

Faculty of Science and Faculty of Graduate Studies Course Syllabus
Department of Biology

MARI 3761.03 — BIOL 3761.03

Marine Ecology

Fall 2021

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

Instructor: Dr. Diego Ibarra | email: Diego.Ibarra@dal.ca | Office: LSC-3625 (Oceanography)
Questions **MUST be posted in Brightspace's Discussion boards** (see guidelines below). Only use email for private/personal matters.

Lectures: Mon, Wed 1:05 - 2:25 pm | *Location:* Studley LSC-COMMON AREA C240

Course delivery: In-person. However, due to the covid19 pandemic, we can switch to online teaching if needed.

TA: Hannah Kosichek | email: hn652899@dal.ca

Time zone: All times (syllabus, Brightspace, calendar, etc.) are in **Halifax Time (ADT/UTC-3 or AST/UTC-4)**

Course Description

Building upon an understanding of basic ecological and evolutionary principles, and a familiarity with the major marine invertebrate and algal taxa, this course examines patterns and processes at the organismal, population and community levels that determine the diversity and distribution of life in the sea.

Course format

The course is intended to be delivered in-person. However, due to the covid19 pandemic, we can switch to online delivery if cases of covid19 in Halifax and/or Dalhousie increase to unsafe levels. If this is the case, a Brightspace announcement will be used to do the switch from in-person to online (or vice versa).

In-person

Lectures are Mondays and Wednesdays from 1:05 - 2:25 pm in LSC-COMMON AREA C240.

Please wear a MASK while in the classroom and hallways.

Midterms will take place in the classroom during lecture time. The final exam's place and location will be determined later by the registrar's office.

Quizzes and online discussion will be the same as in the online format (see below).

Online

If covid19 prevents us from doing in-person learning, we can switch to the following online format. The online version of this course is delivered mainly using Brightspace and zoom. You will need a laptop with a webcam and microphone (or equivalent hardware), and you will need to install (free) zoom software.

- **Synchronous Zoom lectures (required).** These will take place at the same time as the in-person lectures (Mon, Wed 1:05 - 2:25 pm - ADT). Lectures will be delivered via zoom (link in Brightspace). This is also a time to ask questions, spark discussion and interact with each other. **These synchronous events will NOT be recorded.** During these video-calls, please follow the etiquette below:
 - You are expected to have your **CAMERA ALWAYS ON** when in the zoom room, therefore:
 - Be mindful of your clothing and appearance
 - Be mindful of your background (virtual backgrounds are ok)
 - Silence your cellphone and other electronic devices
 - Advise your roommates about your video-call so they are also mindful too
 - Keep you **MICROPHONE ALWAYS MUTED**, unless you need to speak
- **Asynchronous quizzes (required)** are delivered online (via Brightspace) under an asynchronous format. Quizzes are released weekly (on Thursdays) but are only available for a 24-hour period. **Please read carefully the “Weekly quizzes” section below.**
- **Synchronous midterms and final exams (required).** There are three required exams that must be done at specific date/times (see schedule for details).

Course Prerequisites, Cross-listings and Restrictions

- **Prerequisites:** BIOL 2060.03 (or BIOA 3001.03), BIOL 2003.03 (or BIOL 2004.03) and OCEA 2000X/Y.06 (or OCEA 2001.03 and OCEA 2002.03)
- **Cross-listings:** BIOL 3761.03
- **Restrictions:** This course is restricted to 3rd and 4th year students

Course Objectives/Learning Outcomes

- Contrast the physical and chemical environment in the ocean with that on land, and explain how the ocean milieu has shaped the evolution of life and the structure and functioning of marine ecosystems
- Explain the interplay of biological interactions and physical factors in determining patterns of intertidal zonation on rocky shores
- Contrast developmental strategies of marine invertebrates with larval forms, in terms of evolutionary trade-offs and biogeographic patterns
- Account for variation in patterns of larval dispersal, settlement and recruitment among benthic invertebrates, in terms of oceanographic features and biological factors
- Explain processes that determine patterns of distribution, abundance and productivity of kelp beds/forests along temperate coasts
- Explain the roles of disturbance and biological interactions (competition, grazing, predation and disease) in shaping community organization in kelp beds/forests worldwide, and the impact of invasive species on the kelp-bed ecosystem of the Northwest Atlantic
- Describe the distribution, environmental features, and trophic structure of tropical coral reefs
- Account for the high productivity and diversity of coral reefs, and their vulnerability to environmental stressors and human impacts
- Describe the physical, chemical and biological environment of the deep-sea, and explain how this accounts for patterns of species abundance and diversity
- Account for the high productivity and biomass, but low species diversity, at hydrothermal vents

- Evaluate the effects of humans, past and present, on marine species, populations and ecosystems worldwide

Course Materials

Textbook (optional):

- Nybakken JW and Bertness MD (2004) *Marine Biology: An Ecological Approach*. 6th Edition. Benjamin Cummings, San Francisco

Class notes: Class .PDF notes are posted on Brightspace. Quizzes, midterms and final are based on these notes.

Panopto Videos: Most lectures have an accompanying Panopto video that students can watch if they need additional help understanding the material. Students are not required to watch these videos.

Announcements: Electronic announcements and additional material will be posted on Brightspace. Students should check the site frequently.

Course Assessment

Component	Weight (% of final grade)	Date
Weekly Quizzes and hand-written cheat-sheets	50	See schedule below
Midterm exam 1	15	See schedule below
Midterm exam 2	15	See schedule below
Final exam	20	Determined by Registrars Office
Participation in Discussion Boards	2% bonus	Continuously
TOTAL	/100	

Weekly Quizzes

Quizzes are designed to test you on the material from lectures. Quizzes are based on the .PDF lecture-notes uploaded to Brightspace. Quizzes are online (approx. 10 minutes) and are applied via Brightspace with *LockDown Browser* (i.e. prevents other software to run in your laptop during the exam) and *Respondus monitor* (uses your laptop's webcam to record your quiz session and flags any suspicious behavior). Each quiz will be available for 24 hours (see specific due dates in the schedule below). Students can answer the quiz at anytime during those 24 hours; however, there is set amount of time to answer the quiz once it is started, and there is only one attempt. Students are **required** to make and use a **hand-written "cheat-sheet"** for each Quiz. **A photo of the cheat-sheet must be uploaded to its corresponding Brightspace dropbox BEFORE you do the quiz.** Cheat-sheets not meeting specifications (see below) will result in a zero grade on the corresponding quiz.

Cheat-sheet specifications:

- Cheat-sheets are personal. **Copying somebody else's cheat-sheet is a serious plagiarism offence** requiring the Instructor to report all involved parties to the Academic Integrity Office.
- Cheat-sheets **MUST** be hand-written on paper. Digitization, electronic manipulation, photocopying, photographing and/or printing of cheat-sheets is not allowed.
- On your cheat-sheet, write your name, B00 number, date and Quiz number
- Size: each cheat-sheet is limited to one side of a letter-sized sheet of paper.
- Content: Anything you want, but **must** demonstrate an effort to synthesize lecture content.

Missed quizzes. There are no makeup quizzes. However, the quiz with the lowest mark will be automatically dropped so that it does not count towards the final grade. Therefore, students can miss **one** quiz during the course (for any reason) without any penalty. Students that enrol late can get exemptions for the quizzes missed before they enrolled to the class (up to two weeks from the start of class). Students with prolonged illness and other extenuating circumstances can contact the instructor to arrange for further quiz exemptions. Please read the instructions below (Course Policies > Missing course requirements) on how to submit an SDA form and ask for quiz exemptions.

Midterms and Final exam

These exams are online via Brightspace with *LockDown Browser* (i.e. prevents other software to run in your laptop during the exam) and *Respondus monitor* (uses your laptop's webcam to record your quiz session and flags any suspicious behavior). The format is multiple choice and/or short answers. You **are allowed** to use your cheat-sheets during these exams. These exams will be synchronous. Date/time of the midterm is shown in the schedule below. For Final exam, date/time will be determined later by the Registrars Office.

The exams will include material from the lectures, quizzes, and discussion boards. Midterm 1 will include content from the beginning of the course and up to the material covered on the week of the Midterm 1 exam. Midterm 2 will include content covered after Midterm 1 and up to the material covered on the week of the Midterm 2 exam. The Final Exam will include all the material included in the course.

Missed exams: In extenuating circumstances, a make up exam may be scheduled for students that cannot take the exam at the normal date/time (note: heavy course load and travel are not normally considered extenuating circumstances). Students are strongly encouraged to notify the instructor of any conflict well in advance of the start of the normal exam. Make up exams are commonly scheduled before the date/time of the regularly scheduled exam. There is usually only one make up exam. For midterm exams, students that cannot attend neither the regularly scheduled exam nor the makeup exam, the weight of the missed midterm will be added to the weight of the final exam. If you have extenuating circumstances, please read the instructions below (Course Policies > Missing course requirements) on how to submit an SDA form and ask for make up exam.

Participation in Discussion Boards

You are expected to contribute to the discussion boards (questions **AND ANSWERS**). Please follow the posting guidelines below:

- Before you post your question, **CHECK** if the question has already been asked/answered
- Post only **ONE** question per post. If you have multiple questions, post them in separate posts
- The post's **TITLE** should be your question
- If you know the answer to a question, please help by answering the post
- Be respectful and polite

Participation grades will be computed at the end of the course. First, *engagement points* (see below) will be tallied for each student. Then, a curve will be calculated (after removing outliers) to compute the participation bonus points for each student.

Item	Score (units: engagement points)
New question	1
Already posted question	0 for the first 3 events, -1 for additional events
Correct answer	1
Partially correct answer	0.5
Incorrect answer	0 for the first 3 events, -1 for additional events
Useful comment or sharing a link to a useful resource	1
Using offensive tone or language	-1

Conversion of numerical grades to Final Letter Grades

Undergraduate students follows the Dalhousie Common Grade Scale. Graduate students follow a stricter scale, where a minimum of 70% (B-) is required to pass.

%	Letter Grade	Grade Point Value	Definition
90 - 100	A+	4.30	Exceptional
85-89	A	4.00	Excellent
80-84	A-	3.70	Very Good
77-79	B+	3.30	Good
73-76	B	3.00	
70-72	B-	2.70	Satisfactory
65-69	C+	2.30	
60-64	C	2.00	
55-59	C-	1.70	Marginal Pass
50-54	D	1.00	
<50	F	0.00	

Course Policies

Questions. All questions MUST be posted in Brightspace's Discussion boards (see posting guidelines above). Only use email for private/personal matters.

Missing or late academic requirements. If you qualify for a quiz exemption or a make up exam (see policies in Course Assessment section above), please:

- Email **both**, the TA and the Instructor, briefly explaining your circumstance and dates.
- Fill in a [Student Declaration of Absence \(SDA\) form](#) and upload it to the Brightspace Dropbox designated for SDAs.
- Students with an Accessibility or Accommodation Plan in place **do not** need to submit SDA form.
- For extenuating circumstances (e.g. prolonged illness, family matters, etc.) contact the instructor.

Brightspace will be used to post lectures, updates and announcements.

Late assignments: A 10% reduction in grade will be applied for every day an assignment is late.

Assignment submission: Assignments should be submitted via Brightspace as .pdf file by 11:30 pm on the due date.

Course Content

Detailed Schedule

All dates and times are in **Halifax Time** (ADT/UTC-3 or AST/UTC-4). Note that quizzes, exams and other due dates are shown in **red**.

Week	Date	Content
Class Introduction		
1	Wed, Sep 8 @ 1 pm	Lecture
Module 1. Life on land and in the sea: Worlds of contrast		
2	Mon, Sep 13 @ 1 pm	Lecture
	Wed, Sep 15 @ 1 pm	Lecture
	Thu, Sep 16 @ 11:30 pm	Quiz: Module 1 (and photo of cheat-sheet)
Module 2. The rocky intertidal zone: A test bed for ecological theory		
3	Mon, Sep 20 @ 1 pm	Lecture
	Wed, Sep 22 @ 1 pm	Lecture
	Thu, Sep 23 @ 11:30 pm	Quiz: Module 2 (and photo of cheat-sheet)
Module 3. Reproduction, larval ecology, & recruitment		
4	Mon, Sep 27 @ 1 pm	Lecture
	Wed, Sep 29 @ 1 pm	Lecture
	Thu, Sep 30 @ 11:30 pm	Quiz: Module 3 (and photo of cheat-sheet)
Module 4. The rocky subtidal zone: A hot bed of biological interactions		
5	Mon, Oct 4 @ 1 pm	Lecture
	Wed, Oct 6 @ 1 pm	Midterm 1: Includes Modules 1, 2, 3, and 4 (and photo of cheat-sheet 4)
Module 5. Tropical coral reefs: Oases in a desert ocean		
6	Mon, Oct 11 @ 1 pm	No class (Thanksgiving)
	Wed, Oct 13 @ 1 pm	Lecture
	Thu, Oct 14 @ 11:30 pm	Quiz: Module 5 (and photo of cheat-sheet)
Module 6. The deep: Mountains, plains & hot springs		
7	Mon, Oct 18 @ 1 pm	Lecture
	Wed, Oct 20 @ 1 pm	Lecture
	Thu, Oct 21 @ 11:30 pm	Quiz: Module 6 (and photo of cheat-sheet)
Module 7. Salt-marshes, mangroves and sea grass meadows		
8	Mon, Oct 25 @ 1 pm	Lecture
	Wed, Oct 27 @ 1 pm	Lecture
	Thu, Oct 28 @ 11:30 pm	Quiz: Module 7 (and photo of cheat-sheet)
Module 8. Continental shelf and Soft sediments		
9	Mon, Nov 1 @ 1 pm	Lecture
	Wed, Nov 3 @ 1 pm	Midterm 2: Includes Modules 5, 6, 7 and 8 (and photo of cheat-sheet 8)
10	Mon, Nov 8...	Reading week
	...Fri, Nov 12	Reading week
Module 9. The edge of the continental shelf and underwater canyons		
11	Mon, Nov 15 @ 1 pm	Lecture
	Wed, Nov 17 @ 1 pm	Lecture
	Thu, Nov 18 @ 11:30 pm	Quiz: Module 9 (and photo of cheat-sheet)

Module 10. The open ocean		
12	Mon, Nov 22 @ 1 pm	Lecture
	Wed, Nov 24 @ 1 pm	Lecture
	Thu, Nov 25 @ 11:30 pm	Quiz: Module 10 (and photo of cheat-sheet)
Module 11. Upwelling regions		
13	Mon, Nov 29 @ 1 pm	Lecture
	Wed, Dec 1 @ 1 pm	Lecture
	Thu, Dec 2 @ 11:30 pm	Quiz: Module 11 (and photo of cheat-sheet)
14	Mon, Dec 6 @ 1 pm	Lecture (Wrap-up)
15	Sometime between Dec 9 and 19 (Scheduled by Registrars Office)	Final exam: Includes all course content

NOTE: Dates and topics may change depending on course pace and weather-related class cancellations.

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

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>