

Faculty of Science Course Syllabus Department of Biology

Agroforestry (BIOL 3634)

Summer 2024

Instructor:

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Lectures:

Mon-Sat: 09:35 – 15:25 hrs (*in-person*)

Field studies and Lab analysis:

April 27th, May 02nd &, May 03rd, 2024

(*Point Pleasant Park/ Halifax, Lone-Tree & River Berry farms/ Lunenburg*)

****Delivery of lectures & labs: in person only***

Course Description

Agroforestry is a land-use system in which trees or shrubs are grown in association with agricultural crops and/or livestock. As practiced in the tropics, agroforestry generates numerous ecological, environmental, and economic benefits.

This hands-on, field-intensive course provides a foundation for understanding this traditional practice and its applications in North America.

Course Prerequisites

Introduction to Ecology (BIOL 2060.03) from Dalhousie's Biology Dept or BIOL 3001 or AGRI 1000 from Dalhousie's Faculty of Agriculture or an equivalent class or permission of instructor. An additional class on the biology, ecology, plant diversity or physiology of plants is recommended.

Course Textbook

'Agroforestry' custom made (from various resources in North America and around the world). Students get these materials on course website (Brightspace) at no cost.

Learning Objectives

- To understand the need of agroforestry and the biophysical processes involved
- To study the role of agroforestry systems in soil fertility and nutrient cycling
- To examine tree-crops-soil interactions (for light, water and nutrients)
- To relate agroforestry in conservation strategies
- To get field experience in agroforestry and evaluate a few multipurpose tree species.

Course Assessment

Assignment, Exam, or Presentation	Marks %	Date
Oral Presentation	10	May 09
Brief Report (<i>Tree-plant interaction</i>)	15	May 11
Special Report (<i>An AF system/MPTS</i>)	10	May 09
Field/Lab Report (<i>LaHave Forest</i>)	20	May 11
Quiz	15	May 07
Written Exam	30	May 10
Total	100	

Field study 1: Field observation and data collection at Point Pleasant Park on “Tree-Plant Interactions”

- Abiotic factors (light intensity, Soil temperature, soil moisture content, pH, Soil nutrients)
- Biotic factors (shoot/root growth patterns, diversity)

(A five-page report, based on the given questions, should be submitted on the last day of class)

**Soil and data analysis will be done during the lab sessions.*

Field study 2: “Lone-Tree, and Lahave river berry farms” near Lunenburg.

- Modern Agroforestry practices towards sustainability (Forest farming, Windbreak, Api-silviculture)
- Different Multipurpose Tree Species and their contribution to soil fertility
- Haskap berries in agroforestry systems

After obtaining and analyzing the data, a five-page field report should be submitted for evaluation.

Format: Abstract, Introduction, Research objective, Method/materials, Results, Conclusions and Discussions

**Soil and data analysis will be done during the lab sessions.*

(A waterproof notebook will be provided for use in the field and at the field station, allowing for the recording of procedures, hypotheses, and findings. This resource will facilitate the taking of quick field notes and data).

Monograph on a Multipurpose Tree Species

A two-page monograph (description, distribution, uses and special purpose in agroforestry) on a Multipurpose Tree Species (MPTS) should be submitted at the end of the oral presentations.

Computer use and communications

Computer use will be necessary for this field-oriented class including oral presentations and field reports. We will also rely on email/messages for communication among students and between students and teaching staff (instructor and teaching assistant) via Brightspace. Field reports and presentations will

require the use of Excel (spreadsheets/graphs), Word, Power-point and a statistical software. Reports are submitted electronically via the drop box on Brightspace.

Oral Presentation

Students are expected to do a 10-minute power point presentation (followed by a 2 -3 minute question period) on a selected Multipurpose Tree Species relating their uses in modern agroforestry before submitting their two/three-page report. The report should include the answers to the questions raised during the presentations.

Grading Scale

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

All lectures, field studies and Lab analyses are mandatory.

All components of this course are delivered in person.

Power-Point Slides and announcement are posted on Brightspace.

Meeting deadlines is mandatory. No late submission without valid reason is accepted for marking.

Brightspace (course web-tool) is used for regular updates and announcements.

Course Content

Tentative schedule (subjected to change due to weather and admin related issues)

Day	Activity
Day 1 (April 25, 2024) Thursday	<u>Morning session</u> 1. Introduction to Agroforestry 2. Practical Applications of Agroforestry <u>Afternoon session</u> 3. Agroforestry practices: Video
Day 2 (April 26, 2024) Friday	<u>Morning session</u> 4. Agroforestry services/ Soil conservation 5. Successful Agroforestry approaches in Canada <u>Afternoon session</u> 6. Multipurpose Tree Species in Agroforestry 7. Introduction to field study at Point Pleasant Park 8. Tree identification

Day 3 (April 27, 2024) Saturday	<u>Morning session</u> 9. Field Study I: Point Pleasant Park Tree-Plant Interaction/Data collection <u>Afternoon session</u> 10. Soil analysis & Data analysis I (at Lab)
Day 4 (April 29, 2024) Monday	<u>Morning session</u> 11. Agroforestry Discussion 12. Temperate Agroforestry: Video <u>Afternoon session</u> 13. Soil analysis & Data analysis II (at Lab)
Day 5 (April 30, 2024) Tuesday	<u>Morning session</u> 14. Agroforestry and the future <i>Brief Introduction on Field report and oral presentations</i> 15. Info on PPT Presentations and Multi Purpose Tree Species (MPTS) selection <u>Afternoon session</u> 16. Introduction to field work at Lahave forests/Southshore farms and preparations
Day 6 (May 01, 2024) Wednesday	<u>Morning session</u> 17. Pre-Field Study Discussion Agroforestry in Haskap-berry farms/Info on data collection <u>Afternoon session</u> 18. Guest Lecture: Agroforestry in Nova Scotia
Day 7 (May 02, 2024) Thursday (Lahave Forests/Haskap Berry Farms)	19. Field Study II Visit to Haskap-berry and Agroforestry Fields/Data collection <i>(Whole day)</i>
Day 8 (May 03, 2024) Friday (Lahave Forests/Haskap Berry Farms)	20. Field Study III Visit to Agroforestry Fields 21. Students' discussion session <i>(with TAs)</i>
Day 9 (May 04, 2024) Saturday	<u>Morning session</u> 22. Lab analysis <u>Afternoon session</u> 23. Statistical analysis 24. Final discussion on soil and statistical analyses
Day 10 (May 06, 2021) Monday	25. Field report and PPT preparation/ Class discussion <i>(morning session only)</i>
Day 11 (May 07, 2021) Tuesday	<u>Morning session</u> 26. *Quiz (9:35 - 10:55 am) <u>Afternoon session</u> 27. PPT preparation (12:05 pm to 2:25 pm)

Day 12 (May 08, 2024) Wednesday	Self study day/ Presentation & written report preparation day (<i>no lectures</i>)
Day 13 (May 09, 2024) Thursday	28. Students' Oral Presentations (<i>morning session only</i>) Due: Special report on Multi-Purpose Tree Species
Day 14 (May 10, 2024) Friday	<u>Morning session</u> 29. Written Exam: 2 hours (9:35 - 11:25 am) <u>Afternoon session</u> 30. Working on brief and field reports 'Final Drafts'
Day 15 (May 11, 2024) Wednesday	Deadline to submit; (11:30 pm/via BS) a. Brief report on "Tree-plant interaction" (Point pleasant park) b. Field report (Lone-Tree, and Riverberry Forest Farms)

Morning and after-noon sessions are conducted during 0935-1155 and 1305-1525 hrs respectively.

University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

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.

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/undergrad-students/degree-planning.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.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>

Dalhousie COVID-19 information and updates: <https://www.dal.ca/covid-19-information-and-updates.html>

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