty with prior approval – please use the extension request form on Courselink. Otherwise, there may be a penalty of 10% of the assignment’s value per day (including weekend days).
A brief Q&A

Q: I have a question, who should I contact and how?
A: We’ve put together this flow chart to help you navigate who you should reach out to -

We will respond to your requests and questions as soon as we can. Please do not count on an immediate response, especially for important last-minute questions regarding assignments.

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 – please use the extension request form on Courselink. Lectures will be recorded and available through Courselink.

Q: I’m not happy about my exam or lab grade. Will you change it?
A: For regrades, we reserve the right to either increase OR decrease your grade depending on what we find in regrading.

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!
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 virtual 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.
University of Guelph Policy Statements

Disclaimer
Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings and academic schedules. Any such changes will be announced via CourseLink and/or class email. All University-wide decisions will be posted on the COVID-19 website and circulated by email.

Illness
The University will not require verification of illness (doctor's notes) for the fall 2020 or winter 2021 semesters.

E-mail Communication
As per university regulations, all students are required to check their <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
Courses that are one semester long must be dropped by the end of the last day of classes; two-semester courses must be dropped by the last day of classes in the second semester. The regulations and procedures for Dropping Courses are available in 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 promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway.
Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance, and not later than the 40th Class Day.

More information: [www.uoguelph.ca/sas](http://www.uoguelph.ca/sas)

**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.

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](http://www.uoguelph.ca/academiccalendars) are the source of information about the University of Guelph’s procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.