

Tools & Concepts in Ocean Sciences I

Syllabus

Department of Oceanography
OCEA 2020.03 Fall 2023

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 Instructors

Name	Email	Office Hours Office
Laura deGelleke (prof)	laura.degelleke@dal.ca	W 13:30-14:30 LSC O3627E
Jay Kirkham (marker)	jkirkham@dal.ca	W 14:00-16:00 LSC O4677

Labs: Section 01 – Mondays (Sep 11 – Dec 5) @ 11:35-14:25 in LSC B4012

Section 02 – Fridays (Sep 8 – Dec 1) @ 11:35-14:25 in LSC B4012

Tutorials: All sections – Wednesdays (Sep 6 – Dec 6) @ 12:30-13:30 in LSC C220

Course Description

Students gain practical insights into oceanographic concepts introduced in OCEA 2001.03/2002.03 through lab exercises. Labs focus on navigation and position, instruments and calibration, ocean optics and acoustics, water movement, and basic marine chemistry. Labs involve data acquisition and analyses to develop quantitative skills. Students will become familiar with the 'R' programming language.

Course Corequisites

- OCEA 2001.03

Course Prerequisites

- MATH 1000.03; MATH 1060.03/STAT 1060.03 (or MATH 2060.03/STATS 2060.03)
- PHYC 1190/1290.03 (or PHYC 1310.03/1320.03 or PHYC 1300.06)
- at least one of: CHEM 1011.03/1012.03, EARTH 1080.03/1090.03, or BIOL 1010/1011 (or BIOL 1020.03/1021.03)

Course Structure

Class meets once a week for three hours. Class begins with a short presentation and the remaining class time is spent completing lab activities. There is an assignment each week, and students have a minimum of one week to complete each assignment. Tutorials are held weekly to assist with data analysis and assignments.

Course Materials

This class uses a custom lab manual provided at no additional cost. The manual is available to download on Brightspace. Brightspace will also be used to make announcements as well as provide lab manuals, assigned readings, data, and more. Students are responsible for any printing of the supplied material. Students will need a lab notebook for the course.

Assessment

Assignments

There is an assignment associated with each lab activity that is typically due on the date of the next class meeting. **Assignments are submitted on Brightspace and are always due by 11:30 on the due date.** Assignments are one of two types: exercises or reports. Exercises are short-answer problem sets that use data and/or build on concepts from lab activities. Reports are formal lab reports on the lab activities. A lab report format and guidelines document is available on Brightspace. Late assignments are a subject to penalty.

Lab Notebooks

Students are required to use lab notebooks to record notes during lab activities. Lab notebooks will be checked in-class on 4 undisclosed dates during the term. A lab notebook format and guidelines document is available on Brightspace. There will be no late notebooks checks.

Component	Weight (% of final grade)	Due Date
Assignments	90% (11 total)	weekly
Exercises	60% (8 total, 7.5% each)	lab 1, 2, 3, 5, 7, 9, 10, 11
Reports	30% (3 total, 10% each)	lab 4, 6, 8
Lab Notebook	10%	in-class, 4 random dates

Conversion of numerical grades to final letter grades follows the [Dalhousie Grade Scale](#)

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (0-49)
A- (80-84)	B- (70-72)	C- (55-59)	

General Course Policies

1. Allow 24-48 *weekday* hours for replies to emails. I will try, but I cannot guarantee a quicker response time.
2. No open-toed shoes in lab.
3. Properly wear PPE when instructed to do so.
4. If you want an extension on a due date, request one via email to your instructor (cc marker). Make your request in advance of the due date, briefly provide a reason, and suggest a revised due date. In general, requests that are *received* on the actual due date are not approved.

Course Policies on Missed or Late Academic Requirements

5. The late penalty is 5% for the first day (24 hours) and doubles every day after including weekends.
6. You must attend lab to complete an assignment for that lab (unless another arrangement has been made in advance).
7. You may submit a maximum of 2 Student Declaration of Absence (SDA) forms per term for short-term absences of 3 days or less.
8. SDA forms must be completed and submitted on Brightspace before the class meeting or deadline that will be missed.
9. There are no make-up labs, even with an SDA. Students that submit a valid SDA will be exempt from assignments associated with any missed labs, which will increase the grade weight of all other assignments in that category equally.
10. SDA forms give you a maximum of 3 additional days to submit assignments. You must submit any missed assignments by 3 days after the original due date. You will not be reminded of this revised due date and late penalties will begin after 3 days.
11. Absences longer than 3 days will be handled on a case-by-case basis.

Course Policies related to Academic Integrity

12. You may discuss material and exchange ideas with others, but you must submit individual, original work not generated by AI.

Learning Objectives

This is a laboratory class and focuses on how we study the ocean and interpret data as ocean scientists. By the end of the course, you should be able to:

1. Demonstrate basic laboratory skills and knowledge of laboratory safety.
2. Operate and calibrate various laboratory instruments.
3. Perform laboratory analyses using common techniques and protocols.
4. Synthesize data and identify trends.
5. Apply concepts introduced in the classroom to interpret data collected or provided.
6. Present results from laboratory activities in written format using figures and tables.
7. Compare your data with data collected by another and/or cited in peer-reviewed journals.
8. Predict outcomes of experiments using results of previous studies.
9. Assess efficacy of laboratory activities and offer suggestions for future work.
10. Appreciate the breadth of techniques and instruments used to study the ocean.

Course Content

Section 01 – Mondays

Lab #	Lab Topic	Lab Date	Assignment Due	Assignment Type
2	Dealing with Data	11-Sep	18-Sep	Exercise
3	Sensors I	18-Sep	25-Sep	Exercise
4	Sensors II	25-Sep	09-Oct	Report
	NO CLASS	02-Oct	--	--
	NO CLASS	09-Oct	--	--
5	Light in the Ocean	16-Oct	23-Oct	Exercise
6	Sound in the Ocean	23-Oct	30-Oct	Report
7	Convection & Mixing	30-Oct	06-Nov	Exercise
8	Waves	06-Nov	20-Nov	Report
	NO CLASS	13-Nov	--	--
9	Coriolis	20-Nov	27-Nov	Exercise
10	Basic Seawater Chemistry	27-Nov	04-Dec	Exercise
11	Dissolved Oxygen	04-Dec	11-Dec	Exercise
1	Navigation & Position	05-Dec	12-Dec	Exercise

Section 02 – Fridays

Lab #	Lab Topic	Lab Date	Assignment Due	Assignment Type
2	Dealing with Data	08-Sep	15-Sep	Exercise
3	Sensors I	15-Sep	22-Sep	Exercise
4	Sensors II	22-Sep	06-Oct	Report
1	Navigation & Position	29-Sep	13-Oct	Exercise
	NO CLASS	06-Oct	--	--
5	Light in the Ocean	13-Oct	20-Oct	Exercise
6	Sound in the Ocean	20-Oct	27-Oct	Report
7	Convection & Mixing	27-Oct	03-Nov	Exercise
8	Waves	03-Nov	17-Nov	Report
9	Coriolis	10-Nov	24-Nov	Exercise
	NO CLASS	17-Nov	--	--
10	Basic Seawater Chemistry	24-Nov	01-Dec	Exercise
11	Dissolved Oxygen	01-Dec	08-Dec	Exercise

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/dept/university_secretariat/policies/academic/student-submission-of-assignments-and-use-of-originality-checking-software-policy-.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.