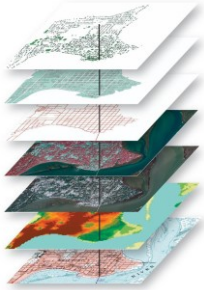
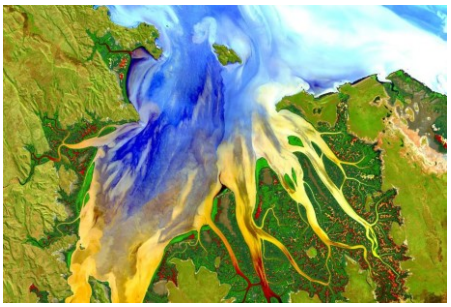
Maps, Satellites and the Geospatial Revolution (GEOM 1004)

Fall 2020

Department of Geography and Environmental Studies, Carleton University



Professors: Murray Richardson, PhD
Office: Room B355, Loeb Building
Office hours: Via Big Blue Button on cuLearn (Date and Time TBA)
Contact: murray.richardson@carleton.ca

Lectures: Mondays, online, as follows :

Section A1: 2:35 pm to 3:05 pm
Section A2: 3:10 pm to 3:40 pm
Section A3: 3:50 pm to 4:20pm

Laboratory periods:

Section A1:	Wednesdays	11:35 am to 1:25 pm
Section A2:	Thursdays	11:35 am to 1:25 pm
Section A3:	Thursdays	2:35 pm to 4:25 pm

Teaching Assistants: TBA. See cuLearn at start of term for TA contact information and office hours.

I. Course Description:

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, remote sensing).

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

III. Learning Outcomes:

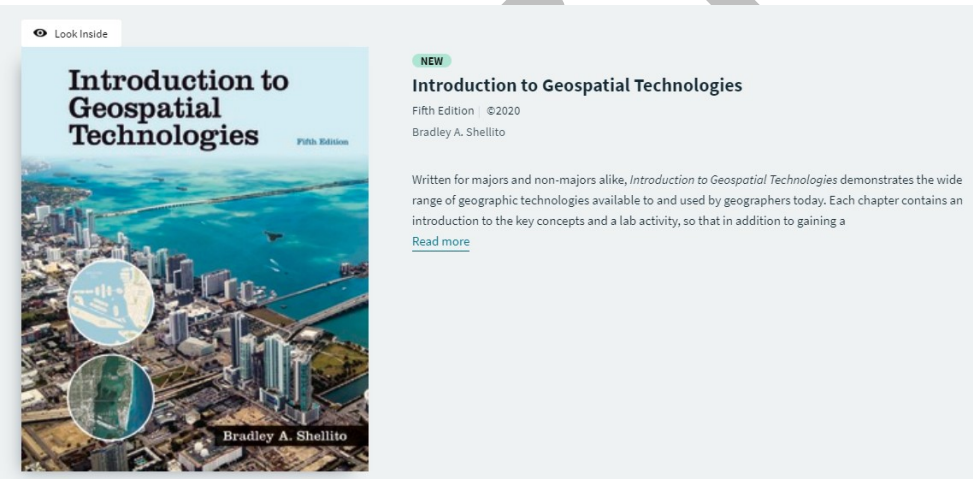
- To become familiar with the core sub-disciplines in the broad field of geomatics, including

cartography, global positioning system applications, geographic information systems, and remote sensing.

- To develop an appreciation for how geospatial tools are used, and how they are shaping the way we make decisions.
- To develop practical, hands-on skills in cartography, GPS data collection and mapping, introductory GIS analysis, and introductory remote sensing and to learn how they can be used to help solve social and environmental problems.

IV. Textbook:

We will use the following textbook by Bradley Shellito (must be 5th edition) extensively throughout the course and it is considered mandatory for all students (available online as e-book purchase or rental, and in hardcopy at Haven's Bookstore in Ottawa):



A detailed explanation of the required readings will be posted on cuLearn on a week-by-week basis. Weekly quizzes will be based on assigned readings from this textbook and other online sources.

V. Course Calendar: Please refer to the last page of this course outline for details. The schedule may require minor revisions to accommodate unexpected scheduling issues.

VI. Course Evaluation:

Students will be evaluated on the basis of five components:

Geospatial Laboratory Assignments (6):	50%
Weekly Online Quizzes:	20%
Final Lab exam:	15%
ESRI Story Map Project:	15%
Total:	**100%**

Geospatial Laboratory Assignments: There will be six lab assignments in total. ***These are normally due on Sunday night by 12 am, for all sections.*** Assignments submitted after the due date will be considered

late and will be penalized by -10% of the maximum assignment grade.

Weekly online quizzes: Online quizzes ("open book") will be based on assigned course readings from the textbook and other resources. They must be completed prior to the online lecture meeting date that follows the week in which they were assigned. You will have a set amount of time to complete each one. Once you start a quiz, you must complete it in the same session.

Laboratory Exam: This will happen the week of November 16th during your online 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 Project: *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.

Purpose of Lectures, Readings and Assignments:

The lectures, readings, and laboratory sessions and assignments are designed to complement and reinforce each other in meeting the course's learning objectives. Class lectures provide the fundamental structure for the course, including the presentation of key concepts and issues, case studies, audiovisual material, and additional content not found in the textbook. The required readings in the textbook provide an overview of course topics, further examples, and additional material not addressed in class lectures. The laboratory assignments provide the opportunity to apply key methods and concepts introduced in the lectures and readings. An understanding of both class lecture material and required readings are needed to complete each weekly quiz and geospatial laboratory assignment successfully.

Online Laboratory Sessions and Assignments:

The geospatial laboratory assignments provide an opportunity to apply course concepts and get hands-on experience using geomatics tools. Assignments will be introduced during the online laboratory sessions by your teaching assistant and /or the course instructor, which usually includes a brief review of relevant course material, software demonstrations, and tips on how to successfully complete the assignment. While the assignments have been designed by the instructors, the TAs are primarily responsible for organizing and running the laboratory sessions, for providing assistance during their office hours, and for grading assignments. Please seek assistance as needed, but keep in mind that their role is to facilitate learning and not to provide answers.

Assignment Scheduling and Due Dates

There are six laboratory assignments required for this course. All assignments must represent individual work that is completed independently. Any form of plagiarism will be treated as a serious instructional offence in accordance with university policy (see below).

Students should come to lecture and laboratory sessions having done the required readings and ready to participate in discussions. Please bring your textbook and class notes to laboratory sessions.

The introduction, explanation and submission of laboratory assignments will adhere to the schedule at the end of this outline. *Please note that there will be no laboratory session the first week of class* - your first laboratory session will be during the week of September 14th on Thursday or Friday depending on which laboratory section you are in. Please review the class schedule below carefully, and check the due dates specified on the assignment handouts. The topic associated with a laboratory assignment will be introduced through the class lecture and required readings. Next, the assignment will be explained in the laboratory session. Finally, students will be expected to submit their completed assignments in accordance with the assigned due dates. Please be sure to carefully note the due date that is specified in the assignment handout.

Please refer to details regarding laboratory assignments and other laboratory activities provided in the course schedule below.

Submission and Grading of Assignments

Laboratory assignments must be submitted by the *beginning* of your laboratory sessions. Assignments submitted on the correct day but after the laboratory session will be considered one day late. The penalty for late assignments is a ***10 percent*** per day past the assigned due date (including weekend days), unless accompanied by appropriate documentation such as an official medical note. Medical notes must specify the period of illness. To avoid penalty, the circumstances of a late assignment must be discussed in person or by email with your TA within three days of your return to campus. There are no exceptions to this late policy. In accordance with the Undergraduate Calendar, December 7th, 2017, is the *final* day to submit assignments.

VII. Instructional and Conduct Offences

Carleton University has clear and firm policies regarding instructional and conduct offences. Instructional offences include among other activities cheating, contravening examination regulations, plagiarism, submitting similar work in two or more courses without prior permission, and disrupting classes. Conduct offences apply in areas of discrimination and sexual harassment. Further information about the University's Academic Integrity Policy can be found at:
http://www2.carleton.ca/studentaffairs/academic-integrity.

Plagiarism is one kind of instructional offence. Examples of plagiarism include:

- Reproducing or paraphrasing portions of someone else's published or unpublished material, and presenting these as one's own without proper citation or reference to the original source;
- Submitting an 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;
- Failing to acknowledge sources through the use of proper citations when using another's works

and/or failing to use quotation marks;
- Handing in "substantially the same piece of work for academic credit more than once without prior written permission of the course instructor in which the submission occurs."

For more information on how to cite sources, refer to the library web page "*Citing Your Sources*" available at http://www.library.carleton.ca/help/citing-your-sources. Plagiarism is a serious offence which cannot be resolved directly with the course instructor. The Associate Deans of the Faculty conduct 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 include sanctions ranges from a grade of zero for the assignment to suspension from your program of study.

Submit the original copy of your assignment to your TA, but please always *keep your own copy* of submitted assignments until after final grades have been posted for the course. For written answers to questions in the assignments, use complete sentences that demonstrate your ability to convey ideas in a clear and grammatically correct manner. Each assignment must be typed and should have a header with a title, your name, your student number, the course number, your teaching assistant's name, and the date of submission. TAs will mark the assignments and post grades on the course's CuLearn site. Students are responsible for checking their assignment grades on CuLearn. Any questions regarding assigned grades must take place in written form (i.e., email) ***within 10 days*** after the day that the assignments are returned in the laboratory. Students who fail to meet the above-outlined course requirements may be assigned an FND grade. Final grades are subject to the Dean's approval.

Late assignments are strongly discouraged, but can be submitted through the drop-box slot located at Room B342 of the Loeb Building. ***The name of the professors and your TA must be on the cover of your assignment***. In addition, you must also follow the drop-box policy:

- Send an email to your TA, with a copy of your assignment attached, immediately after you drop the original paper copy of your assignment in the drop box.
- It is your responsibility to follow-up with your TA if needed to ensure that your email/assignment has been received.
- The paper copy of your assignment in the drop box will be the version used for marking purposes; the emailed copy will be used for verification purposes. The date when materials submitted through the drop-box is not recorded, so sending the assignment as an email attachment is very important to ensure that the correct late penalty is applied.
- Always put the name of your professors and your TA on assignments submitted through the drop box.
- If the drop-box policy is not followed, the assignment will be marked as being received the day it is picked up from the drop-box, which could be one or more days after the actual submission.

Midterm Tests Policy:

The midterm tests will be carried out in our regular lecture classroom and timeslot. If a student misses a mid-term test for a legitimate and unforeseen reason (e.g., illness) and appropriate documentation is provided (with contact information that allows for verification) a make-up exam will be rescheduled. This will only occur if the proper official medical or other applicable documentation is provided, and which

indicates the specific date or time period when a student is not able to participate in academic activities. Accommodations will be considered for students who are incapacitated or otherwise unable to take part in academic activities on the day of the mid-term and/or the day before. In all other cases, students are expected to write the mid-term tests. If inadequate documentation is provided, the resulting grade for a missed mid-term will be zero. The final exam will be scheduled during the formal examination period by Examination Services. For any questions concerning the scheduling or procedures for the final exam, please consult their web page (http://www2.carleton.ca/ses/exams/).

Academic Accommodation:

You may need special arrangements to meet your academic obligations during the term. 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/. 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.

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.

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). Requests made within two weeks will be reviewed on a case-by-case basis. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (if applicable).

Please note – if you do not meet with your instructor to discuss your letter of accommodation we cannot guarantee your required accommodation. *It is your responsibility to approach one of us about this.*

You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at http://www2.carleton.ca/equity/.

Campus Resources for Students

Student Experience Office http://www2.carleton.ca/seo/
Health and Counselling Services http://www.carleton.ca/health
International Student Services Office http://www.carleton.ca/isso
Academic and Career Services http://www.carleton.ca/sasc

COURSE SCHEDULE, GEOM 1004, Fall 2018 (*details of the required readings will be posted on cuLearn*). Note that each class week begins with the lecture, followed by a laboratory meeting later in the week, depending on when your own section is held.

Week	Date/Week of	Lecture topic (Wednesdays)	Laboratory session (Date/Time depends on section)
0	Sep 9	No lecture this week	No labs this week
1	Sep 14	Course Introduction: Maps, satellites and the geospatial revolution	Introduction - Using Google Earth and GPS
2	Sep 21	Thinking spatially and Introduction to Geospatial Technology	Supervised Work Period – complete lab 1 assignment (due this Sunday midnight)
3	Sep 28	Earth models and Georeferencing	Lab Assignment #2. Mapping Nunavut communities
4	Oct 5	Earth models and Georeferencing (cont.) Jeff Hughes ESRI Canada guest lecture on ArcGIS online platform	Supervised Work Period – complete lab 2 and begin Story Map Project
	Oct 12	Earth models and Georeferencing (cont.)	Lab Assignment #3. Mapping bike rack usage with GPS and ArcGIS collector
5	Oct 19	No lecture (Statutory Holiday)	Supervised Work period – complete lab 3 and work on Story Map Project
	Oct 26	***Reading Break – No Classes***	
6	Oct 29	Global Navigation Satellite Systems	Lab Assignment #4. Examining spatial data and spatial relationships
7	Nov 2	Introduction to geographic information systems (GIS) and spatial data structures	Work Period – complete lab 4 and work on Story Map Project
8	Nov 9	Introduction to spatial querying and GIS operations	Lab Assignment #5 – Symbolizing raster and vector data
9	Nov 16	Introduction to cartography and cartographic design	***Laboratory exam during regular lab periods***
10	Nov 23	An introduction to remote sensing (RS)	Lab Assignment #6 Introduction to Raster GIS analysis and RS
11	Nov 30	Introduction to digital terrain analysis	*Supervised online work Period*
12	Dec 7	Introduction to UAS technology and applications	*Lab 6 and Story Map project due by midnight on Friday, Dec 11th via cuLearn upload. Supervised online work Period*
13	Friday Dec 11	Friday December 11th follows a Monday schedule, but there will	

Please note that lecture topics and assignment details are subject to change at the discretion of the instructor.