



ENVS-ERTH-BIOL-SCIE-GEOG 4850

Winter 2023

GIS Research Project

Instructor: Dr. Amy Mui (amy.mui@dal.ca)
Office Hours: Click [HERE](#) to make a virtual booking with me
Course TA: Caitlin Cunningham (Caitlin.Cunningham@Dal.Ca)
GIS Support : Jen Strang (jen.strang@dal.ca), GIS Centre, Killam Library

| | DAY | TIME | LOCATION |
|------------------|-----|--------------|-----------|
| Lectures: | Mon | 11:35-2:25am | LSC B2012 |

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 B2012: In-person classes will be held here.
- MS TEAMS: Occasional online 1:1 meetings will be held here
- PADLET: This will be used to solicit participation and give relief from the rigours of your GIS projects!

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 course Brightspace page.

Course Assessment

| Component | Weight |
|----------------------------------|--------|
| Project Preparation (40%) | |
| Open Data Search | 8% |
| Proposal (oral) | 10% |
| Workflow Design | 10% |
| CATS (Problem-Solving Sets) | 12% |
| Research Project (50%) | |
| Final Research Presentation | 15% |
| Final Research Report | 25% |
| Story Map Research Projects | 10% |
| 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 – Project Proposal Brainstorming – 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(s). 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 – Project Flowchart – Select one of your project ideas and create a flowchart. Provide a breakdown of the proposed analytical tools along with examples of its use in other geospatial problem-solving contexts.

CATS (Creative Analysis 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 type of 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. Final presentations will be given in class and research reports submitted by the end of term before the exam period ends. 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. These are meant to help build a sense of community where you feel comfortable leaning on each other for support. Topics on the padlets are generally un-related to GIS! This is a space for fun, inspiration, and a few laughs!

Course Content (Schedule)

| Date | Class Activity | Due Dates |
|-------------------------------|--|---|
| Jan | 9 Skills Assessment, Class Polling, Sample GIS Exercise <i>EXERCISE: Measuring Habitat Fragmentation</i> | Weekly Padlet |
| | 16 Brainstorming Research Ideas Online presentation from NPRI, Clarisse Fisset <i>WORKSHOP: Estimating Sea Level Rise (time permitting)</i> | Weekly Padlet |
| | 23 RQ Development & Open Data <i>WORKSHOP: TBD</i> | Weekly Padlet |
| | 30 ESRI Rep Jonathan Van Dusen <i>GUEST WORKSHOP: Date and topic to be confirmed</i> | Assignment 1 DUE: <i>Check Brightspace for date</i> |
| Feb | 6 Jen Strang, GIS Analyst, GIS Centre (Killam Library) <i>WORKSHOP: Using Python to build workflows</i> | Weekly Padlet |
| | 13 Proposal Discussions (IN-CLASS) <i>WORKSHOP: Feature Extraction from Raster Data</i> | Assignment 2 DUE: In-class |
| | 20 Winter Study Break | |
| | 27 CATS1 Research project work time† | Assignment 3 DUE: <i>Check Brightspace for date</i> |
| Mar | 6 CATS2 Research project work time | Weekly Padlet |
| | 13 CATS3 Research project work time | Weekly Padlet |
| | 20 GIS Certificate ALUMNI Panel (virtual) Research project work time | |
| | 27 Final Presentations | |
| Apr | 3 Final Presentations | |
| Final Exam Period (Apr 10-23) | | FINAL RESEARCH REPORT & STORY MAPS DUE |

† Work time may be in-class, online, or via scheduled one-on-one meetings with Amy/Jen/Jessica

* 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>