DALHOUSIE UNIVERSITY

Faculty of Science Course Syllabus Department of Biology

Agroforestry (BIOL 3634)/ **Online version**
Summer 2021

Instructor:
Rajesh Rajaselvam, Email: Rajesh.Rajaselvam@Dal.Ca, Office: LSC 3082
Lectures:
Mon-Sat: 09:35 – 14:25 hrs *(Synchronous via Collaborate Ultra on Brightspace)*
Virtual labs/Field studies:
April 28th, May 01 &, May 02nd, 2021
(Point Pleasant Park/ Halifax, Lahave Forest & Lahave River Berry farms/ Lunenburg)

Delivery of lectures & labs: Synchronous via Collaborate Ultra on Brightspace

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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 (offered as an online course for this spring due to COVID restrictions) 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 (virtual experience for spring, 2021) in agroforestry and evaluate a few multipurpose tree species.

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Course Assessment

Assignment, Exam, or Presentation	Marks %	Date
Oral Presentation	10	May 10
Brief Report *(Tree-plant interaction)*	15	May 12
Special Report *(An AF system/MPTS)*	10	May 12
Field/Lab Report *(LaHave Forest)*	20	May 12
Quiz	15	May 07
Written Exam	30	May 11
Total	***100***	

Field study 1 (Virtual): 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 three-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 virtually*

Field study 2 (Virtual): "Lahave forests/ Lahave river berry farms" near Lunenburg.

a. Modern Agroforestry practices towards sustainability (Forest farming, Windbreak, Api-silviculture)
b. Different Multipurpose Tree Species and their contribution to soil fertility
c. 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 virtually*

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 online communications

Computer use (with reliable wifi) is vital (the only way to take part in lectures and activities) for this virtual field class (including for students' oral presentations). We will also rely on email/messages for communication among students and between students and teaching staff (instructor and teaching assistant) via BBL/ Dal email. Field reports and presentations will require the use of Excel (spreadsheets/graphs), Word, Power-point and a statistical software.

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Oral Presentation

Students are expected to do a 15-minute power point presentation 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 virtual lectures, field studies and Lab analyses are mandatory.
All components of this course are delivered synchronously (attendance mandatory).
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

Day	**Activity**
Day 1 (April 26, 2021) ***Monday***	Morning session 1. Introduction to Agroforestry 2. Practical Applications of Agroforestry Afternoon session 3. Agroforestry practices: Video
Day 2 (April 27, 2021) ***Tuesday***	Morning session 4. Agroforestry services/ Soil conservation 5. Successful Agroforestry approaches in Canada Afternoon session 6. Multipurpose Tree Species in Agroforestry Introduction to field study at Point Pleasant Park Tree identification
Day 3 (April 28, 2021) ***Wednesday***	Morning session 7. Field Study I/Virtual: Point Pleasant Park Tree-Plant Interaction/Data collection Afternoon session 8. Soil analysis & Data analysis (virtual)

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Day 4 (April 29, 2021) ***Thursday***	Morning session 9. Agroforestry Discussion Afternoon session 10. Temperate Agroforestry: Video
Day 5 (April 30, 2021) ***Friday***	Morning session 11. Agroforestry and the future *Brief Introduction on Field report and presentation* Afternoon session *12. Introduction to virtual field work at Lahave forests/Southshore farms and preparations*
Day 6 (May 01, 2021) ***Saturday*** (Lahave Forests/Haskap Berry Farms)	Morning session 13. Field Study II/Virtual Haskap and Agroforestry/Data collection Afternoon session 14. Soil analysis & Data analysis (virtual)
Day 7 (May 03, 2021) ***Monday***	15. Field Study II/Virtual *Statistical analysis: Continued (morning session only)*
Day 8 (May 04, 2020) ***Tuesday***	16. Students' discussion session *(with TAs/ morning session only)*
Day 9 (May 05, 2021) ***Wednesday***	Morning session 17. PPT/Oral presentation introduction, Field Report Introduction Afternoon session Final discussion on soil and statistical analyses
Day 10 (May 06, 2021) ***Thursday***	18. Field report and PPT preparation *(morning session only*)
Day 11 (May 07, 2021) ***Friday***	19. *Quiz (9:35 - 10:55 am) PPT preparation (12:05 pm to 2:25 pm)
Day 12 (May 08, 2021) ***Saturday***	Self study day/ Presentation & written report preparation day *(no virtual class)*
Day 13 (May 10, 2021) ***Monday***	20. Students' Oral Presentations *(morning session only)*

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Day14 (May 11, 2021) ***Tuesday***	Morning session 21. Written Exam: 2 hours (9:35 - 11:25 am) Afternoon session 22. Field report preparation (& submission)
Day 15 (May 12, 2021) ***Wednesday***	Deadline to submit; (11:30 pm/via BS) a. Brief report on "Tree-plant interaction" (Point pleasant park) b. Field report (LaHave forest) c. Special report on Multi-Purpose Tree Species

Morning and after-noon sessions are conducted during 0935-1155 and 1305-1425 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

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

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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

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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