

Faculty of Science Course Syllabus (Section A) (revised June 2021)
Department of Oceanography

BIOL 3003 / MARI 3003 / OCEA 3003
Introduction to Field Oceanography
Summer 2022

July 25 – August 10, Mon-Sat 08:00-17:00

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

Instructor(s):	Craig J. Brown	craig.brown@dal.ca
TA:	TBD	
Lectures:	6 x 4 hr sessions	LSC-BIOL&EARTH B4012
Laboratories:	10 x 4 hr sessions	LSC-BIOL&EARTH B4012
Field:	10 x 4 hr sessions	Jubilee Road Pier
Course delivery:	In Person	

Course Description

This hands-on course introduces the fundamentals of science at sea through a small field research project. We use common oceanographic instruments and methods to collect data and samples during day trips in local waters. Samples and data are analyzed back in the lab to explore relationships between marine organisms and their environment.

Course Prerequisites

This course is intended for 3rd and 4th year undergraduates. Prerequisites for the course include introductory oceanography courses (e.g., OCEA 2001 and 2002 – The Blue Planet I & II) or other introductory courses in natural sciences.

Learning Objectives

1. Operate common oceanographic instruments and equipment safely and effectively at sea to collect samples and data.
2. Analyse oceanographic samples and data in the lab using common techniques and protocols.
3. Apply concepts introduced in lecture to interpret data from samples.
4. Explore and synthesize data to identify trends and draw conclusions.
5. Present results of work clearly and concisely in written format using figures and tables.
6. Compare data and conclusions with published literature to provide greater context.
7. Assess quality of work completed to provide limitations and identify areas for improvement.
8. Offer detailed suggestions for future work based on gaps in knowledge.
9. Think like an oceanographer.

Course Structure

Class meets for 14 consecutive Monday through to Saturday. Class lasts the entire day and is split into a morning and afternoon session, each lasting about four hours with breaks. Every effort will be made to allow at least one hour for lunch between sessions. Sessions are spent either in the field, in the lab, or at a lecture. When out on the water, we operate on a small vessel in Halifax Harbour and Bedford Basin, and students use a variety of instruments to collect data and samples. Back in the lab, students analyze the samples collected and workup their data. Lectures provide background information necessary to interpret the data and discuss implications for the marine ecosystem. Students present their work in group-written scientific manuscript that is the main assessment component.

Course Materials

- There is no required text for this course.
- Students must have access to a computer. Course materials and data will be shared online and there are two online exams.
- Dress appropriately for field activities and bring drinking water. Be prepared for the weather because there is limited shelter on the boat. Closed-toe shoes required.

Course Assessment

Component	Weight (% of final grade)	Date
Participation	26%	2% per day (except last day)
Exams	24%	various – see below
Research Paper	50%	August 10, 2022 by midnight ADT

Participation

Students will be assessed on their active involvement in field and laboratory activities as well as lecture discussion. Attendance is mandatory! Because the class is largely experiential and make-ups are not feasible, no participation points will be given to absent students. SDA is not allowed.

Exams

Students will be tested on course content from both lecture and field sessions. All exams are to be completed individually.

Exam Weight	(% final grade)	Format	Due Date
Safety	5%	online	Complete by midnight ADT, Aug 10
Knots	4%	oral	Complete during any field session
Lecture	15%	online	Complete by midnight ADT, Aug 10

Research Paper

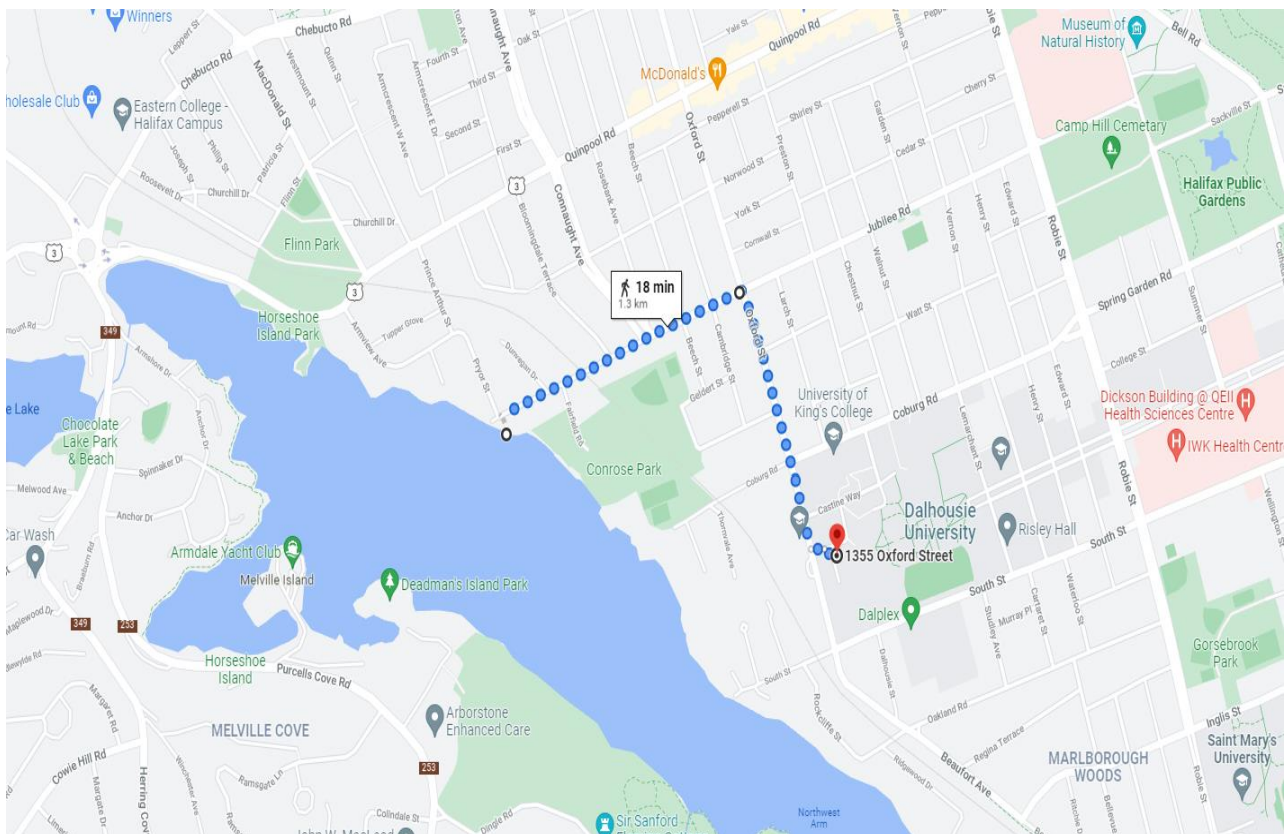
Students will be assessed on their contribution to a group-written scientific research paper. The paper will include data collected during the course and use cited primary literature to provide context. Papers must be submitted on Brightspace in PDF format. Documents regarding content and format requirements will be reviewed in class and available on Brightspace.

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 on Missed or Late Academic Requirements

- Wear PPE and safety gear when instructed.
- No drug or alcohol impairment during class. Please notify the instructor if a prescription medicine may cause impairment.
- Inform the instructor if you cannot swim.
- Inform the instructor of any absence as soon as possible.
- Late papers are penalized by 10% per day. No late papers will be accepted after August 14, 2022.
- Students are responsible for their own transportation to the boat. The boat typically departs from Jubilee Pier (see map below), which is an ~ 15 min walk from the Dal LSC building. We may occasionally depart from the Halifax waterfront.



Provisional Course Schedule (this may change based on weather and vessel/equipment logistics)

Date	Day	Session	Type	Activity/Topic
25 July	M	AM	Lecture	Course introduction, select groups, nautical terminology, marine safety
		PM	Lab	Research paper assignment review, HFX Harbour background
26 July	T	AM	Field	Vessel intro, safety, knots, echosounder
		PM	Field	CTD casts, Secchi disk
27 July	W	AM	Lecture	Physical measurements (T, S, P, acoustics), seafloor mapping
		PM	Lab	Bathymetry mapping and CTD data plotting
28 July	Th	AM	Field	Deploy sediment traps, Benthic camera surveys
		PM	Field	Benthic grab samples
29 July	F	AM	Lecture	Benthic ecology and sampling methods
		PM	Lab	Infaunal analysis
30 July	Sat	AM	Lab	Subsea video analysis
		PM	Lecture	Primary production, respiration and grazing
1 Aug				NATAL DAY – No Class
2 Aug	T	AM	Field	Deploy incubation moorings, water sampling (phytoplankton, pigments), plankton net tows
		PM	Lab	Plankton microscopy
3 Aug	W	AM	Field	Recover incubation moorings, Deployment of Baited Remote Video Systems
		PM	Lab	Pigment analysis, incubation analysis
4 Aug	Th	AM	Field	Recover Baited Remote Video Systems, Multicore sampling
		PM	Lecture	Marine geology and sediment biogeochemistry
5 Aug	F	AM	Field	Recover sediment traps, Multicore sampling
		PM	Lab	Grain size analysis
6 Aug	Sat	AM	Lab	Baited Remote Video data analyses
		PM	Lab	Sediment trap filtering, sediment core processing
8 Aug	M	AM	Lecture	Vertical flux, marine carbon cycle
		PM	Lab	Marine chemistry, ocean technology and marine robotics
9 Aug	T	AM	Field	Fish sampling, passive acoustics
		PM	Field	McNabs Island, swimming
10 Aug	W	AM/PM	OPEN CLASS	Work on manuscripts, DUE before midnight ADT

SECTION B: UNIVERSITY POLICIES, STATEMENTS, GUIDELINES and RESOURCES for SUPPORT

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

SECTION B: 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>