Intro to Geomatics & GIS
GEOG 2232
Fall 2024 Lakehead University
Department of Geography and the Environment
Class & lab location: OA 1022

Course instructor: Megan Sheremata, Assistant Professor, Department of Geography and the Environment/Department of Geology

Office: OR 1037 (in Residence building)
Drop-in Office hours: Wednesdays 11AM – 11:45 AM
Additional office hours: By appointment

For appointments please use email: msherema@lakeheadu.ca
Note: email should only be used to schedule appointments – use office hours for questions about absences and course content.

Class Location:
Lecture: Mon and Weds from 12:30 to 1:30 PM
Lab: Weds 4:00-5:30 PM

Welcome to GEOG 2232! In this course we will study principles and techniques of geomatics, primarily by working within Geographic Information Systems (GIS) to make traditional maps of spatial phenomena and places. Geomatics is a field concerned with spatial data. More specifically, it encompasses the practices involved in the 1. collection, 2. organization and 3. visualization of geographic/spatial data.

Many people still think of GIS as simply a map-mapping platform. But GIS are database platforms for spatial data that enable us to do many things. We can make maps, 3-D models, create apps, and tell multi-media stories in GIS.

While there is an emphasis on computer technologies in geomatics, the fundamentals of mapping and geographic literacy are key to GIS. Making maps is a complex design process that influences how others experience the physical world. So in this course we will introduce basic cartographic principles, and examine key ethical dimensions of mapping.

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. Define and apply foundational concepts in geomatics when working with geospatial databases and producing maps and other geographic models.
2. Work independently in Geographic Information Systems (GIS) to project, symbolize, analyze, and present geodata.
3. Apply cartographic principles in map design and to critically evaluate geospatial data sources, methods, and tools.

Textbook

Mastering ArcGIS Pro ISE, 2nd Ed. 2022. Maribeth Price. McGraw-Hill Canada.

Make sure to purchase the textbook by the second week of class.

Purchase the 2nd ISE edition from MCGraw Hill Canada (Print or digital edition) with **access to Canadian Companion Connect**, which has essential exercises leveraging Canadian datasets. https://www.mheducation.ca/mastering-arcgis-pro-ise-9781265127718-can-group

Evaluation

Lab Assignments (6 equal weight) 40%

- In lab assignments student will apply ideas from readings and lectures. The first three lab assignments each consist of:
  - Technical tutorials in lab
  - Independent work
  - Written reflections

Note: some labs will be multi-week lab assignments

- Independent Project to be assigned during week 8 lecture #2 30%
  This is a three-part independent project focused on application of course concepts and lab techniques:
  1. Draft maps will be assessed by peer critique. Due Week #10 (10%)
  2. Students will submit a final critique of maps of the maps of their peers in Lab #10 (10%)
  3. Revised maps and a presentation how the map addresses the peer critique will be presented in the final lab (10%)
- Midterm exam to be held during lab session of week 9 20%
- Attendance/participation in lecture and lab 10%

Readings

Readings will be assigned every week. Usually they follow the chapters sequentially in the text. However, some weeks an additional reading on cartography will be assigned and posted on D2L.

We cannot cover all of the concepts in detail in class, so it is essential that you read chapters before each lab.

For the midterm you will be expected to understand and define each of the Important Terms in each of the chapters assigned and to answer the chapter review questions for exams.

For the final presentation of your map, you should demonstrate knowledge of the terms and skills taught in lab which are all found in the course readings, in addition to following the assignment guidelines.

How to do well in this course

- Attend all lectures and labs, take notes and ask questions to help guide your note taking, and write out important terms for each week.
- Do the readings the week before lab
- Work with your peers and support each other
- Attend all lab sections and complete the lab assignments on time
- Ask questions when you're feeling stuck!
- Take care of yourself, and communicate with your instructor about the challenges you are facing
- If you are concerned about any aspect of your academic program: make an appointment with a program counsellor in your degree program.
- If you are struggling with personal or health issues:
    - Make an appointment with me before you miss classes or labs if possible
    - Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance: https://www.lakeheadu.ca/students/wellness-recreation/student-healthand-wellness/health-services/orillia

- If you have a documented disability:
    - Student Accessibility Services (SAS) can provide services and support for students with a documented learning or physical disability. They can also provide information about how to be tested for a learning disability. For more information see: https://www.lakeheadu.ca/students/studentlife/student-services/accessibility

Other course policies

Office hours – Office hours will be held weekly on Wednesdays from 11-11:45 AM. Appointments are recommended for other days – just send me an email.

Email – Please avoid emailing questions that can be answered in lecture slides or the syllabus. If you email the professor, always use your LU email and include the course code as the subject line so that I know which of my classes you are emailing about. For lengthy questions, accommodations, absences and sensitive matters, only email to make an appointment to discuss the situation during office hours.

Other guidelines – Appreciate that we are all teachers and learners, each with a unique life experience and distinct prior knowledge. Discuss, email, and listen with a spirit of respect for peers and those outside of class who pertain to the discussion.

Group work/collaboration – The weekly assignments are individual work, not group work. You may discuss concepts and questions in class and lab, but you must each perform your labs independently.

Late assignments – Generally late assignments are only accepted with pre-approval, unless in exceptional circumstances. When these arise please email for an appointment to discuss your situation. Do not email any personal details about your life.

Format - All lab and lecture sections will be held in-person and all sessions are mandatory.

Late work - All labs should be submitted to the appropriate D2L Dropbox unless otherwise noted. Late assignments will only be accepted without penalty with prior approval. Otherwise, there may be a penalty of 10% of the assignment's value per day (including weekend days).

Missed exams – In only exceptional circumstances a make up may be arranged. However, the student must email the course instructor as soon as possible to meet to discuss face-to-face the situation before a make-up can be approved.

Attendance – Missing more than five lectures can result in a failing grade as per university policy. Additionally, students must attend the lab sessions. If you miss a lab due to illness or other situation, discuss the situation in-person with the lab instructor during office hours.

Schedule (See D2L for assigned readings)

Week #	Lecture Topic	Lab activity and reading assignment
1	Introduction to maps and mapping fundamentals	Read Chapter 1

2	Essential map elements, map evaluation, map audience and map purpose	Lab 1 Part 1: Sketch mapping
3	The power of maps: critical dimensions of maps and ethics in mapping	Lab 1 Part 2: Sketch mapping
4	Mapping from 3D to 2D	Lab 2: Intro to ArcGIS Pro Reading: Ch 1 and 2
5	Coordinate systems	Lab 3: Mapping GIS Data Readings: Ch 3 & 4
6	Vector and Raster Data	Lab 4: Managing Vector Data Readings: Ch 6 & 7
		Reading Week
7	Data classification and symbolization	Lab 5: Digitizing, Georeferencing and editing data Reading: Ch 8
8	Participatory mapping	Midterm (20%) on topics from weeks 1-7 *Independent projects assigned*

9	Spatial Queries	Tutorial: Spatial queries Reading: Ch 9
10	Map Evaluation	Independent Projects (10% of final mark) Due Monday Nov 18th at 5PM. Map critique in lab (10%) due by Thursday Nov 21 at 5PM.
11	Spatial Analysis	Tutorial: Spatial queries Reading: Ch 10
12 & 13	The cartographic process from idea to final map	Revised Map Presentations (10%). Revised Maps due Nov 26 at 5PM/ Presentations on Nov 27 and Mon Dec 2 (attendance compulsory)