

**Faculty of Science Course Syllabus
Department of Biology
BIOL/MARI 3221.03**

Seaside 2023- Diversity of Algae

Parts of this course may be altered depending on availability due to the health and safety regulations in place at the time.

Instructor(s): Beverly Hymes (Beverly.Hymes@dal.ca); Dr. Herbert Vandermeulen

My name is Bev Hymes, I am the lead instructor for this course. I studied algal ultrastructure under Professors K. Cole (University of British Columbia) and T. Sawa (University of Toronto). Dr. Herb Vandermeulen (a retired macrophyte ecologist from the Bedford Institute of Oceanography) co-wrote many of the lectures with me. Some of our material was adapted from lectures developed by Drs. Ellen Kenchington and Bob DeWreede; we thank them for allowing us to incorporate some of their material. We may have guest lecturers as well.

Course Demonstrator: TBA

Course Dates: Wednesday. April 26 – Sunday. May 14, 2023;

Monday – Sunday 10:05AM – 5:25 PM

There will be breaks throughout the day and schedule may vary due to field trips and guest lectures. There may be some unscheduled days during the week.

Lectures: 10:05 – 12:25 AM LSC 2102

Laboratories: 13:25 – 17:25 PM LSC 2102

Field Trips: There will be three field trips throughout the course. Rain or shine!! We will depart from the King's/Biology parking lot area at the scheduled time. See below for more information on field trips (i.e. what to bring, etc.).

Course Description

This class is a taxonomic introduction to the major algal groups (macrophytic and microscopic) with an emphasis on the marine seaweeds. Basic taxonomic differences will be covered, along with an introduction to macrophyte ecology, human uses and symbioses. Laboratory sessions will focus on morphology and reproduction. You will learn to identify the major algal groups based upon recognition characteristics and create your own herbarium collection and slides. A major focus of this course will be the field identification of a set list of Nova Scotian seaweeds.

Credit hours: 3

Course Prerequisites

BIOL 2004.03 or equivalent CROSS-LISTING: MARI 3221.03

EXCLUSIONS: BIOL 3212.03, MARI 3212.03

Course Objectives/Learning Outcomes

After completing the course, students will have skills in the use of taxonomic keys and algal identification, and knowledge of the general biology of the main algal groups plus some aquatic macrophytes.

Course Materials

The following books are optional, but very useful:

Graham J.W., Lee W. and Graham L.E. 2009. ALGAE. 3rd ED. This edition of Algae is only available in an eBook format to keep costs down (and allow them to include color images). \$40 (USD) for the 595 page eBook is a fair price for students. You are able to download and keep your book.

Books can be ordered from: www.ljlmpress.com/algae.html

Either a PayPal account or a credit card can be used. Please note that Prof Wilcox has requested that “We realize that not all students will buy a book, as often seems to be the case these days, and we’re not asking instructors to act as cops, of course, but if you’d be willing to suggest to students that they not share files, that would be much appreciated.”

There are two other books that are very useful field guides:

Duane J. 2008. A Photographic Guide to Seashore Life in the North Atlantic: Canada to Cape Cod. Princeton University Press, NJ. ISBN: 978-0-691-13319-5. 224 pp. Softcover.

Villalard-Bohnsack M. 2003. Illustrated Key to the Seaweeds of New England. The Rhode Island Natural History Survey, Kingston, Rhode Island. ISBN: 1-887771-07-7. 149 pp. Softcover. – copies of this reference book are provided for the lab

Attendance: Attendance is mandatory unless a VALID REASON is given. Attendance will be taken every day.

Lectures: The Brightspace system will be used to post lectures and lab outlines for the course – there is a links section as well. **It is a good idea to print out all the labs before the first lecture.**

Course Assessment (subject to change depending upon availability of drying oven and plant presses)

Component	Weight (% of final grade)	Date
Exams	Mid-term lecture exam - 30%	May 7, 2023
	Lab exam (includes all labs and field trips) - 25%	May 12, 2023

	Final Lecture exam 20%	May 13, 2023
Assignment	Herbarium project (yours to keep after marking) - 15%	May 14, 2023 at 5PM
Algal identification Quiz	5%	April 30, 2023
Algal identification Quiz	5%	May 1, 2023

Other course requirements

Attendance: Attendance is mandatory unless a VALID REASON is given. Attendance will be taken every day.

Herbarium Project: must be handed in to pass the course

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

In order to pass this course, attendance is mandatory, all exams need to be written and your project must be handed in.

Course Content

What to expect and what you will need for field trips:

Expect to get wet and muddy. We will be outside in all kinds of weather – be prepared for both cold and warm conditions – layer up!

Washroom facilities may not be available on all field trips. Be prepared!

Field trips are fun but you must stay focused:

- No texting or cell phone use
- You must work in groups and stay within the area designated by the instructors – you cannot wander off, this is a safety issue.
- You must be constantly vigilant for waves and water motion.
- For your safety, alcoholic beverages and recreational drugs are not permitted on field trips.

What you need to bring:

- **NOTE:** Shoes or rain boots are mandatory (*no flip flops!*). We will be walking in wet and muddy areas. **No bare feet will be allowed – this is a safety issue!**
- Rain gear (if weather is wet)
- Spare socks
- Hat
- ****If you have a compact life jacket that fits you, please bring it**** - this is a safety issue for working in the low intertidal on an exposed shore
- A snack and something to drink; We should have time for food at Peggy's Cove



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- Clipboard, paper and pencils to make notes OR (better) bring a small engineering style notebook (the type with waterproof paper) and pencils
- A backpack for personal items

What the course will bring:

- Collecting bags and labels, pencils and waterproof markers
- Paint scrapers (to scrape algae off rocks at holdfast point)
- Coolers (to transport collected algae back to lab for sorting)

What you will do:

- Write down your observations (there will be some questions on a lab exam related to the field trips). You will be documenting the algal zonation of a shore on a taxonomic basis.
- Collect several plants for later sectioning and herbarium sheet preparation back in the lab.

Tentative Schedule- Subject to change based on lectures and guest lecture availability

Schedule and field trip details subject to change based on COVID-19 health and safety recommendations in place at the time.

Date	Time	Activity
Wed. April 26, 2023	10 am	Lecture: Introduction; Classification and Phylogeny; Morphology and Ecological Categories; Cyanobacteria and Glaucophyta
	1:25 pm	Lab: Intro to lab techniques (herbarium sheets & slides); *Cyanobacteria and Glaucophyta- will look at cultures from Aquatron, some later from Carolina Biol.
Thurs. April 27	10 am	Lecture: Rhodophyta; start Rhodophyta lab
	1:25 pm	Lab: continue Rhodophyta lab; start herbarium sheet assignment
Fri. April 28	10 am	Lecture: Introduction to Stramenopiles: Phaeophyceae
	1:25 pm	Lab: finish Rhodophyta lab; Phaeophyceae; herbarium sheets and slides
Sat. April 29	10 am	Lecture: Dispersal & Introduced Seaweeds; Biogeography
	1:25 pm	Lab: Review life histories; finish Phaeophyceae; herbarium sheets and slides; Chlorophyta seaweeds (mini-lecture and lab)

Sun. April 30	10 am	Lecture: Guest lecture: Dr. David Garbary or Dr. Vandermeulen or Commercial Algae I: Natural Harvest and Aquaculture
	1:25 pm	Lab: Algae keys quiz (5%) ; work on seaweeds
Mon. May 1	10 am	Lecture: Guest lecture: Dr. David Garbary or Dr. Vandermeulen or Commercial Algae I: Natural Harvest and Aquaculture
	1:25 pm	Lab: Algae keys quiz (5%) Field trip Movie and prep talk; work on seaweeds
Tue. May 2	9 am	Field trip: Peggy's Cove (D'Aubins Cove) Low tide approx. 11:44 AM, 0.4m
Wed. May 3	10 am	Work on seaweeds collected and review
Thurs. May 4	11 am	Field trip: Conrads Beach and Eastern Passage Low tide approx. 1:03 PM, 0.4m
Fri. May 5	10 am	Work on seaweeds collected and review
	1:25 pm	Work on seaweeds collected and review
Sat. May 6	10 am	Study and review; work on seaweed assignment
Sun. May 7	1:00 pm	Lecture midterm exam – 30% (all lecture material covered so far up to and including Commercial Algae I)
Mon. May 8	9 am	Field trip: NRC, Sandy Cove; Belchers Marsh; Public Gardens?
	2:00 pm	Lecture/Lab: Stramenopiles II - Diatoms; Chrysophytes and Xanthophytes*; (Cyanobacteria from Carolina Biol); Stramenopiles II Diatoms etc.
Tue. May 9	10 am	Lecture: Euglenophyta; Cryptophyta; Haptophyta; Chlorophyta
	1:25 pm	Lab: Euglenophyta, Cryptophyta, Haptophyta, Chlorophyta
Wed. May 10	10 am	Lecture: Chlorophyta with FW emphasis; Symbiosis; Seagrasses
	1:25 pm	Lab and Guest lecture: Cheryl Refuse; HAB (Harmful Algal Blooms); Dinophyta
Thurs. May 11	9 am	work on herbarium sheets and slides; review for lab exam

Fri. May 12	1:00 pm	Lab exam (25%)
Sat. May 13	10 am	Final lecture exam (20%) (from Stramenopiles II to last lecture)
	1:00	Lecture & Lab: Commercial Algae II and Food Lab; finish herbarium assignment
Sun. May 14		Herbarium sheets and slides handed in by 5 pm (10%) Lab exam (25%)

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/servicessupport/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-toget-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>