DALHOUSIE UNIVERSITY

ENVS-ERTH-BIOL-SCIE-GEOG 4850 | GIS Research Project
Winter 2026
GIS Research Project

Instructor: Dr. Amy Mui (amy.mui@dal.ca)
Office Hours: Click HERE to make a virtual booking with me
Course TA: Rori Mulholland (rmulholland@dal.ca)
GIS Support : Jen Strang (jen.strang@dal.ca), GIS Centre, Killam Library

	DAY	TIME	LOCATION
Lectures:	Fri	8:35-11:25pm	LSC 3111

Course Description

Students learn how to design, manage, and complete a research project in Geographic Information Science (GIS). Projects must include a substantive analytical component where GIS is central to methods employed. Evaluation includes a written report, oral presentation and digital data. Required for completion of the Certificate in GIS.
Course Prerequisites: ENVS/ERTH/GEOG 3500
Co-Requisite: ERTH/GEOG 4250
Exclusions: Restricted to 3rd and 4th year students.

Course Objectives/Learning Outcomes

After successfully completing this course, students will be able to;
- Conduct an independent GIS-focussed research project from experimental design and data collection to analysis and interpretation of results
- To apply critical thinking skills to problems in the spatial domain
- Develop skills in disseminating research through web-based GIS platforms

Course Format & Online Platforms

Three hours are assigned to this course per week but we will not always use the entire time together. Windows of time may be allotted to group work, one on one consultations with myself or Jen Strang, or as supported open work time. Keep the three hours open for this course and do not make other commitments, but we will use the time in various ways.

Online Platforms | A combination of web-based platforms and in-class time to share materials and facilitate a community of support and camaraderie. You will need to lean on each other for the best chance of success in this course!
- BRIGHTSPACE: All assignment instructions, grades, and primary announcements will be posted here
- LSC 3111: In-person classes will be held here (this is the new computer lab on the 3rd floor)
- MS TEAMS: Occasional online 1:1 meetings will be held here
- PADLET: This will be used to get to know each other and share research ideas

Course Materials

Readings | There is no required textbook for this course. Reading materials will be provided in class in digital form on the course Brightspace site or from the reserve desk at the Killam Library. The course syllabus, updates, announcements, assignments, and other relevant information will be posted to the Brightspace page.

Course Assessment

Component	Weight
Project Preparation (45%)	
Brainstorm	10%
Workflow Design	10%
Proposal Chat	10%
CATS (Problem-Solving Sets x 3)	15%
Research Project (45%)	
Annotated Bibliography	10%
Final Research Presentation	15%
Story Map Design	20%
Other (10%)	
Participation	10%

Assignments: There are *three assignments* which address different components of a research project and provide the opportunity to practice and obtain feedback on essential skills. Assignments are completed individually and will often need to be completed outside of class time depending on how quickly you work. Submission is electronically through the Brightspace course website on the due date by the end of the day (11:59pm). See 'Important Notes' section for policy on late assignments.

Assignment 1 – Brainstorm – Develop TWO tangible ideas for your research project and search for available data for each. Describe the problem, identify your data needs, and outline the solution using the template discussed in class.

Assignment 2 – Project Proposal – don't stress! Prepare a few slides and speak informally about your project idea. You should be close to narrowing down your topic but be open to suggestions and ideas from the class. Feedback is critical during the research process.

Assignment 3 – Flowchart – Finalize your topic selection and create a methods flowchart. Provide a breakdown of the proposed analytical tools along with examples of its use in other geospatial problem-solving contexts.

CATS (Creative Anaylsis and Trouble-Shooting Sets) – a series of short problems are presented to you. Try and solve them in groups during class time. These CATS will give you a taste of the creativity needed to complete your own projects. And who doesn't love cats?

Research Project: The research project is the focus of this course. Individuals will choose a topic of interest, collect/acquire the necessary spatial data, and apply analytical methods within a GIS framework. The proposal will include a summary of the proposed research including methods and a literature review. A short and very informal proposal discussion with the class will help to foster the exchange of ideas among peers and an annotated bibliography will help to build foundational knowledge. Final presentations will be given in class and each student will create an ESRI story map to highlight their research and share with potential employers. Details to be discussed in class.

Participation: Assessment is through participation in the class padlets, supporting your peers, and engaging with the community. Details will be provided in class.

Course Content (Schedule)

Date		Class Activity	Due Dates
Jan	9	**Skills Assessment, Class Polling, Sample GIS Exercise** *EXERCISE: Measuring Habitat Fragmentation*	Weekly Padlet
	16	**Brainstorming Research Ideas**	Weekly Padlet
	23	**RQ Development & Open Data**	
	30	**Spatial Tools & Workflows**	**Assignment 1 DUE:** *Check Brightspace for date*
Feb	6	***MUNRO DAY* No Class**	**Assignment 2 DUE:** *Check Brightspace for date*
	13	**Proposal Discussions**	**Assignment 3 (In-Class)**
	20	Winter Study Break (keep up the research momentum!)	
Mar	27	**CATS 1** Research project work time	
	6	**CATS 2** Research project work time	
	13	**CATS 3** Research project work time†	
	20	Research project work time†	
	27	Research project work time†	
Apr	3	**GOOD FRIDAY, NO CLASS**	
	8	**Final Presentations, Location TBD** (2nd last class)	
	9	**Final Presentations, Location TBD** (last class of term) **	
		Final Exam Period (Apr 11-27)	**STORY MAPS DUE**

† Work time may be in-class, online, or via scheduled on.e-on-one meetings
* Bring excerpts of your final report to me for early feedback (optional)

IMPORTANT NOTES:

• This schedule is tentative and may change slightly depending on class interests and time available. The syllabus will be updated accordingly and posted on Brightspace.

• All course materials will be posted on Brightspace - please login to the site regularly. In order to receive timely notifications, please **sign-up to receive immediate text or email notifications** when new course announcements appear. You can do so by clicking on your name in the top right corner of Brightspace > select *Notifications* > under *Instant Notifications* check "Announcements – new announcement available".

- View important dates including deadlines for adding/dropping courses here: https://www.dal.ca/academics/important_dates.html

- Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale:

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (<50)
A- (80-84)	B- (70-72)	C- (55-59)	

Course Policies

Class culture: We aim to cultivate a culture of mutual respect, inclusiveness, and collective curiosity. Be courteous of your neighbours, engage in discussion, and speak up if you are struggling (if you're having a great time, speak up as well! ;)

Late penalties: Assignments handed in on the due date will be evaluated at 100% of their potential score. Late assignments will be subject to a late penalty of 15% per day (including weekends). Assignments submitted 7 calendar days past the due date will be assigned a zero. Assignments handed in AFTER the work has been returned to the class cannot be marked for credit.

Missed Exam: Students must provide notification prior to the start of the exam if they cannot write the final exam. Cases will be reviewed individually to determine if a missed final assessment will be replaced by (a) a make-up exam offered on another date, (b) an alternate assignment in lieu of the exam or (c) a re-weighting of already assessed components.

Student Declaration of Absence: The new Student Declaration of Absence (SDA) Form will be used in this course and will replace sick notes for absences of three days or fewer that result in missed or late academic requirements. The form can be accessed through Brightspace or submitted to me via email. **Submission does not provide automatic exemption from any academic requirements that were missed or late during an absence**. Any alternate coursework arrangements for missed or late academic requirements are at the discretion of the course instructor. **Students must also email the instructor prior to the due date if a deadline is going to be missed.**

Plagiarism: Plagiarism and cheating is a serious academic offense and includes the submission or presentation of the work of another as if it were one's own. Failure to acknowledge someone else's words, phrases, ideas, recording, images, code, results, lecture content, term paper, or assignment responses may result in a failing grade or, if very serious, suspension or expulsion from the university. Please visit https://www.dal.ca/dept/university_secretariat/academic-integrity/plagiarism-cheating.html for more information.

Student Collaboration: Given the move to virtual teaching this term, it is encouraged that students work together to provide support, collaboration, and to build lasting friendships. Discussing course content and sharing results is appropriate but providing answers to an individual that has not conducted the work themselves is not. Each student must submit their own work. Copying from another, even small passages of text is strictly discouraged and would fall under the umbrella of plagiarism.

University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Missed or Late Academic Requirements due to Student Absence

As per Senate decision instructors may not require medical notes of students who must miss an academic requirement**, including the final exam**, for courses offered during fall or winter 2020-21 (until April 30, 2021). Information on regular policy, including the use of the Student Declaration of Absence can be found here: **https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html.**

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity. **Information**: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia). **Information**: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution. **Code**: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness **Statement**: http://www.dal.ca/cultureofrespect.html

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca). **Information**: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)

https://www.dal.ca/academics/important_dates.html

University Grading Practices

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Student Resources and Support

Advising
  General Advising https://www.dal.ca/campus_life/academic-support/advising.html
  Science Program Advisors: https://www.dal.ca/faculty/science/current-students/academic-advising.html
  Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html
  Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html
  International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports
  Library: https://libraries.dal.ca/
  Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html
  Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html
  Copyright Office: https://libraries.dal.ca/services/copyright-office.html
  Fair Dealing Guidelines https://libraries.dal.ca/services/copyright-office/fair-dealing.html

Other supports and services
  Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html
  Student Advocacy: https://dsu.ca/dsas
  Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety
  Biosafety: https://www.dal.ca/dept/safety/programs-services/biosafety.html
  Chemical Safety: https://www.dal.ca/dept/safety/programs-services/chemical-safety.html
  Radiation Safety: https://www.dal.ca/dept/safety/programs-services/radiation-safety.html

Scent-Free Program: https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html