Instructor
Adam Bonnycastle, MSc
Geomatics Support Specialist, Dept. of Geography, Environment and Geomatics
Room 231A, H.L. Hutt Building (HUTT)
abonnyca@uoguelph.ca
519-824-4120 ext. 53097
Adam’s Office hours: Wednesdays, 2:30 pm – 4:30 pm

Graduate Teaching Assistants
• Mayah Obadia, Sections 1 & 2 (Monday & Tuesday labs), obadiam@uoguelph.ca
• Noah Singer, Sections 3 & 4 (Thursday labs), singern@uoguelph.ca

GTA Office hours: Lab sessions. TAs are limited in their ability to respond to emails, etc., outside of these times.

Prerequisite: 5.00 Credits

Public Health & COVID-19
(Adapted from Drs. Jaclyn Cockburn and Eric Nost)

It is our collective responsibility to ensure our classroom remains a safe and healthy environment for all of us. Strict compliance with all public health regulations set forth by the Government of Ontario, Wellington-Dufferin-Guelph Public Health, and the University of Guelph is required. Please be sure you are familiar with all of the University of Guelph COVID-19 Practices.

• If you, or someone in your household, is feeling ill, please do not come to campus. I will do the same if necessary. Please follow the most up to date rules on ‘self-isolation’ provided by the Government of Ontario. In the event of my own self-isolation or illness, there may be significant changes to the course based on what I am able to do under these conditions.

• We are beginning the semester completely online, until January 24th. If it becomes necessary to move this course completely online during the semester, I will communicate all changes via CourseLink and/or your UoG email. This course is not designed to be fully remote; there may be bumps and unforeseen challenges if the online period is extended.

• Upon the resumption of in-person learning activities on campus:
  o Students who do not comply with public health regulations will be asked to leave the class immediately. This includes, but is not limited to proper mask wearing (covering nose and chin). As long as a mask mandate is in place, you should limit eating and drinking in class. I will report breaches of public health regulation through various University channels (e.g. Student Conduct Support Coordinator, Chair of Department of Geography, Environment & Geomatics, Associate Dean (Academic) CSAHS, etc.).
  o If I deem there are significant or sustained breaches to public health regulations in the class, I may cancel classes or move them back to the online environment.
  o At any point during a class, you may stop the lecture to inform me of any breaches to public health. Simply raise your hand or stand up and let me know. You do not have to identify where or who.

• If you require a short-term accommodation due to COVID-19, please contact me as soon as possible. For longer or more complex accommodation, please contact Accessibility Services as soon as possible.
We strongly encourage you to familiarize yourself with Accessibility Services, your Academic Advisor office (e.g., BACO, BSc Advising etc.) and Health Services should you require their assistance during the semester.

**Expectations for Inclusivity & Online Behaviour**

(Adapted from Dr. Jaclyn Cockburn)

Different perspectives and lived experiences shape whom we are and make our communities stronger. I want everyone in our class to feel safe, feel that they belong and that their ideas, perspectives, and lived experiences are important. It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students’ learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.

We will not tolerate inappropriate online behaviour, examples of which include:

- Posting inflammatory messages about your instructor, TA and/or fellow students
- Using obscene or offensive language online
- Copying or presenting someone else’s work as your own
- Adapting information from the Internet without using proper citations or references
- Buying or selling term papers or assignments
- Posting or selling course materials to course notes websites
- Having someone else complete your quiz
- Completing a quiz for/with another student when collaboration is not permitted
- Stating false claims about lost quiz answers or other assignment submissions
- Threatening or harassing a student, TA and/or instructor online
- Discriminating against fellow students, instructors and/or TAs
- Using the course website to promote profit-driven products or services
- Attempting to compromise the security or functionality of the learning management system
- Sharing your username and password
- Recording lectures without the permission of the instructor

**Course Description**

**Overview**

This course introduces the use of 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 choose appropriate symbols for different data types and levels of measurement. We will also introduce basic tools for (automated) geoprocessing and highlight guidelines for effective map design.
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 and describe foundational concepts in geomatics, including data models, projection, scale, generalization, classification, symbolization, geoprocessing, and design.
2. Work independently with industry standard Geographic Information Systems (GIS) software to appropriately apply concepts and project, symbolize, analyze, and present data.
3. Critically evaluate data sources, analysis methods, and the advantages and disadvantages of GIS software.

Course Organization
- Three synchronous class meetings per week, Mondays, Wednesdays & Fridays, 9:30am – 10:20am.
  - Online until Jan. 24, or further notice from the University of Guelph. See class CourseLink page for details.
  - Room 113, MacNaughton Building (MACN), once we are back in-person.
  - In general, Mondays and Wednesdays are for lectures, while Fridays will be for reviewing previous quiz, demos/activities, guest lectures, etc.
- One synchronous two-hour lab session per week.
  - Online until Jan. 24, or further notice from the University of Guelph. Meeting times listed below; see class CourseLink page for details.
  - Room 231 or 236, H.L. Hutt Building (HUTT), once we are back in-person.
    - Section 1, Monday, 1:30 – 3:20 pm, HUTT 236
    - Section 2, Tuesday, 9:30 – 11:20 am, HUTT 231
    - Section 3, Thursday, 9:30 – 11:20 am, HUTT 231
    - Section 4, Thursday, 1:30 – 3:20 pm, HUTT 231

Rationale for in-person learning
After consulting with colleagues and listening to student feedback these past two semesters, I feel that technical computer-based courses, such as those for GIS/geomatics, benefit from in-person interaction. While online learning is certainly satisfactory, students have reported that they feel more engaged with the content when they can collaborate directly with other students, TAs, and their instructor. For example, live demonstrations in class, trouble-shooting inevitable hurdles on-the-fly during lab sessions, etc.

References
   In order to facilitate learning in this course, we will be using an open access textbook. A PDF copy is available to you free of charge via the link above, and you may view and read chapters online.
2. Course website - This course has an accompanying CourseLink website, accessible through University of Guelph webpage. This site includes printable .pdf files of certain course materials including copies of the PowerPoint slides used in class. However (!), do not expect the slides to cover all the material presented in class. The CourseLink site also includes a discussion board to facilitate communication between students.
Evaluation

- Laboratory Assignments, 60%
- Troubleshooting or Tutorial Post 5%
- Quizzes, 10%
- Final Exam, 25%: In-person, 2022/04/25, 7:00pm – 9:00pm, Location TBA

Laboratory assignments

(4 * 15% each = 60%)

These assignments are where you apply the knowledge that we are producing through readings and lectures. They are essential for building the technical skills you will need to take your geomatics training to the next level. The first three lab assignments each consist of:

- a set of technical tutorials,
- a series of applications, and
- written reflections.

The final assignment (#4) is a capstone focused on application and reflection (no tutorials).

Troubleshooting and Tutorial Post

(5%)

You are welcome and encouraged to use our CourseLink discussion board for general course-related questions. Starting in Week #3, over the course of the remaining semester, I ask that you make one of two specific types of posts to the board:

- a short post asking for help implementing one key GIS technique, or
- a brief tutorial explaining one key GIS technique to the rest of the class.

I will provide assignment details by the end of Week #2.

Quizzes

(Best 8 out of 10 * 1.25% each = 10%)

10 ‘weekly-ish’ quizzes, 10-15 questions each, to be completed via CourseLink. These relatively low-stakes quizzes will help keep you on track with the readings and lectures, and provide you with timely feedback. See CourseLink Calendar for quiz schedule.

Exam

(25%)

The final exam will consist of approximately 90 minutes worth of multiple choice, fill-in-the-blank, matching, short answer questions, or similar. You will have 2 hours to complete it. Questions will be inclusive of the entire course.
How to do well in this course

- Take care of yourself, and communicate with your instructor and TA about challenges that you are facing.
- Attend lectures, take notes, and engage with exercises.
- Do the readings and complete the weekly quizzes.
- Attend your lab sessions and complete the lab assignments. Lab sessions are generally for working on your assignments. While you will also need to work on these assignments outside of class time, these sessions are when you have access to your TAs to ask questions and receive help if you are stuck on something.
- Work through technical problems with the help of your classmates, TA, online forums, and myself.
- Ask questions if you are feeling stuck!! 😊

Lab Assignments

The laboratory material constitutes an integral part of this course and attendance at one lab session per week is mandatory. While TAs will not keep a formal attendance record, if a student does not attend a session it is their responsibility to contact other students regarding missed material. The final exam will include lab material.

Lab sessions will be online until Jan. 24th or further notice from the University, after which they will all be held in-person in Hutt Rms 231 and/or 236. During lab sessions, TAs will present an overview of each lab assignment, suggest tips and tricks, provide feedback on previous assignments, and help answer specific questions you may have. Lab sessions are TA office hours; they are limited in their ability to respond to emails outside of these sessions.

- Submit all labs to the appropriate CourseLink Dropbox.
- We will only accept late assignments without penalty with prior approval – please use the extension request form on CourseLink. Otherwise, there may be a late penalty of 10% of the assignment’s value per day (including weekend days).
- Students must provide and use their own method of backing up files (University OneDrive, USB memory stick, etc.). Lost files are not a valid reason for handing in a late assignment.
- Students may attend lab sessions other than their own with the permission of the TA for that lab session. Students officially registered for a lab session always have first priority.

Lab assignment schedule

- Lab 01: Introduction to GIS through ArcGIS Pro
  - Due Feb. 4th by 11:59pm
- Lab 02: Classifying and Symbolizing Data
  - Due Mar 11th by 11:59pm
- Lab 03: Spatial Analysis and Automating your Workflow
  - Due Apr 1st by 11:59pm
- Lab 04: GIS from Start to Finish
  - Due Apr 8th by 11:59pm
Tentative Schedule
Attendance at lectures and lab sessions is mandatory. While TAs and myself do not keep formal attendance records, if a student misses a class it is their responsibility to contact another student to find out what material they missed.

<table>
<thead>
<tr>
<th>Week Number</th>
<th>Lecture Topics (subject to change)</th>
<th>Readings</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Jan 10th</td>
<td>Course overview; Introduction to Cartography; Introduction to GIS</td>
<td>Chapters 1 &amp; 2.1</td>
<td>Getting set up with ArcGIS Pro</td>
</tr>
<tr>
<td>2. Jan 17th</td>
<td>Spatial data models: vectors and rasters</td>
<td>Chapters 2.3, 4 &amp; 6.2</td>
<td>Complete Lab 1 tutorials</td>
</tr>
<tr>
<td>3. Jan 24th</td>
<td>Measuring the Earth: map scale, geodesy, and coordinate systems; hand-out troubleshooting/tutorial post assignment</td>
<td>Chapters 2.2</td>
<td>Work on Lab 1</td>
</tr>
<tr>
<td>4. Jan 31st</td>
<td>Map Projections</td>
<td></td>
<td>Lab 1 due, Feb 4th by 11:59pm!</td>
</tr>
<tr>
<td>5. Feb 7th</td>
<td>TDB</td>
<td></td>
<td>Complete Lab 2 tutorials</td>
</tr>
<tr>
<td>6. Feb 14th</td>
<td>Data classification</td>
<td>Chapters 5, 6.1 &amp; 6.3</td>
<td>Complete Lab 2 data classification section</td>
</tr>
<tr>
<td></td>
<td>Feb 21st</td>
<td></td>
<td>Wwwwwwwwwwwwwwwinter Break © (No classes)</td>
</tr>
<tr>
<td>7. Feb 28th</td>
<td>Symbolization</td>
<td>Chapter 9.2</td>
<td>Complete Lab 2 symbolization section</td>
</tr>
<tr>
<td>8. Mar 7th</td>
<td>Spatial Analysis I</td>
<td>Chapters 6.2, 7 &amp; 8</td>
<td>Lab 2 due, Mar 11th by 11:59pm! Begin Lab 3 tutorials</td>
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<tr>
<td>9. Mar 14th</td>
<td>Spatial Analysis II</td>
<td></td>
<td>Complete Lab 3 spatial analysis sections</td>
</tr>
<tr>
<td>10. Mar 21st</td>
<td>Automating spatial analysis: modelling and programming</td>
<td></td>
<td>Complete Lab 3 modelling sections</td>
</tr>
<tr>
<td>11. Mar 28th</td>
<td>Map design and use</td>
<td>Chapters 9.1 &amp; 9.3 Chapter 1, Designing Better Maps.</td>
<td>Lab 3 due, Apr 1st by 11:59pm!</td>
</tr>
<tr>
<td>12. Apr 4th</td>
<td>Course review</td>
<td></td>
<td>Lab 4 due, Apr 8th by 11:59pm!</td>
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University of Guelph Policy Statements

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
All course drops are to be completed by the dates specified in the Undergraduate Calendar Chapter III – Schedule of Dates. Courses that are one semester long must be dropped by the end of the last day of classes. 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 make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

More information is available at the Accessibility Services website.

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 outlined in the Undergraduate Calendar.

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. This includes graphic elements of map design. Each student must create their own digital files for computer-based exercises.

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.

Disclaimer
Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via Courselink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 Information website and circulated by email.

Illness
Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment).

COVID-19 Safety Protocols
For information on current safety protocols, follow these links:

- Return to Campuses: How U of G is preparing for your safe return
- Return to Campuses: Classroom Spaces

Please note, that these guidelines may be updated as required in response to evolving University, Public Health or government directives.