

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

**Agroforestry (BIOL 3634)  
Summer 2018**

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

**Labs:** April 30<sup>th</sup>, May 5<sup>rd</sup> and 7<sup>th</sup>, 2018  
(LSC/ Lab 2100)

**Field study:** April 30<sup>th</sup>, May 02-03<sup>rd</sup>, May 04<sup>th</sup>, 2018  
(Point Pleasant Park, Halifax, LaHave Forests, near Lunenburg, and Glenmore farm, Middle Musquodoboit respectively)

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**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 09
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 08
Written Exam	35	May 11
<b>Total</b>	<b>100</b>	

**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:** 2-day field research at “Lahave forests” near Lunenburg (including an overnight stay) to study:

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 five page field report should be submitted for evaluation.

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

(A notebook will be necessary for use in the field and field station 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 “Glenmore Farms” in Truro 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 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.

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

### Course Content

#### *Tentative schedule*

Day	Activity
Day 1 (April 27, 2018) <b>Friday</b>	<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, 2018) <b>Saturday</b>	<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 30, 2018) <b>Monday</b>	<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 (May 01, 2018) <b>Tuesday</b>	<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 and preparations</i>

Day 5 (May 02, 2018) <b>Wednesday</b> (Lahave Forests)	At 8:30 am: Departure from Dalhousie 10:30 am: Field-work/research 12:30 pm- 1:00 pm Lunch/Snack 1:00 pm- 4:00 pm Fieldwork/research 6:00 pm- 7:00 pm Dinner
Day 6 (May 03, 2018) <b>Thursday</b> (Lahave Forests, Lunenburg)	8:00 am- 8:30 am Breakfast 8:30 am- 11:30 am Fieldwork/research 12:05 pm: Departure from Lahave Forests (can go to Lunenburg and have lunch) 4:30 pm: Back to Dalhousie, Halifax
Day 7 (May 04, 2018) <b>Friday</b> (Glenmore farm, Middle Musquodoboit)	At 9:30 am: Departure from Dalhousie 10:30 am- 12:00 noon Seminar 12:00 pm- 12:30 pm Lunch 12:30 pm- 3:00pm Field work At 3:30 pm: Departure from Glenmore farm
Day 8 (May 05, 2018) <b>Saturday</b>	Morning session : PPT/Oral presentation introduction, Field Report Introduction <u>Afternoon session</u> Soil analysis II at Dalhousie laboratory (using test kit) *LaHave forest farm soil samples will be analysed using test-kit *Statistical analysis
Day 9 (May 07, 2018) <b>Monday</b>	Field reports and Statistical Analysis (9:35 am- 11:35 pm) PPT preparation (12:05 pm to 2:35 pm)
Day 10 (May 08, 2018) <b>Tuesday</b>	*Quiz (9:35 am- 11:35 pm) PPT preparation (12:05 pm to 2:35 pm)
Day 11 (May 09, 2018) <b>Wednesday</b>	Students' Oral Presentations (9:35 am- 15:35 pm)
Day 12 (May 10, 2018) <b>Thursday</b>	Study leave for exam and off days for written report preparation (for students to prepare all three reports/ on 10 <sup>th</sup> , they will be allowed to come to the class room and discuss with their peers to complete the reports/teaching staff will be there for help)
Day 13 (May 11, 2018) <b>Friday</b>	Morning: Study leave Afternoon: Written Exam: 2 hours (1:05 pm- 3:05 pm)
Day 14 (May 12, 2018) <b>Saturday</b>	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

*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

**At the field station: Required personal items**

1. Sleeping bag/blankets
2. Water bottle
3. Alarm clock
4. Flashlight with extra batteries
5. Appropriate clothing
6. Boots/Rain-boots
7. Personal toiletries (tooth brush, tooth paste, soap, shampoo and a bath towel)
8. Prescription drugs
9. Basic snack food
10. Cash (for emergency purchases)
11. Portable audio device (optional)
12. Laptop (optional, your responsibility)

## 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](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](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](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 the office (Rm 3037, McCain Building), e-mail ([elders@dal.ca](mailto:elders@dal.ca)) or leave message (902-494-6803).

**Information:** [https://www.dal.ca/campus\\_life/communities/native.html](https://www.dal.ca/campus_life/communities/native.html)

### Important Dates in the Academic Year (including add/drop dates)

[https://www.dal.ca/academics/important\\_dates.html](https://www.dal.ca/academics/important_dates.html)

### University Grading Practices

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html)

## Student Resources and Support

### Advising

**General Advising** [https://www.dal.ca/campus\\_life/academic-support/advising.html](https://www.dal.ca/campus_life/academic-support/advising.html)

**Science Program Advisors:** <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

**Aboriginal Student Centre:** [https://www.dal.ca/campus\\_life/communities/native.html](https://www.dal.ca/campus_life/communities/native.html)

**Black Advising Centre:** [https://www.dal.ca/campus\\_life/communities/black-student-advising.html](https://www.dal.ca/campus_life/communities/black-student-advising.html)

**International Centre:** [https://www.dal.ca/campus\\_life/international-centre/current-students.html](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](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](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 Services:** [https://www.dal.ca/campus\\_life/health-and-wellness/health-services/services.html](https://www.dal.ca/campus_life/health-and-wellness/health-services/services.html)

**Counselling:** [https://www.dal.ca/campus\\_life/health-and-wellness/counselling.html](https://www.dal.ca/campus_life/health-and-wellness/counselling.html)

**Student Advocacy:** <https://www.dsu.ca/services/community-student-services/student-advocacy-service>

**Ombudsperson:** [https://www.dal.ca/campus\\_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html](https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html)

## **Safety**

**Research Lab Safety:**

[https://www.dal.ca/content/dam/dalhousie/pdf/dept/safety/lab\\_policy\\_manual\\_2007.pdf](https://www.dal.ca/content/dam/dalhousie/pdf/dept/safety/lab_policy_manual_2007.pdf)

**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>

## **Questions?**

Visit forums on Brightspace and/or send emails via Brightspace.

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