



Faculty of Science Course Syllabus
Department of Biology
BIOL 3219.03
Flora of Nova Scotia
Summer 2018

Instructor: Marian Munro nsplants2018@gmail.com

Course dates: The course will run from July 23, 2018 until August 10, 2018 (Monday through Friday, except Monday August 6, 2018 - Natal Day Holiday).

Lectures: 9:05-11:55 AM Room: LSC 334

Laboratories: 1:05-4:55 PM Room: LSC 2102

Field trips: Schedules on field trip days may deviate from the lecture and lab schedule shown above. See tentative schedule for dates, times and locations. Field trips meet vans or bus in the parking area between the Biology entrance to the LSC and Kings.

Course Description

Hands-on introduction to the plants of Nova Scotia, with an emphasis on taxonomy and a focus on the flowering plants. Includes identification, morphology, distribution, habitat, ecology, and values. Takes several day-long and half-day field trips. Evaluation includes a plant collection, field notebook, field report, presentation, and lecture and lab exams.

Course Prerequisites

BIOL 2004.03 and BIOL 2060.03 or equivalents.

Learning Outcomes

By the end of this course students will be able to:

1. Use a dichotomous key to identify herbaceous and woody plant species native to Nova Scotia.
2. Know the morphology, distribution, habitat, ecology and value of many native species.
3. State, define, and give examples of the components of taxonomy, including the description, identification, nomenclature, and classification.
4. Describe a plant using the descriptive terminology of plant morphology, anatomy, embryology, palynology and reproductive biology.
5. Name, classify, and diagnose several of the major families of flowering plants.
6. Learn how to collect, identify and process plants for herbarium specimens.
7. State the principles and rules of plant nomenclature, including how to publish a new taxon name, and how to use and apply botanical names.

Long after this course is over you may forget many details of the material, however, there are some aspects that we hope will serve you throughout your life:

1. Appreciate the beauty and intricacy of plants and enjoy discovering things about nature.
2. Improve your skills in memory, observation, writing, and critical thinking.
3. Gain base knowledge of the structure, function and evolutionary history of plants.

Required Equipment

1. Hand Lens (10x magnification). Purchase at the Dal Bookstore or check out from SEASIDE.
2. Trowel (check out from SEASIDE).
3. Ring Binder for your herbarium (2-3 inch).
4. White liquid glue for mounting your plants. Any kind will do as long as it dries clear.
5. Camera or phone to take photos on field trips.

Suggested Resources (Optional)

1. *The Flora of Nova Scotia* by A.E. Roland and E.C. Smith (1969). Hard copy available from the Reference and Research Services Room (3621) of the Killam Library (cost \$36, cash only). Can download the pdf of the book (250 Mb in 4 parts) from Killam library services.
2. *Nova Scotia Plants* by M.C. Munro, R.E. Newell and N.M. Hill (2014). Available as a free download at <https://ojs.library.dal.ca/NSM/pages/view/Plants>
3. *How to Identify Plants* by H.D. Harrington (1957). Available through the Dalhousie Bookstore and Amazon.ca.
4. *Useful Nova Scotia Plants* and *Harmful Nova Scotia Plants* (free apps for IOS and Android) *Forest Ecosystem Guide to Nova Scotia*. Available online. Part 1:Vegetation Types, <http://novascotia.ca/natr/forestry/veg-types/pdf/vegtypes.pdf>
5. Various field guides may be helpful, especially those targeted to Eastern Canada. Some of our favorites are by Boland, Peterson, and Newton. SEASIDE has a few copies for class use.

Course Assessment – Note: All assignments and tests are individual.

Assignment or test	Marks (%)	Due Date
Plant Species Presentation	5	July 31
Lecture Quiz on Plant Families (multiple choice)	5	August 1
Environmental Assessment (EA) Report	10	August 7
Scavenger Hunts	5	throughout field trips
Lecture Exam	20	August 10
Laboratory Exam (species identification)	15	August 10
Plant Collection	30	August 13
Field Notebook	10	August 13

Plant Collection

You will each assemble, describe and mount a collection of botanical specimens containing a *minimum* of 25 herbarium-quality specimens of different species from as many different plant families as possible. The more families that are represented in a collection, together with the best descriptions (determination/location labels) and care and attention to specimen preparation and mounting, the higher the potential grade. Considering that there are more than 1600 sp. to choose from, a collection of 25 species should be a “walk in the park”.

Your collection should contain 2-3 Pteridophytes (ferns and their allies), 2-3 Pinophytes (conifers), and the rest of your collection should be approximately representative of the province’s Magnoliophytes (*i.e.* 25% monocots and 75% dicots). No more than 5 woody species are allowed. Inclusion of species at risk will result in severe grade reduction - if in doubt about a species’ status, ASK! Further instructions and information will be presented on the first class day, and refined throughout the duration of the course.

Field Trip Scavenger Hunts

Prior to each field trip, you will be assigned a rare, unusual, or unique plant that grows in the field trip location. No identifying information will be given except the botanical name. Students must locate the plant species in the field and show the instructor (but NOT collect the species).

Plant Species Presentation

Each student will choose one plant species native to Nova Scotia and produce a 7 minute presentation. The presentation should consult the scientific literature, highlight Latin and common names, morphology, habitat, associations, conservation status, similar species and some fun facts.

Field Notebook

When in the field, is essential to document everything you see that may be relevant to your collected specimens. During each of our field trips, you will note the plants you observe, highlighting many characters associated with your collected specimens, as well as habitat characteristics, and the plant communities of each site. You will also sketch the plants, indicating their notable features. The notebook is due at the end of the course.

Environmental Assessment Report

During the day-long field trip to Kentville Ravine students will be guided through an environmental assessment exercise in two different areas. Vegetation communities will be sampled and the abundance of each species will be quantified, along with environmental factors. Students will prepare a report summarising the habitats and comparing the observed plant communities.

Laboratory exam

Timed ‘bell-ringer’ lab exam will test your ability to identify 50 species of plants seen on field trips.

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

- 1. Attendance is mandatory.** You are expected to attend all lectures, labs, and field trips. Attendance will be taken and unnecessary, unplanned absences will be considered toward your grade. If there will be a problem that prevents you from attending, notify the instructor *before* the absence.
- 2. Participation.** You are expected to participate and cooperate in all class activities. Bonus marks may be awarded to students who regularly contribute meaningful questions/dialogue in class.
- 3. Preparation for Field Trips.** Please be fully prepared and ready for all field trips. You are responsible for your own lunches/water, appropriate clothing, and required equipment as per the included lists. Transportation is provided for all field trips except the Halifax walking trip. Field trips will continue independent of weather. See list of what to bring on field trips.
- 4. Safety.** You must adhere to all safety guidelines. When out of sight of instructors, you must stay in groups of 2 or more and inform instructors of where you will be going and when you will be back. For your safety, alcoholic beverages and recreational drugs are not permitted on field trips.
- 5. Brightspace.** We will use the online learning system to post class information and links. Lecture slides will be posted there as well as information about assignments.
- 6. Late assignments.** Marks will be deducted 10% for each day an assignment is late.

What to bring on field trips

- Small day/backpack
- Lunch/snacks/water (enough to last a full day in the field, potentially under hot sun)
- Rain gear, long pants, long-sleeved shirt
- Sun hat, sunglasses, and sunscreen
- Insect repellent and/or bug hat
- Hiking boots or sturdy walking shoes
- A field notebook (provided) plus pencils
- Hand lens
- A clipboard or fold-flat binder will be useful
- Plant collecting equipment including bags for collecting plants, trowel, and pruner
- Camera/binoculars/cell phone/tablet and any other equipment useful for a day in the field

Course Schedule (tentative)

Day	Date	Morning	Afternoon
1	July 23 Mon	1. Course Introduction 2. Botany – the language, floras, manuals, field guides, nomenclature 3. Botanical systematics – APG versus Cronquist 4. morphology – keys to identification 4. habitats - 5. Orientation to tomorrow's field trip	Lab #1: Tools: keys, glossary, dissecting scope; describing plant collections; illustrating/sketching plants and floral diagrams. Preparing specimens for preservation. Working from fresh and dried plants, practice in observing and identifying calyx, corolla, leaves, stems and roots and how the language of botany describes conditions.
2	July 24 Tues	Systematics 1: The ferns and their allies; the conifers: characteristics of each Phylum, orders and families. Morphology, identification: fronds, stipes, rhizomes, spores; seeds, cones, strobili. Introduction to field records, collection, plant collection assignment and field notebook in preparation for afternoon trip.	FIELD TRIP – Halifax. Meet at Sir Sanford Fleming Park (the Dingle). Halifax Metro bus number 15 will take you there. Mixed forest, small pond, wetland; rocky habitat. Trails.
3	July 25 Wed	Systematics 2: The flowering plants: Review of angiosperm clades: basal and core eudicots, monocots and magnoliids, plus Nymphaeales. Discussion of where NS Flora fit into the worldwide flora. Cronquist groups of dicots: tree families, wetland plant families up to roses.	Lab #2: Work on collections; floral morphology; floral diagrams and illustrating plants; examine examples of families collected. Characters of the families to be seen tomorrow: intro ericads, rosiids, and other shrubs.
4	July 26 Thurs	FULL DAY FIELD TRIP to PEGGYS COVE departing from the Biology LSC parking area at 9:05 AM, returning approximately 5 PM.	
5	July 27 Friday	Systematics 3: the flowering plants, from beans to asters <i>sensu</i> Cronquist.	Lab #3: Floral structures. Introduction to sampling techniques and plants of significance for Monday's field trip.
6	July 30 Mon	FULL DAY FIELD TRIP to KENTVILLE RAVINE intro to ecological sampling for environmental assessments; old-growth coniferous woods and meadow.	
7	July 31 Tues	Systematics 4: the monocot families and their placement in both Cronquist and APG systematics; sedges, grasses, orchids, pondweeds and rushes plus other families	Lab #4: Class presentations (plant species profiles). Collected monocots; flowers. Grass and sedge flowers. Work on field book and collections.

Day	Date	Morning	Afternoon
8	Aug 1 Wed	Lecture quiz on the 136 families of plants. Guest lecture (TBA)	Lab #5: leaves and stem arrangements, roots and rhizomes. Beach plant communities and invasion in prep for tomorrow's field trip; work on plant collections, field book and practice bell ringers (timed ID quiz).
9	Aug 2 Thurs	FULL DAY FIELD TRIP to MARTINIQUE BEACH and SALTMARSH departing from the Biology LSC parking area at 9:05 AM, returning approximately 5 PM.	
10	Aug 3 Friday	Useful and poisonous plants: wildcrafting, 5Ps, types of phytotoxins and examples of each found in wild	Lab #6: What to do? I have been poisoned. Work on collections and final work on environmental assessment project.
11	Aug 7 Tues	Review of morphology, glossary, floral diagrams. Review of plant communities seen. Discussion of gypsum-loving plants and riparian plants in prep for field trip to Hants Co.	Lab# 7: Final work on collections, drawings and field book. Submit EA report(online 11:59 PM)
12	Aug 8 Wed	Weeds: Introductions and invasive species: mode of introduction with examples; invasion; impact of invasive species	FIELD TRIP: Walking discussion on weeds to Halifax Seaport; Public Gardens, walking down to Pier 21-22. Final chance to collect.
13	Aug 9 Thurs	FULL DAY FIELD TRIP to HANTS CO: Smileys Provincial Park (no collecting) and Brooklyn Road mine site. Caution: poison-ivy. Depart from the Biology LSC parking area at 9:05 AM, and return approximately 5 PM.	
14	Aug 10 Friday	One hour review and questions (9-10 AM). Lecture exam (10:30-11:59 AM).	Study time (1-3 PM). Lab exam: timed, plant identification (3:00-4:30 PM).
	Aug 13 Mon	(no class) Last day to submit field book and collections.	

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

Missed or Late Academic Requirements due to Student Absence (policy)

https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.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/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>