

Faculty of Science Course Syllabus
Department of Biology
MARI 4350.03 / MARI 5350.03
Cutting Edge in Marine Sciences
Winter 2021-2022

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

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Teaching assistant (TA): Kristen Cyr (kr236174@dal.ca)

Lectures & Tutorials: Two 1.5 hours per week: Mon & Wed 11:35-12:55 (Online Synchronous, switching to in-person when restrictions allow)

Course Description

This course focuses on current, often hotly debated topics in marine science. The goal is to explore what specific topics are dominating the field of marine science now and where they will be heading in the near future. We intend for students to become comfortable in exploring research areas that are so novel that little is known and much of what we think we know is hypothetical. We explore these rapidly growing research areas by discussing recently published papers and current research initiatives on urgent issues, including biodiversity, oceanography, conservation, management, climate change, ocean education, and human-ocean interactions. Class format includes lectures, case-studies, as well as active discussion, debates, group work and hands-on assignments.

Course Prerequisites for undergraduate students

BIOL 2060.03 and OCEA 2000X/Y.06 (or OCEA 2001.03 and OCEA 2002.03) and one of the following: BIOL 3065.03 or MARI 3063.03 or MARI 3080.03 or MARI 3602.03 or MARI 3761.03

Course Prerequisites for graduate students

none

Course Exclusion

none

Learning Objectives

Students will learn about and discuss current topics in marine sciences that are at the forefront of fundamental and applied research.

Students will critically evaluate recent, high-profile publications and identify their importance, strengths, and weaknesses.

Students will think about and explore possible next steps for current research topics and initiatives. Students will assess the importance of those topics to society and how to best communicate these to non-specialist audiences.

Students will debate the relevance and importance of newly gained knowledge for management, conservation, education, and policy development.

Undergraduate students will prepare a 1-page scientific briefing on how to advance a selected topic, how this benefits society, and how to communicate this through visual means, and give a short oral summary.

Graduate students will prepare a lecture-style presentation and class activity on a selected topic.

Course Materials

All materials will be accessed via Brightspace website <https://dal.brightspace.com/d2l/home/203673>

There is no textbook.

Literature reading assignments will be given at the first class in the term.

Course Delivery (online synchronous or in-person when possible)

- Course Brightspace page <https://dal.brightspace.com/d2l/home/203673>
- Lectures & Tutorials will be online synchronous (or in-person when possible) and often interactive and interspersed, so online (or in-class) attendance is required for the entire 1.5 hour sessions
 - o Mondays and Wednesdays: 11:35-12:55
 - o Course delivery will happen through collaborate sessions via Brightspace <https://ca.bbcollab.com/guest/d0ca2e5b55044fd9b446dec37b529569>
 - o Delivery will switch to in-person when restrictions allow
 - o You will require a laptop with camera and microphone for all classes
 - o Attendance is required, sessions will not be recorded. If you are connecting from a different time zone and this poses challenges, please contact instructors asap to discuss solutions.
 - o Lecture slides will be posted as pdfs on Brightspace after each session
 - o For some Tutorials, students will need to prepare activities beforehand, which will be announced and posted ahead of time
 - o Assignments and their instructions will be introduced in class and posted on Brightspace
- Contact with instructors and TA:
 - o There is time after each session to ask questions in person
 - o There is the discussion board on Brightspace to ask questions
 - o Email us with any other questions or concerns, we can schedule individual video calls if needed

Course Assessment Explanation

To account for different knowledge levels of undergraduate and graduate students but have all contribute similarly to the various lecture and tutorial components, we will have different major assignments for each group (short written and oral briefings vs 30-minute lecture), yet similar contributions to common components (literature review, paper presentation, exam).

MAJOR COURSE ASSIGNMENT for Undergraduate Class:

Undergraduate students will engage in a whole-term project on researching a cutting-edge topic that is of interest to them and developing a **2-part written assignment due on 10 April** that contains

1. A new research project idea that clearly advances our understanding of a cutting-edge topic. This research idea should be presented with (i) some introductory background that identified its importance and where the science gaps are, (ii) a clearly defined research question and hypothesis, (iii) some details on the method that is proposed to collect the data and answer the research question, (iv) a description of anticipated outcomes, and (v) a justification of how this project would benefit the scientific enterprise and/or society at large. This part of the assignment is aimed at a scientific audience.
2. A visual summary (e.g. an infographic, video or drawing) that communicates the importance of this topic to a non-specialist audience. This part of the assignment is aimed at conveying the research project and its importance to the general public.

At the end of term (**March 28 & 30**) students will present their research idea also in a **3-5 minute oral presentation** that is discussed and critiqued by the class.

The major course assignment **can be completed individually or in a group of no more than 3 students**. If students choose a group assignment, they need to inform course instructors before March 14. The same grade will be given to all students in that group. More time (up to 5 minutes) can be allotted for group presentations.

MAJOR COURSE ASSIGNMENT for Graduate Class:

Graduate students will review the current scientific literature and **prepare a 30-40 minute lecture** on a current cutting-edge topic of their interest and prepare an **associated 20-30 min synchronous in-class activity** to engage students in the presented topic and critically discuss its importance for science and society, existing gaps, and next steps in this line of research.

The lecture should introduce the topic and its importance, review the state of the science in the chosen field, and highlight/present a few recent research papers that illustrate where the cutting edge of research is now, including open questions that will need to be answered next.

The associated activity should engage students in a hands-on way with the chosen topic and could include some form of quiz, data analysis, discussion, or a combination thereof.

Please discuss your ideas about topics and activities with the instructors well before the lecture is due.

Rubrics for grading oral presentations and written assignments:

- Style [15%] (Clarity of speaking/writing)
- Format [15%] (Organization/length of presentation/briefing)
- Content [60%] (Depth of research; Detail of background information; Critical evaluation of recent facts and results; Proposed gaps and next steps; Understanding of methods and approach; Significance to science and society)
- Referencing [10%] (correct citations in presentation/proposal and reference list)

Graduate students need to achieve a B- to pass the course (anything below B- is an F).

MINOR COURSE ASSIGNMENTS:

One minor graded assignment will be completed by each student (graduate and undergraduate alike):

- Cutting edge journal review: Each individual student will research a pre-assigned month of issues of the journals *Science*, *Nature* or *PNAS* for current marine topics and present a selected topic in a

short (3-5 minute) oral presentation on Jan 17, 19 or 24. The student will also fill out an online Google Doc with a summary of this and other prominent marine research topics in that respective journal issues.

CONTRIBUTION TO DISCUSSION AND ACTIVITIES

A participation grade will be given that reflects both regular attendance in classes and regular contributions to class discussion and activities. This is a very interactive class and students are expected to actively participate in the tutorial section of the class.

EXAM:

There will be a **cumulative Final Exam** written on the collective material from all lectures given during the term. The exam will be scheduled during the April Exam Period and contain both multiple choice and short answer questions.

Course Assessment for undergraduate students

Component	Weight (% of final grade)	Due date
<i>Final exam</i>	35	<i>April (Exam period)</i>
<i>Contribution to discussion & activities</i>	10	<i>Throughout term</i>
<i>Assignment: Cutting edge journal review</i>	15	<i>Jan 17, 19, 24</i>
<i>Major assignment (research idea): Oral presentation</i>	15	<i>March 28 & 30</i>
<i>Major assignment (research idea): Written summary</i>	25	<i>April 10</i>

Course Assessment for graduate students

Component	Weight (% of final grade)	
<i>Final exam</i>	35	<i>April (Exam period)</i>
<i>Contribution to discussion & activities</i>	10	<i>Throughout term</i>
<i>Assignment: Cutting edge journal review</i>	15	<i>Jan 17, 19, 24</i>
<i>Major assignment (Lecture): Oral presentation</i>	25	<i>Assigned individually</i>
<i>Major assignment (Class Activity)</i>	15	<i>Assigned individually</i>

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

- This is a highly interactive class and students need to attend synchronous (or in-person) sessions at all times and contribute to class discussions, hands-on activities, and presentation feedback. Missing more than 2 classes without a Student Declaration of Absence (SDA) form will lower the grade on in-class activities.
- All assignments have a strict deadline; late assignments will be docked 10% per day late; missed assignments and exams will count 0%; with the following exceptions:

- In case of illness, please use the Student Declaration of Absence (SDA) form for late or missed academic requirements. Late penalties will not apply if SDA is submitted prior to the due date. Maximum 2 uses of the SDA per term. Students who are ill for an extended period and thus miss multiple requirements should be referred to Patricia Laws, Assistant Dean (Student Affairs).
- In case of technological malfunction (internet failure, power outage), please notify the instructor via email as soon as possible and provide a written explanation.
- If excused, we will provide the following alternative arrangements:
 - missed assignments: an extended deadline will be offered.
 - missed final exam: a make-up exam will be offered on another date.
- The content of cancelled lectures or tutorials due to technological malfunction (internet failure, power outage) or other unforeseen circumstances will either be shifted to a later date or dropped from the course. Only topics presented and discussed in lectures and tutorials will be tested in the exam.
- In case of group projects, each student is required to contribute to the group's work, and the group will be assigned one grade.
- Plagiarism software will be used to check for the originality of each student's written assignments.

Course Content

Week	Day	Lecture & Tutorial Topics
1	W - 5 JAN	1 – Introduction (BW)
2	M - 10 JAN	2 – Humanity and the ocean (HL)
	W - 12 JAN	3 – Discovering the unknown: marine biodiversity (BW)
3	M - 17 JAN	4 – Cutting Edge Literature review (HL)
	W - 19 JAN	5 – Cutting Edge Literature review (HL)
4	M - 24 JAN	6 – Cutting Edge Literature review (HL)
	W - 26 JAN	7 – Ocean literacy & ocean education (BW)
5	M - 31 JAN	8 – Industrial development of the oceans (HL)
	W - 2 FEB	9 – Fishing and Fisheries Management (BW)
6	M - 7 FEB	10 – Marine plants and their use (HL)
	W - 9 FEB	11 – Marine protected areas (BW)
7	M - 14 FEB	12 – Climate change projections in the ocean (HL)
	W - 16 FEB	13 – The melting cryosphere (BW)
8	--- STUDY BREAK ---	
9	M - 28 FEB	14 – Plastic pollution (HL)
	W - 2 MAR	15 – The microbial ocean (BW)
10	M - 7 MAR	16 – Coral reefs (GUEST LECTURE)

	W- 9 MAR	17 – Remote sensing tools in marine science and conservation (BW)
11	M - 14 MAR	18 – Graduate student lecture (HL)
	W - 16 MAR	19 – Ocean sound & noise (BW)
12	M - 21 MAR	20 – Marine disease (HL)
	W - 23 MAR	21 – Indigenous perspectives and approaches (BW)
12	M - 28 MAR	22 – Major Assignments: Presentations (BW)
	W - 30 MAR	23 – Major Assignments: Presentations (BW)
13	M - 4 APR	24 – Major Assignments: Presentations - Extra time if needed (BW)
		Q & A for Final Exam (HL)

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 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>



Dalhousie COVID-19 information and updates: <https://www.dal.ca/covid-19-information-and-updates.html>