Faculty of Science Course Syllabus (DRAFT)
Department of Biology
BIOL 2601/BIOL 3219
Flora of Nova Scotia
Summer – July 7-23, 2025

Instructors:

Dr. Sean Haughian (NS Museum of Natural History, Halifax, NS) -
Dr. Nick Hill (Kespukwitk Biosphere Reserve, Yarmouth, NS)

Demonstrators / TAs: TBD

Classroom: TBD

Time: 9:00-12:00 and 13:00-17:00 (see detailed schedule)

Field trips:

(see detailed schedule; note that activities may need to be rescheduled due to inclement weather and availability of guest lecturers or trip leaders)

Course Description

This course provides an introduction and practical field experience in the diversity, identification, biogeography, and ecology of plants. Students learn through lectures, presentations, field work, and collecting. On 6 days of field trips to locations around the province, students learn from botanists how to identify plants, conduct field surveys, document data, and collect or prepare museum-quality specimens.

Course Prerequisites

For Biol 2601, at least one year of University-level courses are recommended.

For Biol 3219, the prerequisites of BIOL 2060.03 (Introductory Ecology) and 2004 (or another introduction to biological diversity), or instructor's approval are required. Students should have at least two years of university courses (60 credit hours or more).

Further information

This course is skills-based and provides practical experience working with Nova Scotian plants, including vascular and nonvascular plants and lichens. This course will build on knowledge students have obtained through previous introductory ecology and biodiversity courses. Students will learn about plant and lichen morphology, plant and lichen species at risk (SAR), and the major plant communities of Nova Scotia. Skills include identification, sampling methods, data and specimen collection and management, and using plant species composition to determine forest ecosystem classification.

Lectures will provide background content. The course will focus on terrestrial plants and lichens but will include some freshwater and coastal plants during field trips.

Includes six days of field trips during which students will accompany instructors to learn about native plant communities *in-situ*. The schedule will vary and may change due to weather conditions. Students may need to walk over uneven terrain, on and off trail, through woods and bogs. An auxiliary fee is charged to cover costs of field expenses (mainly transportation). This fee is charged on top of the tuition for a half-credit Biology course.

The course provides an opportunity to obtain field and research experience with Nova Scotian plants and lichens. It is excellent preparation for honours students or other students who plan to conduct vegetation surveys as part of their field research in their 4th year, or for students who are interested in employment with conservation or environmental consulting organizations.

Field Trips

Students are expected to arrive on time and prepared for field trips. They will need to be ready for all weather conditions (hot, cold, or wet weather). The checklist on the last page of the syllabus will assist in this preparation, but is not exclusive, and students should ensure they have all necessary personal or medical equipment with them in the field.

Field activities will include hikes on uneven dirt trails ranging from 2-14 km per day, as well as short walks of up to 500 m off-trail, sometimes in challenging terrain, while carrying all necessary personal supplies, such as water, food, and safety equipment.

Course Objectives/Learning Outcomes

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

- Use appropriate terminology to discuss Nova Scotian Plants and issues around them
- Find and use information on plants in Nova Scotia and Canada
- Identify selected Plant Species at Risk in Nova Scotia
- Apply botanical terminology and concepts to describe plant species from outside of Nova Scotia (e.g., cultivated, non-native plants)
- Use plant species composition to determine forest ecosystem classifications
- Collect, organize, and present field data
- Use data from online sources to conduct an environmental screening or assessment
- Use standard field sampling techniques, including:
    - Survey techniques for different Species at Risk
    - Navigation with compass and GPS
    - Documentation of field locations, conditions, activities, and observations in a field notebook
    - Collect and preserve plant specimens for herbarium preservation

Course Materials

All course materials and announcements will be provided through the BrightSpace course website. Assignments will include explicit instructions and a marking rubric. Assigned and recommended readings will be posted on Brightspace.

Students will need to use Microsoft Word, Excel, and Powerpoint for classwork. Microsoft Office can be downloaded for free for use on personal computers by Dalhousie Students. If you do not have a personal computer on which you can install these programs, you will need to do your work in the Dalhousie computer labs. It will be useful to have your own smartphone or GPS on the field trip, but students who don't have access to these tools may be able to borrow one from the Seaside equipment stores or the Dalhousie library.

The most important book for this course is "Roland's Flora of Nova Scotia", which can be purchased at the bookstore. Students will be permitted to use their personal copy on all tests and quizzes.

1. Zinck, Marian. 1998. Roland's Flora of Nova Scotia. Nimbus Publishing, Halfiax, NS, Canada. 1300 pp.

A copy of the updated "Nova Scotia Plants", by Marian Munro, would also be suitable, but would need to be printed by the students themselves (see reference 5 below for link to pdf file).

Students are strongly encouraged to seek additional resources through the Nova Scotia Wild Flora Society website, and to download and use the following free resources:

2. Brodo, I.M., R. Cameron, H. Andrachuk, and B. Craig. 2005. Identifying lichens of Nova Scotia: a reference guidebook. Environment Canada, Ottawa, ON, Canada. https://www.novascotia.ca/nse/protectedareas/docs/identifying.nova.scotia.lichens.pdf
3. Crowley, M., and L. Beals. 2011. Atlantic Coastal Plain Flora in Nova Scotia: identification and information guide. Mersey Tobeatic Research Institute, Kempt, NS, Canada. http://www.speciesatrisk.ca/coastalplainflora/guide/
4. Ireland, R.R., and G. Bellolio. 1987. Illustrated guide to some hornworts, liverworts, and mosses of eastern Canada. Canadian Museum of Nature, Ottawa, ON, Canada. https://www.biodiversitylibrary.org/bibliography/128441
5. Munro, M., R. Newell, and N.M. Hill. 2014. Nova Scotia Plants. Province of Nova Scotia, Halifax, NS, Canada. https://ojs.library.dal.ca/NSM/pages/view/Plants
6. Neily, P., S. Basquill, E. Quigley, B. Stewart, and K. Keys. 2010. Forest Ecosystem Classification for Nova Scotia – Part 1: Forest Vegetation Types. Nova Scotia Department of Natural Resources, Renewable Resources Branch, Truro, NS, Canada. https://novascotia.ca/natr/forestry/veg-types/printable.asp
7. Nova Scotia Department of Natural Resources. 2007. Tree identification guide for common native trees of Nova Scotia. Nova Scotia Department of Natural Resources, Truro, NS, Canada. https://novascotia.ca/natr/forestry/TreeID/TreeID2007.pdf
8. Hinds, H. The Flora of New Brunswick. University of New Brunswick press, Fredericton, NB, Canada. https://unbherbarium.lib.unb.ca/page/order-flora-new-brunswick ($25)

In addition, students are encouraged to purchase or borrow and use regionally-appropriate field guides to plants and lichens. Field guides are much easier to carry on long hikes, less likely to suffer water damage, and tend to focus on the most common things, rather than covering everything. Some recommended guides include (approximate prices in parentheses):

9. Arsenault, M., G.H. Mittelhauser, D. Cameron, A.C. Dibble, S.C. Rooney, J.E. Weber, and A. Haines. 2013. Sedges of Maine: A Field Guide to Cyperaceae. University of Maine Press, Orono, ME, USA. ($60)
10. Boland, T. 2013. Trees and Shrubs of the Maritimes: Field Guide. Boulder Books, Portugal Cove-St. Philip's, NL, Canada. ($35)
11. McMullin, R.T., and F. Anderson. 2014. Common Lichens of Northeastern North America. New York Botanical Garden Press, New York, NY, USA. ($45)
12. Saunders, G. 1996. Trees of Nova Scotia. Halifax, NS: Nimbus Publishing. 102 pp. https://nimbus.ca/store/trees-of-nova-scotia.html ($20)

Students will also likely find the following smartphone or web applications useful during field trips and course-work:

1. iNaturalist (iNaturalist.org)

2. a GPS or mapping application that works without a data plan, such as Locus Maps, Avensa, Alpine Quest, GPS Essentials, or Canada Topo Maps

Course Assessment

Students will be assessed primarily by their work and the assignments they produce. There will be eight lab quizzes (one for each morning) that will be used to evaluate student's knowledge and skills with plant morphology & identification and the use of taxonomic keys. Students will also give a short presentation early in the course, and submit a field notebook documenting observed and collected plants during field trips.

Although students will collect data together, and may share in entering, compiling, and analysing their data, students will be individually assessed on their ability to contribute to field activities and to collect and manage data.

Throughout the course each student will build a plant collection comprised of (1) a plant press with eight field-collected, dried, and identified specimens, and (2) two museum-quality specimens mounted on 11 × 17 archival sheets for the provincial herbarium.

Marks in the course will be based on the following (see Brightspace for instructions and rubrics):

Assessment	**% of final mark**
Grocery store / kitchen botany presentation	5
Field notebook	15
Plant collection (10 specimens)	40
Laboratory quizzes (8 quizzes, beginning on day 2)	40

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

As this course is very field-intensive, and because data collection and entry will be shared among classmates, full attendance and participation, as essential components of this course, are required. Full participation includes, but is not limited to, participating in all scheduled course activities in the classroom and field, cleaning up workstations after the lab, and being prepared for all field trips, with appropriate personal gear. Late assignments and missed coursework will be addressed case by case at the discretion of the instructors. Plagiarism detection software will be used on papers submitted to Brightspace.

NOTE: Alcohol and recreational drugs (legal or illegal), are NOT permitted on field trips.

Class Schedule

Please note that due to the nature of this course the schedule may change to accommodate inclement weather and the availability of guest lecturers or field co-leaders. Surveys will be conducted at various

times of day, from early morning until late afternoon, as appropriate for each species. Weather may not allow field work each day, or for just part of the day, so the schedule must be flexible.

Detailed tentative schedule

Date	Day of week	Location & instructor	Activities	Details & assignment due dates
July 7	**Monday**	**Dalhousie Campus (LSC ??)** **Nick & Sean**	**Lectures & lab**	Lectures: • Introduction & housekeeping • Using iNaturalist and plant ID apps. • Floral formulas • Roots, stems, and leaves • Mosses and lichens intro Lab: • Flower dissections • Herbarium collection & preservation methods • Campus walkabout: Tree species of Nova Scotia
July 8	**Tuesday**	**Dalhousie Campus (LSC ??)** **Sean**	**lectures & lab**	Quiz: plant morphology & anatomy Lectures: • Hardwood forests • Staying safe around poison plants (Anacardiaceae, Urticaceae) • Grocery store plant presentations • Monocots vs. Dicots Lab (spring ephemerals): • Corolliferae 1: Liliaceae, Orchidaceae • Ranunculales: Papaveraceae, Ranunculaceae • Violaceae
July 9	**Wednesday**	**Cape Split** **Nick & Sean**	**Field trip (full day)**	Meet at Dal campus at 7:00. Mature hardwood forest & spring ephemerals (Cape Split) for most of day. Return to campus expected by 18:00.
July 10	**Thursday**	**Dalhousie campus (morning), Shaw Wilderness Park (afternoon)** **Nick & (guest)**	**Lectures & Field trip (afternoon)**	Quiz: Spring ephemerals & hardwood forests Lectures: • Ecosystem classification in Nova Scotia • Guest lecture? the Ericaceae • Lecture: Rosales (Cornaceae, Rosaceae) & Grossulariaceae • Sand barrens vegetation

Date	Day of week	Location & instructor	Activities	Details & assignment due dates
July 11	**Friday**	**Dalhousie Campus (LSC ??)** **Nick**	**lectures & lab**	Quiz: Ericaceae & Rosaceae, barrens Lectures: • Coastal barrens of Nova Scotia • Catkin-bearing shrubs (Salicaceae, Myricaceae) Lab: • Ground-dwelling bryophytes and lichens • Caryophyllalales: Caryophyllaceae, Polygonaceae, Amaranthaceae • Brassicaceae, Oxalidaceae
July 12	**Saturday**			no planned activities
July 13	**Sunday**			no planned activities
July 14	**Monday**	**Dalhousie Campus (LSC ??)** **Sean**	**lectures & lab**	Quiz: Coastal barrens, Brassicaceae, Caryophyllales Lectures: • Environmental impact assessment surveys & preparing botanical survey reports Lab: • Onagraceae • Dipsacales: Viburnaceae, Caprifoliaceae • Apiales: Araliaceae, Apiaceae • Fabaceae
July 15	**Tuesday**	**Bill Freedman trail** **Nick & Sean?**	**Field trip (full day)**	Meet at Dal campus at 8:00. Bring field notebooks, pencils, and appropriate personal gear and clothing. A reminder that coastal sites are often cooler than the mainland! Return should be by about 17:00.
July 16	**Wednesday**	**Dalhousie Campus (LSC ??)** **Sean**	**Lectures & lab**	Quiz: Apiales & Dipsacales Lectures: • Sand dunes • Salt marshes • Graminoid flowers & morphology **Lab:** • Glumiflorae: Grasses, sedges, and rushes • Typhaceae

Date	Day of week	Location & instructor	Activities	Details & assignment due dates
July 17	**Thursday**	**Lawrencetown Beach, Salt Marsh trail** **Nick & Sean & guest?**	**Lectures & field trip**	Field trip (morning): dunes and salt marshes Bring swim-suits? Hit some coniferous forest sites on the way?
July 18	**Friday**	**Dalhousie Campus (LSC ??)** **Nick**	**lectures & lab**	Quiz: salt marsh flora Lectures: • The Atlantic Coastal Plain Flora • Forested wetlands • Carnivorous plants Lab: • Epiphytic lichens • Ferns & allies (Dryopteridaceae, Lycopodiaceae, Equisetaceae) • Aquatic plants (Corolliferae 2): Alismatales, Nymphales, Iridaceae, Potamogetonaceae
July 19	**Saturday**			no planned activities
July 20	**Sunday**			no planned activities
July 21	**Monday**	**Dalhousie Campus (LSC ??)** **Sean – morning** **Nick - afternoon**	**lectures & lab**	Quiz: wetlands & coastal plain flora Lectures: • Plant phenology • Plant & lichen species at risk Lab: • Asteraceae • Dicots with bilateral flowers in spikes: Lamiaceae, Orobranchaceae, Plantaginaceae
July 22	**Tuesday**	**Southwest Nova:** **Sean & Nick**	**Field trip**	Meet at Dal campus at 7:00 am. Atlantic Coastal Plain Flora, forested wetlands. Return expected by 18:00. • Eel Weir, Wildcat Reserve, Ponhook restoration site
July 23	**Wednesday**	**Dalhousie Campus (LSC ??)** **Nick – morning** **Sean – afternoon**	**lectures & lab**	Morning: last quiz, then lab work time for collections Field notebooks due @ 12:30 Plant collections due @ 16:30

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-academicrequirements-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/studenthealth-and-wellness.html
Student Advocacy: https://dsu.ca/dsas
Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-gethelp/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

Recommended field equipment checklist

- Daypack-style backpack (i.e., approximately 25-40 L in size).
- Raincoat and rain pants
- Sunhat
- Supportive footwear (hiking boots, rubber boots, or sneakers that won't cause blisters when wet)
- Sandals, paddling shoes, or old sneakers for walking in shallow water
- Pocket knife (locking or fixed blade recommended for safety)
- Gardener's trowel
- Water bottles or hydration bladder (enough to carry at least 2.5 L of water)
- Insect repellant spray (with DEET or Icaridin)
- Head net or bug jacket
- Sunscreen
- Digital camera, smartphone, or tablet
- Tweezers or other tick-removal device
- Personal First-aid kit for minor cuts and scrapes
- Personal medications (including Epipen, if needed)
- Hand lens (10-16 × magnification, triplet or doublet style, and at least 21 mm diameter recommended)*
- Waterproof notebook*
- Pencils
- Sharpie-style felt marker