



# GIS Research Project

BIOL-ENVS-ERTH-GEOG-SCIE 4850 WINTER 2024

## Department of Earth and Environmental Sciences

WHEN: WED: 11:35AM—2:25PM

WHERE: LSC BIOLOGY/EARTH SCIENCES B2012

*Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledges held by the Mi'kmaq People, and to the wisdom of their Elders past and present. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.*

*Dalhousie University also acknowledges the histories, contributions, and legacies of African Nova Scotians, who have been here for over 400 years.*

### COURSE INSTRUCTOR(S)

Name	Email	Office Hours
Professor: Jennifer M. Grek Martin	jgrekmartin@dal.ca	LSC Room 3079, TBA
TA: Bay Berry	Bay.Berry@dal.ca	
GIS Centre: Jennifer Strang	jennifer.strang@dal.ca	Booked through GIS Centre

### 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/CO-REQUISITES

Pre-req: ENVS/ERTH/GEOG 3500

Co-req: ERTH/GEOG 4250

### COURSE EXCLUSIONS

Restricted to 3rd and 4th year students.

### COURSE DELIVERY

This course is a blend of lecture and hands-on application, therefore in-person attendance is pretty much required.

**Wednesdays, In-person:** Lecture, group work/discussion, practica, and one-on-one meetings in LSC B2012.  
**If you miss a lecture:** Lectures will not be recorded, but lecture slides will be provided via Brightspace.  
**If you miss a practicum:** You can make up the practicum assignment: it will be due the following week!

This class is three hours in length (with a break), but we will use this time in various ways: traditional lectures, working in small groups, or working on a GIS in-class practicum. As we move toward the second half of the term, more time will be spent in one-on-one meetings about your final research project.

**This is your time, so use it wisely! We cannot guarantee a timely response to any questions asked outside of class time.**

*Note: I am committed to teaching—in class, by email, in marking assignments and exams—and you can expect me to be fair and to want you to learn. I encourage questions, discussion, and a safe and inclusive learning environment. If you are having trouble, let me know! For your part, I hope the respect will be mutual and that the next twelve weeks will be an enjoyable learning experience!*

## COURSE MATERIALS

There is no required textbook for this course, though readings may be provided via pdf or link on Brightspace. The course syllabus, updates, announcements, assignments, and other relevant information will be posted to the course Brightspace page.

## ASSESSMENT

Assignment	Date	total%
In-class Practica (5 @ 3% each)	Weeks 01, 03-06	15%
A01: Topic Area and Data Search	24 January	15%
A02: Proposal Presentation and Discussion	14 February	10%
A03: Project Workflow	28 February	10%
Final Project (50%)		
Presentation	27 March/3 April	15%
StoryMap	10 April	10%
Report	10 April	25%

**There is no Final Exam for this course.**

Conversion of numerical grades to final letter grades follows the

### [Dalhousie Grade Scale](#)

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (0-49)
A- (80-84)	B- (70-72)	C- (55-59)	

## LEARNING OBJECTIVES

After successfully completing this course, students will be able to:

- Conduct an independent GIS-focused research project from experimental design and data collection to analysis and interpretation of results,
- Apply critical thinking skills to problems in the spatial domain,
- Gain confidence in developing research questions, writing proposals, finding and using geospatial data, and solving geospatial problems independently,
- Develop skills in disseminating research through web-based GIS platforms.

## COURSE POLICIES ON MISSED OR LATE ACADEMIC REQUIREMENTS

**LATE ASSIGNMENTS:** Late assignments (including practica and Final Project) will incur a mark deduction penalty of 10% per day. **All assignments, including the final project, will not be accepted later than three days after the initial deadline**, unless I have approved an alternate deadline.

**MISSED CLASS:** If you know you will miss a class, or have missed a class, email me as soon as possible and outline the reason(s) why you will not be attending or did not attend. If the reason is illness or a family emergency, I will allow an extension of any assignments due on that day; any other reason is subject to my discretion. Missed practica can be submitted via Brightspace the following week.

## COURSE POLICIES RELATED TO ACADEMIC INTEGRITY

**Practica:** collaboration during practica is encouraged but each submits their own work for assessment.

**Final Project, Presentation, and Quizzes:** Individual work only.

Plagiarism 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](https://www.dal.ca/dept/university_secretariat/academic-integrity/plagiarism-cheating.html) for more information.

*Note: Generative AI (i.e., ChatGPT) may be very useful as a study tool! However, work turned in for assessment should not use generative AI for content as we are assessing your skills as a budding researcher.*

## COURSE CONTENT/OUTLINE

*Course topics subject to minor changes: check Brightspace early and often!*

10 Jan Introduction to the Course; Brainstorming Research Ideas  
WEEK 01 *Practicum01: Measuring Habitat Fragmentation*

17 Jan Research Development and Data  
WEEK 02 *Guest Session on Searching for Geospatial Data with Julie Marcoux*

24 Jan            Research Workflows  
WEEK 03        *Practicum02: Using Python to build workflows with Jennifer Strang*  
**A01 Due: Topic Area and Data Search**

31 Jan            Guest presentation with NPRI's Tristan Lecompte  
WEEK 04        *Practicum03: TBA (CATS01 or Feature extraction from Raster Data)*

7 Feb             Presenting and Communicating Geospatial Research  
WEEK 05        *Practicum04: Creating a Brochure/Infographic*

14 Feb            **A02 Due: Proposal Presentations and Discussion**  
WEEK 06        *Practicum05: CATS01 or CATS02*

19-23 Feb        *Winter Reading Week!*

28 Feb            Course Update; Final Project Open Work and/or Meetings  
WEEK 07        **A03 Due: Project Plan/Workflow**

6 Mar             Course Update and topic TBA  
WEEK 08        Final Project Open Work and/or Meetings

13 Mar            Course Update and topic TBA  
WEEK 09        Final Project Open Work and/or Meetings

20 Mar            Course Update and topic TBA  
WEEK 10        Final Project Open Work and/or Meetings

27 Mar            **Final Presentations, Room TBA**  
WEEK 11

3 April            **Final Presentations, Room TBA**  
WEEK 12        Course Wrap-up

## University Policies and Statements

### **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 at 1321 Edward St or [elders@dal.ca](mailto:elders@dal.ca). Additional information regarding the Indigenous Student Centre can be found at: [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

### **Internationalization**

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." Additional internationalization information can be found at: <https://www.dal.ca/about-dal/internationalization.html>

### **Academic Integrity**

At Dalhousie University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all 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. Additional academic integrity information can be found at: [https://www.dal.ca/dept/university\\_secretariat/academic-integrity.html](https://www.dal.ca/dept/university_secretariat/academic-integrity.html)

### **Accessibility**

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre ([https://www.dal.ca/campus\\_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.html)) for all courses offered by Dalhousie with the exception of Truro. For courses offered by the Faculty of Agriculture, please contact the Student Success Centre in Truro (<https://www.dal.ca/about-dal/agricultural-campus/student-success-centre.html>)

### **Conduct in the Classroom – Culture of Respect**

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

## **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 (Strategic Priority 5.2). Additional diversity and inclusion information can be found at: <http://www.dal.ca/cultureofrespect.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. The full Code of Student Conduct can be found at: [https://www.dal.ca/dept/university\\_secretariat/policies/student-life/code-of-student-conduct.html](https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html)

## **Fair Dealing Policy**

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. Additional information regarding the Fair Dealing Policy can be found at: [https://www.dal.ca/dept/university\\_secretariat/policies/academic/fair-dealing-policy-.html](https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy-.html)

## **Originality Checking Software**

The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method. Additional information regarding Originality Checking Software can be found at: [https://www.dal.ca/dept/university\\_secretariat/policies/academic/student-submission-of-assignments-and-use-of-originality-checking-software-policy-.html](https://www.dal.ca/dept/university_secretariat/policies/academic/student-submission-of-assignments-and-use-of-originality-checking-software-policy-.html)

## **Student Use of Course Materials**

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books,

journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.

## Student Resources and Support

### University Policies and Programs

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

[http://www.dal.ca/academics/important\\_dates.html](http://www.dal.ca/academics/important_dates.html)

Classroom Recording Protocol: [https://www.dal.ca/dept/university\\_secretariat/policies/academic/classroom-recording-protocol.html](https://www.dal.ca/dept/university_secretariat/policies/academic/classroom-recording-protocol.html)

Dalhousie Grading Practices Policies: [https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html)

Grade Appeal Process: [https://www.dal.ca/campus\\_life/academic-support/grades-and-student-records/appealing-a-grade.html](https://www.dal.ca/campus_life/academic-support/grades-and-student-records/appealing-a-grade.html)

Sexualized Violence Policy: [https://www.dal.ca/dept/university\\_secretariat/policies/health-and-safety/sexualized-violence-policy.html](https://www.dal.ca/dept/university_secretariat/policies/health-and-safety/sexualized-violence-policy.html)

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

### Learning and Support Resources

General Academic Support – Advising (Halifax): [https://www.dal.ca/campus\\_life/academic-support/advising.html](https://www.dal.ca/campus_life/academic-support/advising.html)

General Academic Support – Advising (Truro): <https://www.dal.ca/about-dal/agricultural-campus/ssc/academic-support/advising.html>

Student Health & Wellness Centre: [https://www.dal.ca/campus\\_life/health-and-wellness.html](https://www.dal.ca/campus_life/health-and-wellness.html)

On Track (helps you transition into university, and supports you through your first year at Dalhousie and beyond): [https://www.dal.ca/campus\\_life/academic-support/On-track.html](https://www.dal.ca/campus_life/academic-support/On-track.html)

Indigenous Student Centre: [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

Indigenous Connection: <https://www.dal.ca/about-dal/indigenous-connection.html>

Elders-in-Residence (The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit the office in the Indigenous Student Centre or contact the program at [elders@dal.ca](mailto:elders@dal.ca) or 902-494-6803: <https://cdn.dal.ca/content/dam/dalhousie/pdf/academics/UG/indigenous-studies/Elder-Protocol-July2018.pdf>

Black Student Advising Centre: [https://www.dal.ca/campus\\_life/communities/black-student-advising.html](https://www.dal.ca/campus_life/communities/black-student-advising.html)

International Centre: [https://www.dal.ca/campus\\_life/international-centre.html](https://www.dal.ca/campus_life/international-centre.html)

South House Sexual and Gender Resource Centre: <https://southhousehalifax.ca/about/>

LGBTQ2SIA+ Collaborative: <https://www.dal.ca/dept/vpei/edia/education/community-specific-spaces/LGBTQ2SIA-collaborative.html>

Dalhousie Libraries: <http://libraries.dal.ca/>

Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>

Dalhousie Student Advocacy Services: <https://www.dsu.ca/dsas?rq=student%20advocacy>

Dalhousie Ombudsperson: [https://www.dal.ca/campus\\_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html](https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html)

Human Rights and Equity Services: <https://www.dal.ca/dept/hres.html>

Writing Centre: [https://www.dal.ca/campus\\_life/academic-support/writing-and-study-skills.html](https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html)

Study Skills/Tutoring: [http://www.dal.ca/campus\\_life/academic-support/study-skills-and-tutoring.html](http://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html)

Faculty of Science Advising Support: <https://www.dal.ca/faculty/science/current-students/undergrad-students/degree-planning.html>

## **Safety**

Biosafety: <http://www.dal.ca/dept/safety/programs-services/biosafety.html>

Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

Radiation Safety: <http://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

Laser Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety/laser-safety.html>