

Maps, Satellites and the Geospatial Revolution, GEOM 1004-B

Carleton University
Department of Geography & Environmental Studies
Winter 2023

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INTRODUCTION

Introduction to the creation and use of maps using a variety of geospatial tools to better understand and resolve physical, social, and environmental problems. Overview of geomatics (cartography and map design, geographic information systems, GPS, and remote sensing). The main learning objectives are to: (1) to become familiar with the core sub-disciplines in the broad field of geomatics, (2) to develop an appreciation for how geospatial tools are used, and how they are shaping the way we make decisions, and (3) to develop practical, hands-on skills in cartography, GPS mapping, GIS analysis, and remote sensing and to learn how they can be used to help solve social and environmental problems.

Precludes additional credit for GEOM 2004 (no longer offered).

COURSE FORMAT

Lectures will follow the attached course outline. The schedule may require minor revisions to accommodate unexpected scheduling issues. The lectures will introduce and illustrate the major concepts in geomatics. Support material will be available on the Brightspace course site.

SCHEDULE

Lectures: Tuesday 2:35pm- 4:25pm in Southam Hall 518

Lab sessions: - section B01: Tuesday 8:35am-10:25am in Loeb Building A200
- section B02: Monday 11:35am-1:25pm in Loeb Building A200
- section B03: Thursday 2:35pm-4:25pm in Loeb Building A200

Note: Labs will run in the following order: B02→B01→B03

COURSE TEACHING ASSISTANTS

Check Brightspace for TA contact information and office hours.

RECOMMENDED TEXTBOOK

Jonathan Campbell and Michael Shin, 2011. Essentials of Geographic Information Systems. Saylor Foundation Brady, N.C. Open access textbook available on:
<https://www.saylor.org/site/textbooks/Essentials%20of%20Geographic%20Information%20Systems.pdf>

STUDENT RESOURCES AND COMMUNICATION

Virtual Office Hours, Email and Appointments

If you have questions pertaining to lecture materials, I encourage you to come to my office hours or to ask me your questions at the end of class or make an appointment for a meeting.

All questions about missed assignments, missed exams, and other practical concerns about the course should be directed to me by email. Emails will be responded to during business hours only. Please place the course number GEOM1004 in the subject line. Private correspondence with the Instructor and Teaching Assistants should be through a Carleton email account (this is accessible in Brightspace).

Brightspace Course Site

The Brightspace course site of GEOM 1004 contains information on all aspects of the course. It includes partial outlines of lectures (not complete notes) and graphs or diagrams presented in class. You need to supplement these notes by attending the class lectures. You will be able to access Brightspace course site and to download files on the first week of classes. If you are not able to login, please contact the course instructor.

EVALUATION

Final marks in the course are based on your performance in five categories as follows:

Lecture Participation Questions	10%
Midterm Exam I	15%
Lab assignments/Exercises	30%
Midterm Exam II	15%
Lab Exam	15%
Story Map Project	15%

Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean.

Lecture Participation Questions

To encourage and enable active student participation in lectures, this course requires the use of the iClicker app to answer the lecture participation questions.

Setting up iClicker Account:

1-Create your iClicker Reef account: Go to <https://student.iclicker.com/#/login> or download the iClicker free application on your smart device then select sign up option.

2- Sign up for a 14-day iClicker Reef free account. You should use your university email address and your Carleton University ID in the Student ID field. After the 14-day trial period, you have to pay for subscription (\$19.50 for a six-month subscription).

3- Search with the following information to find this course and **add** it to your iClicker account:

Institution: Carleton University

Course: GEOM1004: Maps, Satellites and the Geospatial Revo

Lab exercises

There will be six lab assignments. The lab exercises are meant to complement the course materials and to facilitate application and integration of knowledge gained from lectures and readings. The lab exercises will be posted on Brightspace at least one day ahead of their corresponding lab session. These are normally due at the beginning of your lab section, two weeks after the assignment introduction. Please feel free to collaborate with others during the lab sessions to obtain common data, but please submit your own individually written lab reports that contain your own analyses and answers to questions. Lab assignments must be typed. The assignment reports must be received by the start of the lab period of the day on which they are due. Late lab submissions will be penalized by -10% of the maximum assignment grade. Weekends count as 2 days. Only extenuating circumstances such as an acute health problem, accident, or family emergency will be considered as a valid reason to extend the deadline without penalty.

Midterm Exams

Exams will take place on **January 30th and March 27th** during the regularly scheduled lecture periods. Exams will cover lecture materials. Only students who have made prior arrangements with the instructor,

or students who have contacted the instructor within 5 days of the missed midterm exam with a valid doctor's note explaining why they missed the exam will be permitted to write the make-up exam.

Lab Exam

This will happen the week of **March 27th** during your laboratory session. It will involve a 90-minute computer-based test in which you will answer multiple-choice and short answer questions and you will be required to use mapping software to come up with some of your answers.

Story Map

[ArcGIS Story Maps](#) is an online platform for communicating engaging topics through maps, photos and written content. Over the course of the semester, you will be working on your own individual story map during lab work periods. The specific topic will be up to you (e.g. documenting a recent trip you did, your favourite coffee shops/pubs around Ottawa, an "homage" to the neighbourhood you grew up in, or a story map that documents a social/environmental issue of interest). You will receive additional guidelines early in the term. Your final story maps will be submitted through ArcGIS online.

COURSE POLICIES

Late Assignments

Late assignments will be penalized by subtracting 10% per day (including Saturday and Sunday) of the total value of the assignment. Students are also encouraged to directly connect with the course instructor to discuss required accommodations arising from the COVID-19 situation.

Students whose assignments are late because of a valid medical reason or family emergency will not be penalized, however, documentation from a family physician or counseling services will be required.

Missed Assignments or Quizzes

Students are advised to complete the [self-declaration form](#) available on the Registrar's Office website to request academic accommodation for missed course work including exams and assignments. Students are also encouraged to directly connect with the course instructor to discuss required accommodations arising from the COVID-19 situation. Students who are not able to write the final exam during the exam period must consult with *Exam Services* as soon as they are aware that they will miss the test.

Standards of Written Work

Any assignment submitted should be printed using *word processing software* and checked for spelling and grammar. The overall presentation quality of the assignments will be reflected in your grade.

PANDEMIC MEASURES

It is important to remember that COVID is still present in Ottawa. The situation can change at any time and the risks of new variants and outbreaks are very real. There are [a number of actions you can take](#) to lower your risk and the risk you pose to those around you including being vaccinated, wearing a mask, staying home when you're sick, washing your hands and maintaining proper respiratory and cough etiquette.

Feeling sick? Remaining vigilant and not attending work or school when sick or with symptoms is critically important. If you feel ill or exhibit COVID-19 symptoms do not come to class or campus. If you feel ill or exhibit symptoms while on campus or in class, please leave campus immediately. In all situations, you should follow Carleton's [symptom reporting protocols](#).

Masks: Masks are no longer mandatory in university buildings and facilities. However, we continue to recommend masking when indoors, particularly if physical distancing cannot be maintained. We are aware that personal preferences regarding optional mask use will vary greatly, and we ask that we all show consideration and care for each other during this transition.

Vaccines: While proof of vaccination is no longer required to access campus or participate in in-person Carleton activities, it may become necessary for the University to bring back proof of vaccination requirements on short notice if the situation and public health advice changes. Students are strongly encouraged to get a full course of vaccination, including booster doses as soon as they are eligible and submit their booster dose information in [cuScreen](#) as soon as possible. Please note that Carleton cannot guarantee that it will be able to offer virtual or hybrid learning options for those who are unable to attend the campus.

All members of the Carleton community are required to follow requirements and guidelines regarding health and safety which may change from time to time. For the most recent information about Carleton's COVID-19 response and health and safety requirements please see the [University's COVID-19 website](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact covidinfo@carleton.ca.

ACADEMIC INTEGRITY

Academic integrity is a necessary foundation for all meaningful scholarly activity and verified instances of intellectual dishonesty will be dealt with in full accordance with the procedures laid out in Academic Integrity Policy. Additional information regarding what constitutes plagiarism may be found on Carleton University web site: <https://carleton.ca/secretariat/wp-content/uploads/Academic-Integrity-Policy-2021.pdf> The University Senate defines plagiarism as "presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one's own." This can include:

- reproducing or paraphrasing portions of someone else's published or unpublished material, regardless of the source, and presenting these as one's own without proper citation or reference to the original source;
- submitting a take-home examination, essay, laboratory report or other assignment written, in whole or in part, by someone else;
- using ideas or direct, verbatim quotations, or paraphrased material, concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another's data or research findings;
- failing to acknowledge sources through the use of proper citations when using another's works and/or failing to use quotation marks;

Plagiarism is a serious offence which cannot be resolved directly with the course's instructor. The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of "F" for the course.

ACADEMIC ACCOMMODATION

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Pregnancy obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: <http://www.carleton.ca/equity/>

Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: <http://www.carleton.ca/equity/>

Academic Accommodations for Students with Disabilities: The **Paul Menton Centre** for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your **Letter of Accommodation** at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (*if applicable*) at <http://www.carleton.ca/pmc/new-and-current-students/dates-and-deadlines/>. You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at <http://www.carleton.ca/equity/>

Survivors of Sexual Violence: As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/equity/sexual-assault-support-services>

Students representing Carleton University, Ontario or Canada (at academic or sports events): I fully support students involved with organizations and teams that travel during the semester; however, with this privilege comes additional responsibility. You are responsible for providing formal documentation identifying the organization you represent and potential schedule conflicts with this course. In the event that you are travelling and unable to attend an exam, you must schedule a secondary exam before you depart. Without proper documentation, a missed exam will earn zero points.

Maps, Satellites and the Geospatial Revolution (GEOM1004)-B
Winter term 2023 Course Outline

Week	Lecture Class	Lab	Readings
Jan. 9-12	Course Introduction Introduction: Maps, Satellites, and the Geospatial Revolution	<i>NO LAB</i>	Preface Ch. 1
Jan. 16-19	Thinking spatially – Key Concepts Earth models, Coordinate Systems and Projections	Intro to Google Earth Pro and ArcGIS Pro software Lab Assignment #1 Introduction to Google Earth Pro	Ch. 1 Ch. 2 (40-48)
Jan. 23-26	Earth models, Coordinate Systems and Projections (cont'd) Global Navigation Satellite Systems	Lab Assignment#2: Mapping Nunavut communities <i>Assignment #1 is due</i>	Ch. 2 (40-48) Ch. 2 (49-60)
Jan. 30-Feb. 2	Jan. 30th: Midterm Exam I- During our Regular Class Period.	Lab Assignment#2: Mapping Nunavut communities (cont'd). <i>Assignment #1 is due</i>	
Feb. 6-9	Jeff Hughes and Bryan Ladds ESRI Canada-Guest lecture on ArcGIS online platform <i>Handing Back Midterm Exam I</i>	Introduction to Avenza Maps for GPS data acquisition Lab Assignment #3: GNSS data collection and accuracy assessment. <i>Assignment #2 is due</i>	
Feb. 13-16	An Introduction to Cartographic Design Principles <i>StoryMap Project Guidelines</i>	Lab Assignment #3 GNSS data collection and accuracy (cont'd) Work on story map project)	Ch. 9
Feb. 20-23	<i>NO CLASS – WINTER BREAK</i>	<i>NO LAB – WINTER BREAK</i>	
Feb. 27-March 2	Introduction to Geographic Information Systems (GIS)	Lab Assignment #4 – Symbolizing raster and vector data. <i>Assignment #3 is due</i>	Ch. 7
March 6-9	Spatial Analysis Using GIS	Lab Assignment #5. Examining spatial data and spatial relationships. <i>Lab Assignment #4 is due</i>	Ch. 8
March 13-16	An Introduction to Aerial Photography and Remote Sensing	Lab Assignment #5. Examining spatial data and spatial relationships (cont'd) Work on Story Map Project	Ch. 4.3
March 20-23	An Introduction to Aerial Photography and Remote Sensing (con't)	Lab Assignment #6: Introduction to raster GIS analysis remote sensing Work on Story Map Project. <i>Lab Assignment #5</i>	Ch. 4.3
March 27-30	March 27th: Midterm Exam II- During our Regular Class Period.	Lab Exam	
Apr. 3-6	Handing back Midterm Exam II and Discussing the Answer Key Discussing the Lab Exam Work on Story Map Project.	Lab Assignment. #6: Introduction to raster GIS analysis remote sensing (cont'd) Work on Story Map Project.	
Apr. 10-12	<i>NO CLASS.</i> Work on Story Map Project.	<i>NO LAB.</i> Work on Story Map Project. <i>Both Lab Assig. #6 and Story Map project due by midnight on Sunday, April 18th via Brightspace upload.</i>	