

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

MARI 3761.03 — BIOL 3761.03

Marine Ecology

Fall 2022

***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: Tue, Thur 4:05 - 5:25 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: Natalie Klinard | email: natalie.klinard@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 will take place at the time and place indicated at the top of this syllabus.

Please **wear a MASK** while in the classroom and hallways.

Quizzes and 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.

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 (see top of this syllabus). 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: If we need to switch to online teaching, I will post Panopto videos 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
Marine Species YouTube Video	30 in total	
- Species selection	1	See schedule below
- List of sources and media	2	See schedule below
- Script and ancillary text	5	See schedule below
- Thumbnail	1	See schedule below
- YouTube video (landscape 1920x1080p)	15	See schedule below
- Trailer video (portrait 1080x1920p)	6	See schedule below
Weekly Quizzes and hand-written cheat-sheets	35	See schedule below
Midterm exam 1	10	See schedule below
Midterm exam 2	10	See schedule below
Final exam	15	Determined by Registrars Office
Participation in Discussion Boards	2% bonus	Continuously
TOTAL	/100	

** All components are individual*

Marine Species YouTube Video

Detailed instructions are provided in Brightspace in a separate document: *MAIN Video Instructions (START HERE).docx*. Also in Brightspace are many templates and how-to guides to help you make your YouTube video.

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. We will use Dalhousie's software to prevent other software from running in your laptop during the exam, and to use your laptop's webcam to record your quiz session and flag any suspicious behavior.

- **In person:** If in person teaching, quizzes will be done during lecture time as shown in the schedule.

- **On-line:** If we switch to online format, each quiz will be available for 24 hours, dates are the same as if “in person” (see specific due dates in the schedule below), however the closing time will be different... at 11:30 pm. 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 Dalhousie’s software to prevent other software to run in your laptop during the exam, and to use your laptop’s webcam to record your quiz session and flag 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	
73-76	B	3.00	Good
70-72	B-	2.70	
65-69	C+	2.30	Satisfactory
60-64	C	2.00	
55-59	C-	1.70	
50-54	D	1.00	Marginal Pass
<50	F	0.00	Failure

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	Tue, Sep 6 @ 4 pm	Lecture
	Tue, Sep 6 @ 11:30 pm	Submit "Species selection" see MAIN Video Instruction file for details
	Wed, Sep 7 @ 11:30 pm	Submit "List of sources and media" see MAIN Video Instruction file for details
	Thu, Sep 8 @ 4 pm	Lecture
	Sun, Sep 11 @ 11:30 pm	Submit "Script and ancillary text" see MAIN Video Instruction file for details
Making a marine species documentary		
2	Tue, Sep 13 @ 4 pm	Lecture
	Thu, Sep 15 @ 4 pm	Lecture
	Thu, Sep 15 @ 11:30 pm	Submit "YouTube video" see MAIN Video Instruction file for details
	Thu, Sep 15 @ 11:30 pm	Submit "Thumbnail" see MAIN Video Instruction file for details
	Sun, Sep 18 @ 11:30 pm	Submit "Trailer video" see MAIN Video Instruction file for details
Module 1. Life on land and in the sea: Worlds of contrast		
3	Tue, Sep 20 @ 4 pm	Lecture
	Thu, Sep 22 @ 4 pm	Lecture
	Thu, Sep 22 @ 4 pm	Quiz: Module 1 (and photo of cheat-sheet)
Module 2. The rocky intertidal zone: A test bed for ecological theory		
4	Tue, Sep 27 @ 4 pm	Lecture
	Thu, Sep 29 @ 4 pm	Lecture
	Thu, Sep 29 @ 4 pm	Quiz: Module 2 (and photo of cheat-sheet)
Module 3. Reproduction, larval ecology, & recruitment		
5	Tue, Oct 4 @ 4 pm	Lecture
	Thu, Oct 6 @ 4 pm	Midterm 1: Includes Modules 1, 2, and 3 (and photo of cheat-sheet 3)
Module 4. The rocky subtidal zone: A hot bed of biological interactions		
6	Tue, Oct 11 @ 4 pm	Lecture
	Thu, Oct 13 @ 4 pm	Lecture
	Thu, Oct 13 @ 4 pm	Quiz: Module 4 (and photo of cheat-sheet)

Module 5. Tropical coral reefs: Oases in a desert ocean		
7	Tue, Oct 18 @ 4 pm	Lecture
	Thu, Oct 20 @ 4 pm	Lecture
	Thu, Oct 20 @ 4 pm	Quiz: Module 5 (and photo of cheat-sheet)
Module 6. The deep: Mountains, plains & hot springs		
8	Tue, Oct 25 @ 4 pm	Lecture
	Thu, Oct 27 @ 4 pm	Lecture
	Thu, Oct 27 @ 4 pm	Quiz: Module 6 (and photo of cheat-sheet)
Module 7. Salt-marshes, mangroves and sea grass meadows		
9	Tue, Nov 1 @ 4 pm	Lecture
	Thu, Nov 3 @ 4 pm	Midterm 2: Includes Modules 4, 5, 6 and 7 (and photo of cheat-sheet 7)
10	Mon, Nov 7...	Reading week
	...Fri, Nov 11	Reading week
Module 8. Continental shelf and Soft sediments		
11	Tue, Nov 15 @ 4 pm	Lecture
	Thu, Nov 17 @ 4 pm	Lecture
	Thu, Nov 17 @ 4 pm	Quiz: Module 8 (and photo of cheat-sheet)
Module 9. The edge of the continental shelf and underwater canyons		
12	Tue, Nov 22 @ 4 pm	Lecture
	Thu, Nov 24 @ 4 pm	Lecture
	Thu, Nov 24 @ 4 pm	Quiz: Module 9 (and photo of cheat-sheet)
Module 10. The open ocean and Upwelling regions		
13	Tue, Nov 29 @ 4 pm	Lecture
	Thu, Dec 1 @ 4 pm	Lecture
	Thu, Dec 1 @ 4 pm	Quiz: Module 10 (and photo of cheat-sheet)
14	Sometime between Dec 9 and 20 (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://academiccalendar.dal.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=117&chapterid=-1&topicgroupid=31821&loaduserredits=False>

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/undergrad-students/degree-planning.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.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>