GEOM 3005: Geospatial Analysis

Winter 2026 Course Outline

Department of Geography and Environmental Studies - Carleton University

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Instructor:	Scott Mitchell	Email:	Scott.Mitchell@carleton.ca
		Office:	Loeb A330
		Office Hour:	Tuesdays, 11h30-12h30
TAs:	Owen Kirkham		OwenKirkham@cmail.carleton.ca
	Office hours by appointment		

Lectures: Mondays, 12h35-14h25
Labs: Tuesdays, 08h35-11h25

This is an **in-person** course. If you are required to miss class due to illness, please contact the instructor as soon as possible to get guidance on how to participate from home as best possible if you are well enough to continue with some course activities, and/or how to get caught up in any case.

Please consult Brightspace for more information (link will only work for enrolled students).

I. Course Description

An advanced course in geospatial analysis theory and practice; geoprocessing; geo-visualization; geostatistics; spatial modelling; working with spatio-temporal data structures; advanced site-suitability, network analysis, and spatial databases.

II. Preclusions: None

III. Learning Outcomes: By the end of this course, students will be able to:

- Critically evaluate spatial analysis tools

- Perform spatial analysis operations in GISystems with special attention to parameters
- Design and execute spatial analysis projects
- Find, manipulate, and use appropriate open data

IV. Texts: All documentation and course materials will be provided as needed through Brightspace. There are no definitive texts which will suit all purposes. Readings are taken from a variety of sources, any GIS-related texts are useful.

V. Course calendar (some lecture dates and topics subject to change):

Week	Lectures (Monday)	Lab (Tuesday)
1. Jan 5,6	Class set-up / Recap of basic concepts	Lab 0.1: Boot Camp
2. Jan 12,13	Distance Operations	Lab 1: Autocorrelation
3. Jan 19,20	Interpolation	Lab 1 Contd.
4. Jan 26,27	Kriging	Lab 2: Interpolation
5. Feb 2,3	Kriging Contd.	Lab 2 Contd.
6. Feb 9,10	Multi-Criteria Decision Analysis	Lab 3: Kriging
Winter Break (Feb 16-20)		
7. Feb 23,24	Spatial Social Network Analysis	Lab 4: MCDA
8. Mar 2,3	Analysis using Spatial Databases	Lab 5 PostGIS
9. Mar 9,10	Analysis using Spatial Databases	Lab 5 Contd.
10. Mar 16,17	Overflow / work on Challenges	Scott available online for Challenge chats
11. Mar 23,24	Dedicated time to work on Challenge (in-class consultations)	Scott available online for Challenge chats
12. Mar 31 – 6	Dedicated time to work on Challenge (in-class consultations)	Scott available online for Challenge chats
13. Apr 8	**CHALLENGE REPORT DUE**	

VI. Evaluation:

- Boot Camp ("Lab 0.1"): 5%
- Labs
    - Lab 1: 15%
    - Lab 2 and 3: 10% each
    - Lab 4 to 5: 15% each
- Challenge Report: 25%
- Participation: 5%

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.

Late Policy: All submissions are online at BrightSpace. No late assignments will be accepted , with the exception of medical issues/illness or if you have already arranged for an academic accommodation as described in subsequent sections of this syllabus. In such cases you must make arrangements with the course instructor at least 24 hours prior to the due date. It is your responsibility to ensure that the instructor or TA receive your submitted hard copies. If you are unable to submit an assignment in Brightspace, it is recommended that you email the instructor or TA with a copy. However, this option should only be considered as a last resort.

Lecture/Lab attendance : Lab and Lecture attendance is required to succeed in this course. However, remember that attendance does not guarantee participation grades. Participation grades are based on interactions in class.

Use of generative artificial intelligence:

Most of the work you will be evaluated on in this course cannot be achieved with AI tools, but you will be submitting written lab reports. Students may use AI tools for basic word processing functions, including grammar and spell checking (e.g. Grammarly, Microsoft Word Editor, Copilot), but all of the original content you are submitting must be generated by you. It is not necessary to document the use of AI for the permitted purposes listed above. If you have questions about a specific use of AI that isn't listed above, please consult your instructor / teaching assistant. This policy ensures that student voices and ideas are prioritized and authentically represented, maintaining the integrity of the work produced by students while allowing basic support to enhance clarity, correctness, layout and flow of ideas. The goal of adopting a limited use of AI is to help students develop foundational skills in writing and critical thinking by practicing substantive content creation without the support of AI.

As our understanding of the uses of AI and its relationship to student work and academic integrity continue to evolve, students are required to discuss their use of AI in any circumstance not described here with the course instructor to ensure it supports the learning goals for the course.

PLAGIARISM:

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; and
- failing to acknowledge sources through the use of proper citations when using another's work and/or failing to use quotations marks.

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.

Statement on 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/

Requests for Academic Accommodations:

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).