

Maps, Satellites and the Geospatial Revolution (GEOM 1004)

Department of Geography and Environmental Studies, Carleton University, Summer 2021



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Office hours: Monday 14-15
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Lectures: Mondays and Wednesdays 12:05-13:55

Laboratory sections: **A1:** Mondays and Wednesdays 18:05-19:55
A2: Mondays and Wednesdays 15:05-16:55

Teaching Assistants: TBD

Calendar 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).

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

Course Objectives:

- 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 mapping, GIS analysis, and remote sensing and to learn how they can be used to help solve social and environmental problems.

Required Textbook:

Jensen, John R., and Ryan R. Jensen (2012). *Introductory Geographic Information Systems*. Prentice Hall Series in Geographic Information Systems. Toronto: Pearson Education Canada.

The textbook is available at Haven Books (43 Seneca St., 613-730-9888). You can also “rent” an e-book for 180 days for about \$50. For this option, go to CourseSmart at “www.coursesmart.com” and follow the directions. The ISBN for the eBook is 9780321675736. You will need to use a credit card (please note that you will be charged in US dollars). A copy of the textbook will also be on reserve at the library for loans of up to two hours.

Note: A detailed explanation of the required readings (including both textbook and some additional reading material) on a week-by-week basis will be posted on cuLearn during the first week of class.

Course delivery format:

Both lectures and laboratory sessions of this course would be delivered online. The weekly lectures will be offered synchronously through **BigBlueButton** platform. An access portal will be given on CUlearn every week. You can join the lecture by clicking on “Join session” button.

The lab assignments instruction will be given asynchronously as pre-recorded videos and will be posted on CUlearn prior to each lab session. Synchronous lab sessions will be held using **BigBlueButton** platform on CUlearn for question and answer and more clarification on potential issues that may rise up.

Please note that the sudden switch to online learning creates potential privacy problems that we never had to worry about in the past. When we do synchronous video calls and we have cameras on, we are opening windows into our homes. Please respect that fact with all your fellow students and instructors. Do not record people without their permission, and do not distribute recordings that we make available to anyone outside of the course. Remember, it’s not just the course materials any more, now it is also recordings of what was said and seen and shown by all of your classmates. If you have any concerns about privacy, don’t hesitate to bring them up with us.

Some of you have already made us aware of potential problems with uniformly participating in the synchronous portions of this course. Due to the practical nature of much of what we will cover, it will be very difficult or impossible to successfully participate completely asynchronously in this course. At the same time we recognize there will be challenges and will work with you to provide flexibility. Some of this will likely involve the recording of synchronous sessions. We ask all students to provide permission for these recordings, under the conditions outlined above, i.e. that the recordings only be used for the purposes of reviewing or getting caught up while taking this class.

Computing requirements:

[The computing requirement](#) of this course is ESRI ArcGIS Pro. You can download a one-year student license through the [GIS library website](#). Follow the instruction to install the software on your computer. If you have any questions or technical problems regarding downloading and installing ArcGIS Pro on your machines email GIS@carleton.ca. Please note that ArcGIS Pro is not supported on Mac operating system. For the system requirements of the software please check [here](#).

Due to the COVID-19 situation, physical access to the DGES GIS lab is not possible, while, remote access to the lab computers is now enabled using VMware Horizon Client. Instructions on how to login to the virtual machines through VMware Horizon Client is given [here](#). Please note that VMware Horizon Client is the new Virtual Desktop Infrastructure (VDI). VDI allows you to access campus computers and labs to use software already installed on the virtual machine without needing to download the software onto your own machine. You should not be downloading software onto the virtual machine – you do not have the privileges to do so.

This course depends largely on a progression of practical exercises, with skills building upon each other across assignments using the software. **It is your responsibility to ensure that you have the system requirements of the software AND/OR you can access remotely to the DGES GIS lab computers.** If you have any questions or concerns in that regard please talk to your instructor or TAs early in the semester. In addition, you must practice careful file management (saving files in the proper directories, deleting all unwanted files, naming files thoughtfully, and keeping track of where everything is) at all times, especially when remoting in to the GIS lab computers. Instruction on file management will be given in the introductory lab session.

Course Evaluation:

Students will be evaluated on the basis of five components:

Laboratory Assignments:	60%
Two Midterm tests:	25%
Final Lab exam:	15%
Total:	100%

Laboratory Assignments: There will be six assignments in total. These are normally due 1 week after the lab period in which they are distributed. The assignment reports must be received by the start of the lab period of the day on which they are due.

Midterm tests: These will take place on CULearn during the regularly scheduled lecture periods. You will receive further guidance on these tests during lecture.

Laboratory Exam: This will happen on CULearn 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.

Course Schedule – See last page of this course outline for details. The schedule may require minor revisions to accommodate unexpected scheduling issues.

Required Readings – Required weekly readings will be posted on cuLearn and will consist of pages from the textbook or other supplemental material, typically from online resources.

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 assignment successfully.

The midterm exams will include material from the required readings and class lectures, including audio-visual materials. Course content that is exclusive to the laboratory sessions will not be included in the exams. A **cuLearn** web site for this course has been made for students. Here you can access the course outline, lecture slides, assignment grades, occasional announcements, and contact information and office hours for the instructors and teaching assistants (TAs). To log in, go to cuLearn at <https://cuLearn.carleton.ca/>. Lecture slides will be posted on cuLearn for your reference following each lecture. Please note that lecture slides provide only a *partial* summary of the lecture material presented in class. Past experience indicates that class attendance has a significant impact on scores on the mid-term and final exams.

Laboratory Sessions and Assignments:

Laboratory assignments provide an opportunity to apply course concepts and get hands-on experience using geomatics tools. Assignments will be introduced during laboratory sessions by your teaching assistant, which usually includes a brief review of relevant course material and tips on how to successfully complete the assignment. While the assignments have been designed by the instructors, the TAs are 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, which are all of equal weight. 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).

The introduction, explanation and submission of laboratory assignments will adhere to the schedule at the end of this outline. Please review the class schedule carefully, and check the due dates specified on the assignment handouts. The topic affiliated with a laboratory assignment will be introduced in 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 on page 8.

Submission and Grading of Assignments

Laboratory assignments must be submitted on CULeran via the assigned submission portals before the lab 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 by email with your instructor.

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.

Midterm Tests Policy:

The midterm tests will be carried out through CuLearn during our regular lecture 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.

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.

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 us 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://www2.carleton.ca/equity/>.

Religious obligation: write to us 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://www2.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 us your Letter of Accommodation at the beginning of the term, and **no later than two weeks before** the mid-term exam or any assignment requiring accommodation (*if applicable*). After requesting accommodation from PMC, meet with your instructor to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled final exam at <http://www2.carleton.ca/pmc/new-and-current-students/dates-and-deadlines/>.

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.* Accommodations for the final examination, however, will be managed by examination services.

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>

Student Academic Success Centre <http://www.carleton.ca/sasc>

COURSE SCHEDULE, GEOM 1004, Summer 2021 (details of the required readings will be posted on cuLearn).

Week	Date	Lecture topic	Laboratory session (TBD)
1	July 5	Introduction: Maps, satellites and the geospatial revolution	
2	July 7	Thinking spatially – key concepts	
3	July 12	Earth models, Coordinate Systems and Projections georeferencing and the global positioning system (GPS)	
4	July 14	An introduction to geographic information systems (GIS)	
5	July 19	An introduction to cartography	
6	July 21	Midterm Exam 1 for first half of lecture Spatial Queries	
7	July 26	Spatial analysis using GIS	
8	July 28	Spatial analysis using GIS (con't)	
9	August 4	An introduction to aerial photography and remote sensing	
10	August 9	Guest Lecturer-TBA	
11	August 11	Midterm Exam 2 During Lecture	
12	August 16	Guest Lecturer-TBA	Laboratory exam during regular lab periods

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