

**Faculty of Science Course Syllabus
Department of Biology**

Agroforestry (BIOL 3634)
Summer 2020

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Lectures: Mon-Sat: 09:35 – 16:55 hrs (LSC/C244)

Labs: April 30th, May 5rd and 7th, 2018
(LSC/ Lab 2097)

Field study: April 29th, May 01, May 02nd & May 04th, 2020
(Point Pleasant Park, Forest farms in Lunenburg, Maple farms in Colchester county & costal barrens in Peggys cove respectively)

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, 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 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 08
Brief Report (<i>Tree-plant interaction</i>)	10	May 12
Special Report (<i>An AF system/MPTS</i>)	10	May 12
Field Report (<i>LaHave Forest</i>)	25	May 12
Quiz	10	May 07
Written Exam	35	May 11
Total	100	

Field visit 1: Half a day field observation and data collection at Point Pleasant Park on “Tree-Plant Interactions”

a. Abiotic factors (light intensity, Soil temperature, soil moisture content, pH, Soil nutrients)

b. Biotic factors (shoot/root growth patterns, diversity)

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

**Soil and data analysis will be done at the university lab*

Field visit 2: One day field research at “Lahave forests/ Southshore farm” near Lunenburg.

a. Modern Agroforestry practices towards sustainability (Forest farming, Wind-break, Api-silviculture)

b. Different Multipurpose Tree Species and their contribution to soil fertility

c. Haskap berries in agroforestry systems

After collecting and analyzing the data, a seven page field report should be submitted for evaluation.

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

(Weather-friendly notebooks will be given to students for use in the fields and field stations to include notes on procedures, hypotheses, and findings. This will be an invaluable resource in writing field reports)

**Soil and data analysis will be done at the university lab*

Field visit 3: A day trip to “Maple -tapping Farms” in Colchester county to experience some hands-on activities in Multi-Purpose Tree research followed by a lecture by an expert on forest farm practices.

(No written report is expected, the practical knowledge is necessary for the quiz)

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 course.

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 BBL. Field reports and presentations will require the use of Excel (spreadsheets/graphs), Word, Power-point and a statistical software.

Oral Presentation

Students are expected to do a 10 minute power point presentation on a selected Multipurpose Tree Species relating their uses in modern agroforestry before submitting their 1-2 page report.

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 visits and Lab analysis are mandatory.

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

No alcoholic beverages or recreational drugs are permitted on field trips.

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

Course Content

Tentative schedule

Day	Activity
Day 1 (April 27, 2020) Monday	<u>Morning session</u> 1. Introduction to Agroforestry 2. Practical Applications of Agroforestry <u>Afternoon session</u> 3. Soil conservation and Agroforestry
Day 2 (April 28, 2020) Tuesday	<u>Morning session</u> 4. Agroforestry services 5. Successful Agroforestry approaches in Canada <u>Afternoon session;</u> 6. Multipurpose Tree Species in Agroforestry Introduction to field study at Point Pleasant Park Tree identification
Day 3 (April 29, 2020) Wednesday	<u>Morning session</u> Field Trip to Point Pleasant Park Tree-Plant Interaction/Data collection <u>Afternoon session</u> Soil analysis I at Dalhousie laboratory (using test kit) *Point pleasant park soil samples will be analysed using test kit *Statistical analysis
Day 4 (April 30, 2020) Thursday	<u>Morning session</u> 7. Agroforestry and the future <i>Brief Introduction on Field report and presentation</i> <u>Afternoon session</u> <i>Introduction to field work at Lahave forests/Southshore farms and preparations</i>

Day 5 (May 01, 2020) Friday (Lahave Forests/Southshore Farms)	At 9:30 am: Departure from Dalhousie 11:00 am: Field-work/research 12:30 pm- 1:00 pm Lunch/Snack (packed lunch) 1:00 pm- 4:00 pm Fieldwork/research 6:00 pm: Departure to Dalhousie from the forest farms
Day 6 (May 02, 2020) Saturday (Colchester County Farms)	At 9:30 am: Departure from Dalhousie 10:30 am- 12:00 noon Seminar 12:00 pm- 12:30 pm Lunch (provided at the field station) 12:30 pm- 3:00pm Field work At 3:30 pm: Departure from Colchester county farms
Day 7 (May 04, 2020) Monday (Costal barrens, Peggys Cove)	At 9:30 am: Departure from Dalhousie 10:30 am- 12:00 noon (Field Observations) 12:00 pm- 12:30 pm Lunch/Snack 12:30 pm- 2:00pm Field work At 2:30 pm: Departure from Peggys Cove
Day 8 (May 05, 2020) Tuesday	Morning session : PPT/Oral presentation introduction, Field Report Introduction <u>Afternoon session</u> Soil analysis II at Dalhousie laboratory (using test kit) *LaHave forests/ Southshore farms' soil samples will be analysed using test-kit *Statistical analysis
Day 9 (May 06, 2020) Wednesday	Field reports and Statistical Analysis (9:35 am- 11:35 pm) PPT preparation (12:05 pm to 2:35 pm)
Day 10 (May 07, 2020) Thursday	*Quiz (9:35 am- 11:35 pm) PPT preparation (12:05 pm to 2:35 pm)
Day 11 (May 08, 2020) Friday	Students' Oral Presentations (9:35 am- 15:35 pm)
Day12 (May 09, 2020) Saturday	Study leave for exam and off days for written report preparation (for students to prepare all three reports/ on 10 th , they will be allowed to come to the classroom and discuss with their peers to complete the reports/teaching staff will be there for help)
Day 13 (May 11, 2020) Monday	Morning: Written Exam: 2 hours (1:05 pm- 3:05 pm) Afternoon: Field report preparation
Day 14 (May 12, 2020) Tuesday	Deadline to submit; (9:35 am to 11:35 am) a. Brief report on "Tree-plant interaction" (Point pleasant park) b. Field report (LaHave forest) c. Special report on Multi-Purpose Tree Species

Moring and after-noon sessions are conducted during 0935-1225 and 1305-1655 hrs respectively



Items needed for field and research experiments

1. pH meter
2. Photo meter (to measure the light intensity)
3. Soil tools (augur or shovel) and nutrient testing kits
4. Tape measure
5. Hand-lenses
6. Paper/Polythene bags (small and medium sizes)
7. Marker pens
8. Tags or labels
9. Field notebook
10. Ropes
11. Outdoor thermometer
12. N, P, K test kit
13. Binoculars
14. Field guide (any flora of NS identification book)
15. Digital camera/Smart-phone camera

Items 1 - 12 Provided at the field station

Items 13- 15 Students can bring their own Items; Four different guides with colour pictures will be uploaded on the course website

During field research: Items needed/recommended for students

1. Clipboard & notebook paper
2. Pens & pencils
3. Daypack or shoulder bag to carry your things
4. Sneakers/ hiking boots
5. Windproof jacket/rain jacket and pants
6. Sunscreen
7. Insect repellent
8. Sunglass
9. Hat and gloves

***** If the proposed field work and lab analysis cannot be done due to the current Covid-19 shutdown, the course will be cancelled (remote offering is not possible for agroforestry field course)**

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>

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