



**DALHOUSIE
UNIVERSITY**

Faculty of Science Course Syllabus – Draft January 2021

**Department of Biology
BIOL/MARI/ENVS 3623.03**

***Coastal Ecology*
July 5 – 22, 2021**

Our ability to offer this course in-person for Summer 2021 will depend on the health and safety regulations in place at the time. If in-person field courses are not permitted, an online version of this course will be offered.

Instructor(s): Dr. Jen Frail-Gauthier (she/her) jfrail@dal.ca 902-497-6372

Lectures: 9:05 AM TBA (full details in schedule and will be given on first day) (due to potential COVID restrictions, “lectures” may be delivered online)

Laboratories: LSC 2102 (full details in schedule and will be given out on first day) (due to potential COVID restrictions, we may use multiple lab rooms, or have “shifts”)

Field trips: July 7, 9, 12 (half day), 14, 15, and 20 (full details in schedule and will be given out on the first day)

Demonstrators: TBA

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.

Coastal Ecology supports an open, respectful, and safe learning environment, for all students. As part of the Dalhousie Strategic Direction, we support diversity, equality, and inclusion.

Course Description

(from Dalhousie Calendar)

Hands-on study of the anthropogenic impacts on the structure and function of coastal ecosystems. Through field trips, laboratories and guest demonstrations, students examine ecosystem health, e.g. communities on rocky shores, salt marshes and sandy shores and learn basic experimental design, principles of environmental assessment and monitoring, and coastal habitat remediation.

Course Prerequisites

BIOL 2003.03 (Diversity of Life 1); BIOL 2060.03 (Ecology) or BIOA 3001.03

Overview

Applied Coastal Ecology aims to provide students with field and laboratory experiences, including the geology, biology, ecology and conservation, of the sensitive coastal ecosystems in Nova Scotia. Nova Scotia is surrounded by the ocean (over 7 500 km of coastline!), and we will get to experience various coastal zones along the Atlantic Coast and the Bay of Fundy during this three-week course. Students will learn about the geological dynamics, ecology and biological

interactions of the main coastal zones seen in Nova Scotia (rocky shores, sandy beaches, sand dunes, mudflats and salt marshes) through lectures and accompanying field trips. Physical and biotic factors will be examined and compared across various coastal zones, including the intertidal zonation, physical parameters, and biological interactions. Specifically, comparisons of pristine and impacted coastal areas will be done to examine the human impacts along our coasts. Day-long field trips will explore each of the main coastal zones, and short experiments and collections will be done in the field and during lab times. Additionally, through guest lectures and student-led seminars, students will explore the sensitivity of these coastal ecosystems and examine various human impacts on coastal zones in Nova Scotia and all over the world. We will also recognize, understand, and respect indigenous knowledge and traditional land-use issues in Nova Scotia, specific to coastal zones. Canada's Ocean Playground, here we come!

Course Objectives/Learning Outcomes

As described above, by the end of this course, students...

- ✓ ... will understand the biology, ecology and geology of sandy shores, rocky shores, salt marshes and mudflats.
- ✓ ... will be able to identify key flora and fauna of these ecosystems, and know which are indicative of pristine versus impacted coastal areas.
- ✓ ... will be able to effectively and efficiently work in the field (collecting samples, writing thorough field notes, following instructions and using scientific curiosity to explore key questions).
- ✓ ... will be able to use scientific equipment in the lab and field and be able to effectively process samples in the lab and quantify animals and plants to explore key questions.
- ✓ ... will be able to manage group work and work effectively with peers.
- ✓ ... will be able to critical analyze and synthesize information in independent term projects on human impacts in the coastal zone (written paper and oral presentation).
- ✓ ... will gain extensive information and external knowledge from a variety of invited guests from industry, government and research.
- ✓ ... will recognize, understand, and respect indigenous and traditional knowledge and land-use issues in Nova Scotia.
- ✓ ... will develop new time management tools to manage a variety of work tasks in a short period of time.
- ✓ ... will have greatly enhanced their undergraduate learning experience through the SEASIDE program!

Course Materials

No extra course material needs to be purchased for this class. Field books will be provided. Course information will be available on the new BrightSpace online learning classroom.

Course Assessment

Evaluation subject to change if COVID restrictions keep some, or all, of this course online

Participation: 10%

- Includes attendance, participation on field trips and during class discussions (especially during student seminars).

Quizzes and in-class active learning: 5%

- Based on lecture material; usually given same day (“pop quizzes”) or beginning of following lecture. To minimize passive lecturing, you will do various in-class activities to be handed in as well.

Field Book: 15%

- A good scientist needs good notes (thorough AND neat!). The field book is like your “lab book”. Record ALL observations from the field, notes, and activities. We will go over a good “field book” during the first class. Drawings included! Every student must hand in their own field book. The field notebooks will be provided for you- they are made of “rain-writeable” paper, so they can still be used if they get damp and wet! Field books must be initialed by myself or one of the Demonstrators at the end of the field day.

Reflections and Journaling: 5%

- To get the most of your learning experience in the short timeframe of coastal ecology, you will do an end-of-day reflection on your experiences and things you learned throughout Coastal. Due at the end of class, but random checks will assure that you are actually DOING these on a daily basis (as that is the point!). Indigenous/traditional knowledge should be incorporated.

Laboratory/Field Exercises and Mini-Reports: 30%

- Depending on the field trip, there will be short exercises to do in the field, and again once you are back in the lab. Some field trips may require data analysis and mini-field trip/lab reports will be written. The three lab assignments are **group assignments**. You will work in the lab with your field trip group (~4 students depending on class size) and work on questions and data analyses together.
- Includes 5% (individual) for review of Coastal Reports from Ecology Action Centre/Fundy FORCE tidal turbines or other Nova Scotia Coastal hot topics (will be assigned as needed).

Seminar Presentation: 10%

- (Individual assignment) Over 1/3 of your grade comes from this, so most of your out-of-class energy will be focused on creating your own “lecture”, and subsequent paper, on a topic of impacts in the coastal zone (list will be given out during the first class and you should choose your topic by the end of the first class- no duplicates!) The presentation should be lecture-style, as you will be teaching the class about your topic. Presentations are to be approximately 10-12 minutes long, with questions from the class at the end.

Seminar Paper: 25%

- (Individual Assignment) Includes 20% for the paper and 5% for the seminar outline and annotated bibliography due at mid-week 1. The papers should be in the format of a review paper; with appropriate, peer-reviewed references (a paper written from Wikipedia is not acceptable!) Full details in a separate document.

Remember, we aim to have a lot of fun in this class, with an outgoing, relaxed atmosphere, but this is a third year Biology class, and you are expected to perform as you would in any upper level class! I (and past students) HIGHLY recommend doing work early (seminar paper) to avoid last minute rush and stress (just LOOK at the last week!!) Take advantage of any early days and the first week!!

| Component | Weight (% of final grade) | Date |
|---|---------------------------|--------------------|
| <i>Tests No formal exams in BIOL 3623</i> | | |
| Assignments | | |
| Field Book (Individual) | 15% | Last Day – July 22 |
| Reflections and Journaling | 5% | All Course |
| Lab Assignments (3; Group) | 25% | TBA |
| Ecology Action Centre (Individual) | 2.5% | TBA |
| Fundy FORCE tidal turbine review | 2.5% | TBA |
| Annotated Bibliography (Individual) | 5% | Wed July 7 |
| Term Paper (Individual) | 20% | Last Day – July 22 |
| Oral Presentation (Individual) | 10% | July 21 and 22 |
| Participation | 10% | All Course |
| Quizzes | 5% | All Course |

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

Attendance is mandatory unless a VALID REASON is given. Attendance will be taken every day, and is part of the Participation grade.

What to Expect (and what is expected of YOU) on Field Trips and during Labs:

1. You are expected to attend all field trips and participate! It is not fair for 5 students to do all the work in the field and lab, and everyone else reap the benefits. Even though you will be working in groups, you are expected to participate fully. You will never be expected to do anything you are not comfortable with, nor if you think situations are too dangerous- there are lots of students for delegation.
2. Expect to get wet and muddy! We will be going on field trips to the coastal zones- this means close to the ocean, this means lots of water... and because you will be doing lots of examinations in the field, lots of dirt (mud, salt water, sand, grass) to sit/kneel on. Don't wear your nicest clothes!
3. Be academically prepared for the field trips. We will go over each field trip in class, but make sure you read your field exercises ahead of time, so you know what you should be doing at what to expect. We will prepare all field guides and equipment the day before the trip. It is your responsibility to bring writing equipment and your field exercises/books!

4. Bathrooms? Not all field trip locations will have them. DON'T avoid drinking so you won't have to go pee. It's very important to stay hydrated!

5. Be respectful and mature on field trips. Yes, it's important to have fun, but complete silliness will not be tolerated- you have work to do in the field! This goes for texting and cell phone use.

What to Bring:

Pay attention to the forecasted weather (of the place we are going!) and remember, we will be at the coast (they don't lie when they say "high of 25, except 14 along the coast" during weather forecasts). Field trips are rain or shine! Extra items may be emphasized before the field trip, and the list will change based on location. Use common sense! Below is a list that may help you:

- appropriate footwear for walking and getting wet... -rubber boots... -rain pants or hip waders if you have them (we can supply some)
- jacket, layers of clothes, in case it starts off cool and gets really warm (and vice versa!)
- HAT!... -extra pair of socks, if you are wearing them
- sunscreen, bug spray, if desired
- energy-rich food, snacks and LOTS of water! (you will get hungrier than you think!)
- plastic bag for garbage and wet clothes... kleenex or baby wipes
- recommended: soapy facecloth in a Ziploc bag to wash your hands
- digital camera, cell phone... -pen, pencils, field book and field exercises, clipboard
- cash for pit-stops

And an ergonomic back pack to carry it in! We can drop our stuff when we work, but sometimes we will have a lot of hiking to get to where we need to go! (i.e. Blue Beach, Kingsburg Beach). The bus also stays with us, so we can leave items on the bus.

Course Schedule

Schedule and field trip details subject to change based on COVID-19 health and safety recommendations in place at the time.

| Date | Activity | Extra Information |
|----------------|--|--|
| Mon. July 5 | <u>Lectures</u> : Introduction to the class, logistics, evaluations, field trips, etc. <u>Introduction to Coastal Ecology</u> - Setting the Scene | Sign up for Seminar topic! Read: Ecology Action Centre readings GUEST TBA |
| Tues. July 6 | <u>Lectures AM</u> : The Coastal Zones (ecology, biology, processes, etc). Lectures PM: Continued, Human Impacts in the Coastal Zone | GUEST TBA |
| Wed. July 7 | <u>FIELD TRIP 1!</u> Conrad's Beach and Rainbow Haven (Atlantic Shore sandy beaches and dunes) | Bus leaves at 9 AM Annotated Bibliography/Paper outline due by 11:59 PM |
| Thurs. July 8 | AM: Guests? PM: Sandy shore lab work | GUEST: TBA Sandy Shore lab questions due July 8th 11:59 PM |
| Fri. July 9 | <u>FIELD TRIP 2!</u> Cranberry Cove/Peggy's Cove ("pristine" rocky shore) | Bus leaves at 10 AM |
| Mon. July 12 | <u>Guest Lectures AM</u> Lecture: Geology of Nova Scotia PM: <u>FIELD TRIP 3 (part day)!</u> Halifax Harbour (impacted rocky shore) | PM Walking Trip: Meet at Halifax Waterfront at 3:30 PM (low tide at 5 PM) |
| Tues. July 13 | Lab work for Rocky Shore | Guest TBA |
| Wed. July 14 | <u>FIELD TRIP 4!</u> Windsor Causeway (macrotidal, new salt marsh) and Blue Beach Fossils | Bus leaves at 7:30 AM |
| Thurs. July 15 | <u>FIELD TRIP 5!</u> Chezzetcook Inlet, Eastern Shore (old Atlantic salt marsh, tidal inlets, mudflats) | Bus leaves at 7:30 AM (tides!) |
| Fri. July 16 | Lab Day – Salt marshes Guest lecture TBA | Rocky Shores assignment due 11:59 PM |
| Mon. July 19 | Remaining lab and "free work" day | Salt marshes Assignment due any time before Friday July 23rd 11:59 PM |
| Tues. July 20 | <u>FIELD TRIP 6!</u> Sand Dollar Beach, Hirtle's Beach and Lunenburg (various coastal systems with visible coastal threats and impacts) | Bus leaves at 830 AM SHARP |
| Wed. July 21 | Student Seminars (speaker order random) | Bring treats to class! |
| Thurs. July 22 | Student Seminars (speaker order random) | Potluck lunch --- COVID-depending Seminar papers due Field Books due |

University Policies and Statements

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

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

Missed or Late Academic Requirements due to Student Absence (policy)

https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.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>