

**GEOM 2007A**  
**Points, Lines and Polygons**  
**Department of Geography and Environmental Studies**  
**Faculty of Arts and Social Sciences**

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**Instructor:** Niloofar Alavi

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**Lecture:** Monday 17:35-19:25

**Laboratory:** Monday: 19:35-21:25

Tuesday: 17:35-19:25

**Office hours:** TBD

**TA:** TBD

**Brightspace course page link:** TBD

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## 1. Course Description

This course introduces vector geospatial data and geographic information systems (GIS) tools for managing, analyzing, and presentation of vector spatial information. You will learn both conceptual and practical aspects of working with vector GIS data and tools, and how to compile and work with spatial databases. Storage, visualization, manipulation and analysis of vector geospatial data. Vector geoprocessing including buffering, overlays and topological analysis; feature classification and cartographic representation; managing coordinate reference systems for vector layers; selected applications of vector GIS such as urban planning, environmental and resource management and socio-economic mapping.

## 2. Preclusions

Prerequisite(s): GEOM1004 or permission of the Department

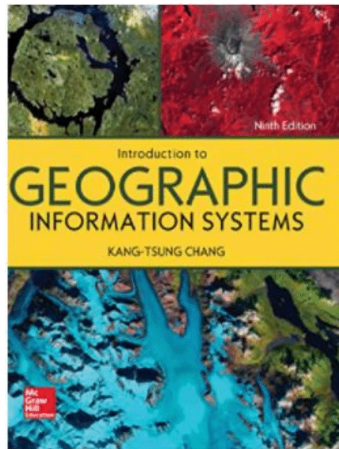
## 3. Learning Outcomes

- a. Understanding the theory and application of vector GIS data structures including concepts and techniques related to vector geospatial database systems (feature creation/editing, storing, querying).
- b. Gaining the foundational knowledge and skills required for intermediate vector geoprocessing including site suitability analysis using vector geoprocessing tools and network analysis.
- c. Understanding the types of problems that can be solved using vector-GIS analysis and be proficient with designing and implementing vector-based GIS problem solving workflows for spatial decision support.
- d. Be proficient with several different GIS software tools for manipulating, analyzing and mapping vector features and their attributes for intermediate geospatial analysis.

## 4. Texts & Course Materials

### Textbook:

This course has a mandatory textbook, available through the Carleton University Bookstore:



*Price: \$86 in Amazon*

### **Computing requirements:**

The computing requirement of this course is ESRI ArcGIS Pro 3.1. You can download a one-year student license through the [GIS library website](#). Follow the instructions 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](mailto:GIS@carleton.ca). Please note that ArcGIS Pro is not supported on the Mac operating system.

The DGES GIS lab is available for students 24/7 (unless another class is going on). In addition, remote access to the lab computers is 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 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. 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.

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.

## 5. Course Calendar

- Please refer to the tentative course schedule at the end of this document.

## 6. Evaluation

### *a. List of Evaluation Elements*

Grade evaluation will be based on these components:

**Lab assignments (4):** 40% (10% each)

**Written term test:** 30%

**Final project:** 30%

- **Lab assignments:** There will be four assignments in total, each worth 10%. The lab assignments are meant to complement the course materials and to facilitate application and integration of knowledge gained from lectures and readings. The lab assignments will be posted on Brightspace at least one day ahead of their corresponding lab session. 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 and submitted via the submission portal provided on Brightspace. **To request an extension, contact Niloofar 48 hours before the assignment due date. Late assignments will be penalized by -2% of the maximum assignment grade per day up to 7 days.**

Assignment submission should follow a technical lab report guideline, normally including the following sections: "Introduction and Purpose"; "Methods"; "Results and Discussion"; "Conclusion"; and "Bibliography". A title page is not required provided you have included your name, student number and section (e.g. A1) at the top of the first page or in a multi-page header. Please submit your reports in MS Word or PDF format. Tables and figures must have appropriate captions (Table 1; Figure 1). Table captions appear above the table. Figure captions appear below. References to tables in figures must precede the appearance of the actual table or figure in the document, and should be numbered according to the order in which they appear. It is incredibly important to learn how to write technical reports and to clearly and professionally communicate work flows/results/interpretations; This is the fundamental purpose for having you submit your assignments as well-formatted lab reports. Your report writing will be assessed as part of your grade for each assignment.

- **Written Term Test:** On the last day of the course during the lecture there will be a multiple-choice written test on theoretical course contents.
- **Final Project:** During the second half of term, you will be working on individual final projects, producing interactive electronic map-based presentations. Examples of past projects will be discussed in class. You will use ArcGIS Pro software to produce the electronic maps. The thematic data that can be used in your projects are available in the GIS library. You need to submit a project proposal mid semester, which

makes up 10% of the total grade for your final project. You will submit all the files needed for a working map project, as well as a written report. The final project makes up 30% of your final grade. This grade is based on your project proposal, the final project report as well as electronic files.

## 7. Carleton Academic Integrity

**Plagiarism is a serious offence and will not be tolerated.** “The University Academic Integrity Policy defines plagiarism as *“presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one’s own.”* This includes 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. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn from include but are not limited to books, articles, papers, literary compositions and phrases, performance compositions, chemical compounds, artworks, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, material on the internet and/or conversations.

Examples of plagiarism include, but are not limited to:

- any submission prepared in whole or in part, by someone else, including the unauthorized use of generative AI tools (e.g., ChatGPT)
- using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment
- using another’s data or research findings without appropriate acknowledgement
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one’s own
- failing to acknowledge sources with proper citations when using another’s work and/or failing to use quotations marks.”

You will often be working collaboratively to prepare for an assignment and possibly even to collect data, but **you must ALWAYS submit individual course work**. This means that every assignment **must be written and submitted individually**, demonstrating your **personal understanding and interpretation of the assignment content**.

Plagiarism is a serious offence that cannot be resolved directly by the course’s instructor.

The Associate Dean of the Faculty follows a rigorous [process for academic integrity allegations](#), including reviewing documents and interviewing the student, when an instructor suspects a violation has been committed. Penalties for violations may include a final grade of “F” for the course.

Carleton’s Academic Integrity Policy covers all these expectations and more, and is available at <http://www2.carleton.ca/studentaffairs/academicintegrity>

## 8. Academic accommodation:

Carleton is committed to providing academic accessibility for all individuals. You may need special arrangements to meet your academic obligations during the term. The accommodation request processes, including information about the *Academic Consideration Policy for Students in Medical and Other Extenuating Circumstances*, are outlined on the Academic Accommodations website ([students.carleton.ca/course-outline](https://students.carleton.ca/course-outline)).

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 see the Student Guide.

**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 see the [Student Guide](#).

**Academic Accommodations for Students with Disabilities:** The Paul Menon 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](mailto: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.

Carleton's [Academic Integrity Policy](#) states that "instructors at both the graduate and undergraduate level have the responsibility to provide clear guidelines concerning their specific expectations of academic integrity (e.g. rules of collaboration or citation) on all course outlines, assignment and examination material."

Your unit may provide you with a standard Academic Integrity statement for your syllabus or you may craft your own. Statements must be consistent with the University's Academic Integrity Policy when it comes to definitions, processes, and rules.

## 9. Student Mental Health

As a student you may experience a range of mental health challenges that significantly impact your academic success and overall well-being. If you need help, please speak to someone. There are

numerous resources available both on- and off-campus to support you. For more information, please consult <https://wellness.carleton.ca/>

Here is the list of some of the resources available regarding mental health:

#### **Emergency Resources** ([on and off campus](#))

- Suicide Crisis Helpline: call or text 9-8-8, 24 hours a day, 7 days a week.
- For immediate danger or urgent medical support: call 9-1-1

#### **Carleton Resources**

- Mental Health and Wellbeing: <https://carleton.ca/wellness/>
- Health & Counselling Services: <https://carleton.ca/health/>
- Paul Menton Centre: <https://carleton.ca/pmc/>
- Academic Advising Centre (AAC): <https://carleton.ca/academicadvising/>
- Centre for Student Academic Support (CSAS): <https://carleton.ca/csas/>
- Equity & Inclusivity Communities: <https://carleton.ca/equity/>

#### **Off Campus Resources**

- Distress Centre of Ottawa and Region: call 613-238-3311, text 343-306-5550, or connect online at <https://www.dcottawa.on.ca/>
- Mental Health Crisis Service: call 613-722-6914 or toll-free 1-866-996-0991, or connect online at <http://www.crisisline.ca/>
- Empower Me Counselling Service: call 1-844-741-6389 or connect online at <https://students.carleton.ca/services/empower-me-counselling-services/>
- Good2Talk: call 1-866-925-5454 or connect online at <https://good2talk.ca/>
- The Walk-In Counselling Clinic: for online or on-site service <https://walkincounselling.com>

*Tentative course schedule*

<i>Week</i>	<i>Date</i>	<i>Lecture</i>	<i>Textbook reading</i>	<i>lab</i>
1	Week of Jan 6	Introduction		Introduction
2	Week of Jan 13	Earth models, projection and coordinate system	Chapter 2	Assignment 1 starts
3	Week of Jan 20	Guest lecturer from GIS library	Chapter 5 & 7	Assignment 1 continues
4	Week of Jan 27	Vector data input and editing	Chapter 11 & 18	Assignment 1 due Assignment 2 starts
5	Week of Feb 3	Vector data operations and GIS models		Assignment 2 continues
6	Week of Feb 10	Database management and attribute data	Chapter 8 & 10	Assignment 2 due Assignment 3 starts
	Week of Feb 17	<b>Reading Week</b>		
7	Week of Feb 24	Effective cartography	Chapter 9	Assignment 3 continues <b>Project proposal due</b>
8	Week of Mar 3	Spatial Analysis		Assignment 3 due Assignment 4 starts
9	Week of Mar 10	Network Analysis	Chapter 17	Assignment 4 continues
10	Week of Mar 17	3D Analysis-Guest lecturer		Assignment 4 due Working on final projects
11	Week of Mar 24	<b>Term test</b>		Working on final projects
12	Week of Mar 31	GIS customization-Model Builder-Coding in GIS-Guest lecturer		Working on final projects
13	Week of Apr 7	<b>No lecture</b>		Working on final projects
	Apr 26	<b>Final project due</b>		