

BIOL/MARI 3221 DIVERSITY OF ALGAE, SEASIDE Summer 2017

Date and time: April 27 – May 26, 2017: Monday - Friday 9-5pm. 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.

Instructors: Beverly Hymes and Dr. Herbert Vandermeulen (Research Scientist, Bedford Institute of Oceanography)

Beverly.Hymes@dal.ca

Assistant: TBA

Lectures and labs: Lec- LSC B2102 (9:05 – 11:55am) or in the lab; Lab- LSC B2102 (13:05 – 16:55). Lecture and lab times will vary.

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

BIOL/MARI 3221 Diversity of Algae

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.

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.**

CREDIT HOURS: 3

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, James, Wilcox, Lee W. and Graham, Linda E. 2009. *ALGAE*. 2nd ED. Prentice Hall, NJ. ISBN:0321559657. 720pp. Hardcover.

NOTE: Prof Wilcox has allowed us access to the **new 3rd edition** online. The new edition of *Algae* is only available in an eBook format to keep costs down (and allow us 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 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 available in the bookstore 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, Martine. 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.

Evaluation:

Lectures- There will be two exams: first midterm worth 20% and the final exam worth 25% - The final exam will be cumulative.

Labs- There will be one final lab exam on all the labs and field trips worth 20% and your own herbarium collection worth 25%.

Attendance & participation- 10%

Grading scheme: This course follows the grading scheme of core Biology classes:

A+ (90-100) C+ (65-69)

A (85-89) C (60-64)

A- (80-84) C- (55-59)

B+ (77-79) D (50-54)

B (73-76) F <50

B- (70-72)

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.

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 lunch at Peggy's Cove
- 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

| Date | Time | Activity |
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| Thurs. Apr. 27 | 9 am | Lecture: Introduction to class; Classification and Phylogeny; Morphology and Ecological categories; Cyanobacteria and Glaucophyta |
| | 1 pm | Lab: Intro to lab techniques; Cyanobacteria and Glaucophyta; Pond visit? |
| Fri. Apr. 28 | 9 am | Lecture: Rhodophyta; start Rhodophyta lab |
| | 1 pm | Lab: continue Rhodophyta; sort and begin to make herbarium sheets and permanent slides |
| Sat. Apr. 29 | Day off | Review |
| Sun. Apr. 30 | Day off | Review |

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| Mon. May 1 | 9 am | Lecture: Chlorophyta (seaweeds only), Intro to Stramenopiles |
| | 1 pm | Lab: Rhodophyta; Chlorophyta; review life cycles |
| Tues. May 2 | 9 am | Lecture: Phaeophyta |
| | 1 pm | Lab: Phaeophyta; Field Trip Movie and prep talk |
| Wed. May 3 FIELD TRIP | 6 am | Field trip: Peggy's Cove (D'Aubins Cove) Low tide approx. ~9:30 AM, 0.28m (brunch at Peggy's Cove) |
| Thurs. May 4 | 10 am | Lecture: review life cycles; work on collection |
| | 1 pm | Lab: work on collection |
| Fri. May 5 | 9 am | Lecture: Stramenopiles II :diatoms,chrysophytes,tribophytes |
| | 1pm | Lab: Stramenopiles; diatoms etc, work on collection, Conrad's Beach talk |
| Sat. May 6 | Day off | Review |
| Sun. May7 | Day off | Review |
| Mon. May 8 FIELD TRIP | 10:30am – 6:00pm | Field trip: Conrad's Beach, Lawrencetown Beach Low tide approx. 1:53 PM, 0.38m (early supper gov't wharf) |
| Tues. May 9 | 10 am | Lecture: Review and work on collection |
| | 1 pm | Lab: work on collection |
| Wed. May 10 | 10 am | Lecture: review for midterm exam |
| Thurs. May 11 | 10 am | Lecture midterm exam – 20% (all material covered so far up to and including Phaeophyta) |
| | 1 pm | Lecture: Cryptophyta, Haptophyta; Work on collection |
| Fri. May 12 | 9 am | Lecture: Guest lecture – ?Cheryl Rafuse; Dinophyta; Euglenophyta |
| | 1 pm | Lab: Dinophyta, Euglenophyta Cryptophyta, Haptophyta; Work on herbarium sheets and slides; |
| Sat. May 13 | Day off | Review |

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| Sun. May 14 | Day off | Review |
| Mon. May 15 FIELD TRIP | 9 am | Field Trip: tour of NRC Sandy Cove (Dr. Pat McGinn) and Belcher's Marsh (Clayton Park) |
| Tues. May 16 | 10am | Lecture: Chlorophyta (freshwater); Symbiosis |
| | 1 pm | Lab: Chlorophyta (freshwater); work on projects |
| Wed. May 17 | 10 am | Lecture: Propagule Dispersal; Introduced Species |
| | 1 pm | Lab: review; work on herbarium sheets and slides |
| Thurs. May 18 | 10am | Lecture: Biogeography; Vascular Macrophytes |
| | 1pm | Lab: review; work on herbarium sheets and slides |
| Fri. May 19 | | Commercial Algae: Natural Harvest and Aquaculture |
| | | Lab: review; work on herbarium sheets and slides (labels) |
| Sat. May 20 | Day off | Review |
| Sun. May 21 | Day off | Review |
| Mon. May 22 Victoria Day | | NO CLASSES |
| Tues. May 23 | 10 am | Review and projects (labels) |
| Wed. May 24 | 10 am | Review; lab closed at 2 pm |
| Thurs. May 25 | 10 am | Lab exam (20%) |
| Fri. May 26 | 9:00am | Final lecture exam (25%) |
| | 12:15 pm | Lecture: Economic Uses & Food Lab Herbarium sheets and slides handed in by 5 pm (25%) |

ACCOMMODATION POLICY FOR STUDENTS

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic protected under Canadian Human Rights legislation. The full text of Dalhousie's Student Accommodation Policy can be accessed [here](#):

http://www.dal.ca/dept/university_secretariat/policies/academic/student-accommodation-policy-wef-sep--1--2014.html

Students who require accommodation for classroom participation or the writing of tests and exams should make their request to the **Advising and Access Services Centre (AASC)** prior to or at the outset of the regular academic year. More information and the ***Request for Accommodation*** form are available at www.dal.ca/access.

ACADEMIC INTEGRITY

Academic integrity, with its embodied values, is seen as a foundation of Dalhousie University. It is the responsibility of all students to be familiar with behaviours and practices associated with academic integrity. Instructors are required to forward any suspected cases of plagiarism or other forms of academic cheating to the Academic Integrity Officer for their Faculty.

The Academic Integrity website (<http://academicintegrity.dal.ca>) provides students and faculty with information on plagiarism and other forms of academic dishonesty, and has resources to help students succeed honestly. The full text of Dalhousie's ***Policy on Intellectual Honesty*** and ***Faculty Discipline Procedures*** is available here:

http://www.dal.ca/dept/university_secretariat/academic-integrity/academic-policies.html

STUDENT CODE OF CONDUCT

Dalhousie University has a student code of conduct, and it is expected that students will adhere to the code during their participation in lectures and other activities associated with this course. In general:

“The University treats students as adults free to organize their own personal lives, behaviour and associations subject only to the law, and to University regulations that are necessary to protect

- the integrity and proper functioning of the academic and non – academic programs and activities of the University or its faculties, schools or departments;
- the peaceful and safe enjoyment of University facilities by other members of the University and the public;
- the freedom of members of the University to participate reasonably in the programs of the University and in activities on the University's premises;
- the property of the University or its members.”

The full text of the code can be found here:

http://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

SERVICES AVAILABLE TO STUDENTS

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise, are free.

| Service | Support Provided | Location | Contact |
|-----------------------------------|---|---|---|
| General Academic Advising | <p>Help with</p> <ul style="list-style-type: none"> - understanding degree requirements and academic regulations - choosing your major - achieving your educational or career goals - dealing with academic or other difficulties | <p>Killam Library Ground floor</p> <p>Rm G28</p> <p><i>Bissett Centre for Academic Success</i></p> | <p>In person: Killam Library Rm G28</p> <p>By appointment:</p> <ul style="list-style-type: none"> - e-mail: advising@dal.ca - Phone: (902) 494-3077 - Book online through MyDal |
| Dalhousie Libraries | <p>Help to find books and articles for assignments</p> <p>Help with citing sources in the text of your paper and preparation of bibliography</p> | <p>Killam Library Ground floor</p> <p>Librarian offices</p> | <p>In person: Service Point (Ground floor)</p> <p>By appointment:</p> <p>Identify your subject librarian (URL below) and contact by email or phone to arrange a time:</p> <p>http://dal.beta.libguides.com/sb.php?subject_id=34328</p> |
| Studying for Success (SFS) | <p>Help to develop essential study skills through small group workshops or one-on-one coaching sessions</p> <p>Match to a tutor for help in course-specific content (for a reasonable fee)</p> | <p>Killam Library 3rd floor</p> <p>Coordinator</p> <p>Rm 3104</p> <p>Study Coaches</p> <p>Rm 3103</p> | <p>To make an appointment:</p> <ul style="list-style-type: none"> - Visit main office (Killam Library main floor, Rm G28) - Call (902) 494-3077 - email Coordinator at: sfs@dal.ca or - Simply drop in to see us during posted office hours <p>All information can be found on our website: www.dal.ca/sfs</p> |

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| Writing Centre | <p>Meet with coach/tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster)</p> <ul style="list-style-type: none"> - Learn to integrate source material into your own work appropriately - Learn about disciplinary writing from a peer or staff member in your field | <p>Killam Library Ground floor Learning Commons & Rm G25</p> | <p>To make an appointment:</p> <ul style="list-style-type: none"> - Visit the Centre (Rm G25) and book an appointment - Call (902) 494-1963 - email writingcentre@dal.ca - Book online through MyDal <p>We are open six days a week</p> <p>See our website: writingcentre.dal.ca</p> |
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