Tropical Marine Biology Syllabus

Department of Biology

MARI 3682.03 Summer 2025

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
Dr. Margi Cooper	mhcooper@dal.ca	LSC 4130; By appointment
Nina Hamacher M.Sc.	nhamacher@dal.ca	By appointment

Course Description

This course provides a practical introduction to tropical marine biology, including a multi-day field trip to tropical marine ecosystems (reef, mangrove, seagrass). Identification of species, ecological interactions and tropical marine conservation will be discussed. Evaluation includes, but is not limited to, lecture and field tests, presentations, field observations and reports.

Course Prerequisites

BIOL 2003 and BIOL 2060 or equivalent courses; or Instructor's permission. An introductory course in statistics and familiarity with spreadsheets (e.g. Excel) will be useful.

Course Structure

This is an in-person, intensive course taking place between April 28-May 20, 2025. Students need to be available to meet Monday through Sunday from 9:35am-4:25pm while in Halifax. Lectures and labs will be held in LSC 4012. On the field trip, course activities will extend into the evening as well.

This course aims to provide students with a foundation in tropical marine biology and first-hand experience with related ecosystems in Belize. Students will learn through lectures, labs, readings, discussions, field exercises and a research project.

The first nine days will be spent in Halifax, with lectures and assignments focused on coral reef, seagrass, and mangrove habitats, as well as ecological interactions among these habitats. Species identification, marine conservation issues, and habitat monitoring protocols will also be emphasized. Students will participate in group discussions, labs, and have a field trip to the pool to become familiar with sampling protocols underwater. There will be a lecture examination the last day in Halifax.

In Belize, the class will be intense and meet all day (typically more than 8 hours per day). See the tentative schedule for details of each day's activities. Note that the schedule may need to be modified due to weather and other unforeseen circumstances. We will explore coral, seagrass, and mangrove ecosystems. Fish species will be visually sampled over patch reef, seagrass, and mangrove habitats as part of a class project. An additional component of the class project will involve monitoring levels of predation at our sampling sites. A Reef Species ID quiz will take place prior to this project.

Course Materials

Required articles to read for discussion will be posted on the course website.
REQUIRED TEXT: Humann, P., and N. DeLoach. 1995. Snorkeling Guide to Marine Life: Florida Caribbean Bahamas. New World Publications.
This text can be found on Amazon and Indigo.

Assessment

	Weight (% of total grade)	Date
Tests		
Lecture Exam	35	May 6
Reef Species ID Quiz	10	May 8
Class Project		
Report	25	May 20
Other		
Lab Activities	10	Various
Discussions	10	Various
Field Participation	10	Belize Trip
	100	

Lecture Exam
The class will have a test on lecture material before leaving on the trip to Belize and it will cover all the material from lectures. The exam will include multiple choice, short answer, and essay style questions.
Reef Species ID Quiz
While in Belize, a reef species ID quiz will assess students' ability to identify important components of the reef community prior to beginning the class project.
Discussions
Students will read and discuss articles relating to tropical marine biology/ecology. This assignment includes submitting discussion questions on the articles, prior to group discussion. Each student will lead one or more of these discussion sessions for their group.
Lab work
There will be three labs: 1) reef fish identification; 2) benthic cover identification; 3) sampling techniques and size estimation.
Field participation:
Participation is encouraged and required for full marks and is based on performance in the following categories: Attitude, Safety, Competence, Preparedness, Independence, and Professionalism.

Field project
In Belize, students will conduct a survey of fish diversity and size in areas of patch reef, seagrass, and mangrove around the caye. They will also monitor levels of predation at the same sites. Students will individually submit a full report of the class findings on the final day of the course.

Conversion of numerical grades to final letter grades follows the Dalhousie Grade Scale

Grade	Mark	Definition	
A+ A A-	90-100 85-89 80-84	Excellent	Considerable evidence of original thinking; demonstrated outstanding capacity to analyze and synthesize; outstanding grasp of subject matter; evidence of extensive knowledge base.
B+ B B-	77-79 73-76 70-72	Good	Evidence of grasp of subject matter, some evidence of critical capacity and analytical ability; reasonable understanding of relevant issues; evidence of familiarity with the literature.
C+ C C-	65-69 60-64 55-59	Satisfactory	Evidence of some understanding of the subject matter; ability to develop solutions to simple problems; benefitting from his/her university experience.
D	50-54	Marginal Pass	Evidence of minimally acceptable familiarity with subject matter, critical and analytical skills (except in programs where a minimum grade of 'C' is required).
F	0-49	Inadequate	Insufficient evidence of understanding of the subject matter; weakness in critical and analytical skills; limited or irrelevant use of the literature.

Course Policies

- It is important to keep up with work. Late assignments will be deducted at a rate of 10% per day. Once assignments have been marked and feedback returned to the class, late submission will no longer be allowed.
- Attendance is mandatory. Students are expected to attend all lectures, discussions, laboratories, and field trips. Deductions will be made for unexcused absences (1% per day or 0.5% per half day). Excused absences include those for sickness or emergencies, but do NOT include those due to work or attending other classes. Please contact the instructor about any absences as soon as possible.
- Students who do not engage fully in the pre-departure academic and organizational requirements may not be allowed to engage in the international travel portion of the course.
- Students are expected to participate and to cooperate in all class activities and follow rules at the field station, field trip locations and those provided by the guides. Deductions may be made for students who do not follow the rules and therefore put themselves and others at risk.
- Students MUST adhere to all safety guidelines presented. Whenever out of sight of the instructors or the field stations, students must stay in groups of 2 or more--AND inform the instructors of where they are going and when they plan to return. Life jackets will be worn at all times when travelling in boats. **For everyone's safety, consumption of alcoholic beverages, cannabis products, or other drugs is NOT permitted on the field trip.**

Course Policies related to Academic Integrity

You are expected to abide by Dalhousie University's policies on academic integrity.

The use of generative AI or large language models (e.g. ChatGPT) in this class would undermine your development of thinking and writing skills, and therefore will not be considered appropriate. Plagiarism will be checked by the detection software Turnitin.

Learning Outcomes

After this course, students will be able to:

- Identify a variety of marine organisms
- Quantify marine habitats and relate them to wildlife species
- Apply problem solving and research skills
- Discuss marine conservation issues as they pertain to Belize

Course Content - Schedule Is Tentative

Date	Day	Time	Activity
28-Apr	Mon	09:30-10:30	Introduction to the course (MC, NH)
		10:30-11:00	Lecture: Introduction to Mesoamerican Barrier Reef System (MC)
		11:00-12:00	Lecture: Coral reef habitat (MC)
		1:00-3:30	Lecture: Coral reef trophic linkages (MC)
29-Apr	Tues	9:30-10:30	**Discussion of article 1**
		10:30-12:00	Lecture: The Caribbean context (MC)
		1:00-2:00	Lecture: Ecosystem monitoring and population assessment (MC)
		2:00-4:00	**Lab: Reef fish identification (4%) - DUE 10AM May 3rd**
30-Apr	Wed	9:30-10:00	**Discussion of article 2**
		10:00-12:00	Lecture: Coral functional groups and benthic organisms (MC)
		1:00-2:30	Lecture: Structuring of the reef fish community (MC)
		2:30-4:00	**Lab: Benthic cover analysis (4%) - DUE 10AM May 3rd**
01-May	Thurs	9:30-10:00	**Discussion of article 3**
		10:00-12:00	Lecture: Data management and analysis (MC)
		1:00-3:00	**Dalplex Pool: Sampling protocols and fish size estimation (2%)**
		3:00-4:00	Work on Labs
02-May	Fri	9:30-10:00	**Discussion of article 4**
		10:00-11:00	Lecture: Seagrass habitat (MC)
		11:00-12:00	Lecture: Mangrove habitat (MC)
		PM	Work on Labs/Study for Exam
03-May	Sat	Off	Labs DUE 10 AM / Study for Exam
04-May	Sun	9:30-10:00	**Discussion of article 5**
		10:00-11:30	Lecture: Marine Protected Areas of Belize (NH)
		12:30-1:30	Lecture: Belize Fisheries: Lobster and Conch (NH)

		1:30-2:30	Lecture: Marine Mammals - Manatees and Bottlenosed Dolphins in Belize (MC)
05-May	Mon	9:30-10:00	**Discussion of article 6**
		10:00-11:00	Exam Review Q&A
		PM	Study for Exam
06-May	Tues	9:30-12:30	**Lecture Exam (35%)**
		PM	Final preparations and packing
07-May	Wed		Halifax to Overnight Destination
08-May	Thurs	AM	Overnight Destination to Billy Hawk
		PM	Snorkel orientation / Prepare Gear
		Evening	**Reef Species ID Quiz (10%)**
09-May	Fri	AM	Squidpop assay and transects - Seagrass
		PM	Squidpop assay and transects - Mangrove
		Evening	Data entry and gear prep; debrief
10-May	Sat	AM	Squidpop assay and transects - Patch Reef
		PM	Squidpop assay and transects - Seagrass
		Evening	Data entry and gear prep; field participation interviews
11-May	Sun	AM	Squidpop assay and transects - Mangrove
		PM	Squidpop assay and transects - Patch Reef
		Evening	Data entry; field participation interviews
12-May	Mon	AM & PM	Glover's Reef Atoll
		Evening	Drumming and goodbye dinner
13-May	Tues		Billy Hawk to Tropical Education Centre and tour the Belize Zoo
14-May	Wed		Belize City to Overnight Destination
15-May	Thurs		Overnight Destination to Halifax
16-May	Fri		Off
17-May	Sat	9:30-12:00	Tutorial - Data analysis
18-May	Sun		Independent Project work
19-May	Mon		Independent Project work
20-May	Tues	11:59PM	**Report due (25%)** - Submit via Brightspace

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. Additional information regarding the Indigenous Student Centre can be found at: 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

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) 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

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

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/about/leadership-governance/academic-integrity/faculty-resources/ouriginal-plagiarism-detection.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.