

ENVS*3230 - Agroforestry Systems

Fall 2024 Course Outline

Section: 01

Credits: 0.50

Land Acknowledgement: Guelph

The University of Guelph resides on the ancestral lands of the Attawandaron people and the treaty lands and territory of the Mississaugas of the Credit. We recognize the significance of the Dish with One Spoon Covenant to this land and offer respect to our Anishinaabe, Haudenosaunee and Métis neighbours. Today, this gathering place is home to many First Nations, Inuit, and Métis peoples and acknowledging them reminds us of our important connection to this land where we work and learn.

Calendar Description

The planned and systematic integration of trees into the agricultural landscape can potentially result in sustainable environmental, ecological, economic and social benefits. The key aspects of deriving these benefits, associated science and management considerations, application potentials at the landscape level and adoption challenges will be discussed. Common temperate and tropical agroforestry systems (e.g. intercropping of trees and crops) will be discussed. Emphasis will be given to successful research and development case studies.

Prerequisite(s): 5.00 credits, (1 of BIOL*1040, BIOL*1050, BIOL*1070)

Department(s): School of Environmental Sciences

Course Description

The planned and systematic integration of trees into the agricultural landscape can potentially result in sustainable environmental, ecological, economic and social benefits. The key aspects of deriving these benefits, associated science and management considerations, application potentials at the landscape level and adoption challenges will be discussed. Common temperate and tropical agroforestry systems (e.g. intercropping of trees and crops, Riparian buffer systems, Windbreak systems, Silvopastoral systems, Forest Farming system) will be discussed. In addition, Problem solving techniques and Results-based Management (RBM) approach within the context of Agroforestry land-use establishment and management to achieve Food and Income securities in the African countries will be taught using real case studies. The course also involves field site visits to showcase different agroforestry land-use systems in the province of Ontario to enhance experiential learning. To incorporate evidence-based learning, agroforestry principles will be taught along with supporting research data / studies.

Lecture Schedule

MonWed 10:30am-11:20am in MINS*106 (9/5 to 12/13)

Lab Schedule

Day	Time	Location
Friday	3:30PM - 5:20PM	MACS 121

Instructor Information

Naresh Thevathasan, PhD, PAg, DSc.

Email: nthevath@uoguelph.ca

Office: Bovey 2116

Instructor's Welcome Message

I am excited to meet you all during the course. I have taught this course since 2007 and have received great appreciation from past students for the course content and for the materials covered. Agroforestry land-use is the only land-use that embraces all three dimensions of the production system – the environment, economics and society. This land-use system is more resilient to climate change and is therefore considered as the future of global

agricultural land-use practiced by more than 90% of the global farming communities. When climate-prone areas are considered, especially in sub-Saharan Africa, agroforestry is the land-use adopted by all many farming communities.

As we travel together through this course, you will also be exposed to Results-Based Management (RBM) techniques, a tool used to assess results and progress in international food security developmental projects and adopted by many international donors including the Global Affairs Canada.

At the end of the course, you will be trained and educated to act as an independent consultant in agroforestry land-use systems and should be able to write an independent proposal to solve or bring remedial measures for a land-use problem in any part of the world using agroforestry principles.

I really enjoy teaching this course as I bring experiences that I have gained over the last 26 years implementing agroforestry-based food security projects in Nepal, India, Egypt, Ghana, Rwanda, DR Congo, Tanzania, Sri Lanka and Chile.

Textbooks

Group	Title	Author	ISBN
Optional	North American Agroforestry: An Integrated Science and Practice	H.E. (Gene) Garrett, W.J. (Bill) Rietveld and R.F. (Dick) Fisher	978-0-89118-163-7
Optional	Temperate Agroforestry Systems	Andrew M. Gordon, Steven M. Newman and Brent Coleman	9781786393883 (ePub)
Optional	An Introduction to Agroforestry	P. K. Ramachandran Nair • B. Mohan Kumar • Vimala D. Nair	ISBN 978-3-030-75358-0 (eBook)

Learning Resources

Required Resources

Online Course Manual will be available on Courselink (<https://courselink.uoguelph.ca/shared/login/login.html>) in order to enhance and assist understanding of the lecture materials. But, regularly following the lectures is the key to understand the concepts and do well in examinations. Therefore, attendance is very important.

Virtual Labs

Numerous video links will be given during the lab times in order to complement the lecture materials and also to facilitate evidence-based learning experience.

Campus Resources

If you are concerned about any aspect of your academic program: Make an appointment with a Program Counsellor (<https://www.uoguelph.ca/uaic/programcounsellors/>) in your degree program. If you are struggling to succeed academically: There are numerous academic resources offered by the Learning Commons (<https://www.lib.uoguelph.ca/using-library/spaces/learning-commons/>) including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills.

Course Level Learning Outcomes

1. To familiarize students with approaches to agroforestry systems including theory, principles and scientific research.
2. To offer students an opportunity to develop solutions to present-day agricultural problems, food security and climate change mitigation options through agroforestry (AF) land-use systems and to improve their independent and creative thinking ability.
3. To explore potentials application of AF land-use systems in developed and developing countries to bring about food and income security, climate change mitigation strategies with supportive data / case studies and livelihood development.
4. To bring enhanced awareness to the importance of social dynamics associated with agroforestry and climate change mitigation projects
5. To educate and provide hands-on experience with preparing and presenting high quality written reports.
6. To provide an exposure to agroforestry project management skills including Results-based Management (RBM) techniques and Problem Solving Approaches.
7. Literacy: A term paper will be required of each student or from a group, and journal articles will be uploaded to the CourseLink page.
8. Sense of historical development. This course will explore the history of agroforestry and its impacts on human societies in the developing world. Emphasis will also be given to historical agroforestry development in the temperate region, especially in Canada.

9. Understanding forms of inquiry. The lecture portion of this course has been structured to follow the sequence of events in the process of scientific inquiry: (1) identification of driving issues related to land-use problems; (2) recognition of potential solutions through agroforestry systems (3) managing the system for environmental, ecological, economic and social benefits.
10. Depth and breadth of understanding: Current issues and research on temperate and tropical agroforestry will be explored through journal articles, which will require an increasing depth of understanding.

Extra

In addition, additional reading materials, videos and course manual will direct students to more information on specific topics that will not be covered entirely in lectures.

Exam Information

Mid-term Exams

There will be two mid-term examinations during the lab time slot as indicated below:

Mid-term 1: Friday, October 25, 2024

Mid-term 2: Friday, November 15, 2024

Final Exam

This course does not have a final exam but the students are expected to submit a final term paper. All term papers should be submitted by December 6, 2024 (Friday) via email to the Teaching Assistant (TBD) and the Instructor (nthevath@uoguelph.ca). There will be a 2% reduction per day for late submissions.

Lecture Schedule

Day	Date	Topic	Activities	Due
Mon	9/9	Introduction to the course		
Wed	9/11	Agroforestry the future of global land-use		
Mon	9/16	Introduction to Agroforestry - Part 1		
Wed	9/18	Introduction to Agroforestry - Part 2		
Mon	9/23	Tree-based intercropping systems and scientific principles		
Wed	9/25	Tree-based intercropping systems and scientific principles		
Mon	9/30	Tree-based intercropping systems and scientific principles		
Wed	10/2	Riparian buffer systems		
Mon	10/7	Riparian buffer systems		
Wed	10/9	Windbreak systems		
Mon	10/14	Thanksgiving Holiday		
Wed	10/16	Windbreak systems		
Mon	10/21	Silvopastoral systems		
Wed	10/23	Forest farming systems		
Mon	10/28	Problem solving techniques in relation to agroforestry land-use – world conservation strategies, driving forces of environmental problems, solvex model within the social context		

Wed	10/30	Problem solving techniques in relation to agroforestry land-use – world conservation strategies, driving forces of environmental problems, solvex model within the social context
Mon	11/4	Introduction to Results-based management (RBM)
Wed	11/6	Introduction to Logic model, performance measurement framework and risk registry
Mon	11/11	Case study discussions – Ghana
Wed	11/13	Case study discussions – Ghana
Mon	11/18	Indian case study discussion
Wed	11/20	Indian case study discussion
Mon	11/25	Final term paper discussion
Wed	11/27	Final term paper discussion

Lab / Seminar Schedule

No lab - September 6, 2024

Sept. 13, 2024

Video presentation on ecosystem services derived from agroforestry land-use

1. <https://www.youtube.com/watch?v=me5Bk0leiiE>
2. <https://www.youtube.com/watch?v=dniBlxXeels>
3. https://www.youtube.com/watch?v=C_J51vzeWSs
4. <https://www.youtube.com/watch?v=W441NafWZME>
5. https://www.youtube.com/watch?v=fZO_-rhwV0
6. https://www.youtube.com/watch?v=_2jWTYulaw0

<https://www.youtube.com/watch?v=tay-2VnFhUA>

Sept. 20, 2024 - Video presentation on Agroforestry for rural livelihoods

<https://www.youtube.com/watch?v=3r2BW34eRT8>

<https://www.youtube.com/watch?v=cfvYL-Acyec>

Sept. 27, 2024 Field tour - Bus

Video Presentations on Tree-based intercropping systems and field bus tour

1. <https://www.youtube.com/watch?v=b8Kwb5yInPM>
2. <https://www.youtube.com/watch?v=ZqqVX0lmc0I>
3. <https://www.youtube.com/watch?v=-1IVpmYqFfQ>
4. <https://www.youtube.com/watch?v=3qdHimPP6xo>
5. <https://www.youtube.com/watch?v=alWNQSVMEoA>

October 4, 2024 - Temperate Agroforestry systems

<https://www.youtube.com/watch?v=nuplHZRijqg>

Silvopasture systems

<https://www.youtube.com/watch?v=0InXB92ISik>

<https://www.youtube.com/watch?v=ZObl4E71YyA>

October 11, 2024- No Lab (Thanksgiving Weekend)

October 18, 2024 Riparian Buffer Research Site visit - Bus

Video presentations on Riparian buffer systems

<https://www.youtube.com/watch?v=WVYK83Hp2H0>

<https://www.youtube.com/watch?v=8HDnyV1ViHw>

October 25, 2024 - Mid-Term Examination 1 - During the lab time in the same room

Nov. 1, 2024- Agroforestry and Food security

<https://www.youtube.com/watch?v=XE2S6XGV8Pg>

<https://www.youtube.com/watch?v=l4Lqkodizil>

<https://www.youtube.com/watch?v=Ana5b9O6hiM>

<https://www.youtube.com/watch?v=7wUnvWpxgNQ>

<https://www.youtube.com/watch?v=4wcE32Sv63s>

Nov. 8, 2024 - Guest lecture Agroforestry in Iran by Dr. Amir Bazrgar

Nov. 15, 2024- Mid-Term Exam 2- in the Lab room

Nov. 22, 2024- Term paper preparation time

Nov. 29, 2024- Term paper preparation time

Assessment Breakdown

Description	Weighting (%)	Due Date
Mid-term 1	30%	Week 7 (October 25, 2024)
Mid-term 2	30%	Week 10 (November 15, 2024)
Final Term Paper	40%	Week 13 (December 6, 2024)

Assessment Details

Grading system - Final term paper

Grading system - Final term paper
Marking Schemes & Distributions

Final Term Paper

Weight: 40% of final grade

Length: 2,000 – 2,300 words

Description:

In this course, detailed accounts of all temperate and tropical agroforestry land-use systems for economic, ecological, environmental and social sustainability will be taught. You are required to select a particular land-use problem in Canada or in the world and you are required to provide a detailed account of the land-use problem based on starting issues, stakeholders involved and a description of the current biophysical environment.

You have to submit a term paper describing in detail an appropriate solution by designing an agroforestry land-use or a combination of agroforestry land-use systems, in order to resolve or find a sustainable solution to the selected problem. A descriptive account of your agroforestry-based solution/s, advantages and challenges related to the implementation will also be expected.

Mark Breakdown

Overall Paper Weight: /40

Breakdown:

Content: /17.5

Innovative ideas/Creativity/Theme: /10

Style/Flow/Organization: /7.5

Spell/Gram/Ref: /5

(2 marks off per day from the deadline submission date of December 8, 2023 – Mid-night)

Marking Scheme Template

Level	Category	Description	Example	Tasks Exemplifying the Level
Lower Level	Knowledge	Ability to recall previously learned material	Provide the definition of job satisfaction	Define, identify, list, name, recall
	Comprehension	Ability to grasp meaning of and explain ideas	Give examples of ways to find the main idea of a story	Interpret, describe, determine, discuss, explain
	Application	Ability to accurately use learned material in a new situation that may have a single or best answers	Apply the formula for a circle to real world problems	Apply, demonstrate, employ, illustrate. Practice, use, initiate
	Analysis	Ability to separate material into component parts and show relationships among parts	Compare and contrast the methods used by different European nations to colonize Africa	Distinguish, detect, categorize, compare, contrast, critique
	Synthesis	Ability to put together separate ideas to form a new whole , establish new relationships	Use knowledge of the areas of circles to derive a formula for the volume a cylinder	Arrange, assemble, create, design, plan, construct, devise
Higher Level	Evaluation	Ability to judge the worth of material against other criteria or standards	Assess the likely success of a change management program by basing one's thoughts on a thorough and accurate knowledge of the literature	Appraise, assess, critique, judge, test, choose

Last Day to Drop Course

The final day to drop Fall 2024 courses without academic penalty is the last day of classes: November 29

After this date, a mark will be recorded, whether course work is completed or not (a zero is assigned for missed tests/assignments). This mark will show on the student's transcript and will be calculated into their average.

Standard Statements for Undergraduate Courses

Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-misconduct/>) is outlined in the Undergraduate Calendar.

Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability. Use of the SAS Exam Centre requires students to make a booking at least 10 days in advance, and no later than the first business day in November, March or July as appropriate for the semester. Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time. For students at the Guelph campus, information can be found on the SAS website. (<https://www.uoguelph.ca/sas/>)

Accommodation of Religious Obligations

If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements.

See the Academic calendar for information on regulations and procedures for Academic Accommodations of Religious Obligations (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-accommodation-religious-obligations/>).

Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all undergraduate students except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in the Undergraduate Calendar - Dropping Courses (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/dropping-courses/>).

Email Communication

As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly. e-mail is the official route of communication between the University and its students.

Health and Wellbeing

The University of Guelph provides a wide range of health and wellbeing services at the Vaccarino Centre for Student Wellness (<https://wellness.uoguelph.ca/>). If you are concerned about your mental health and not sure where to start, connect with a Student Wellness Navigator (<https://wellness.uoguelph.ca/navigators/>) who can help develop a plan to manage and support your mental health or check out our mental wellbeing resources (<https://wellness.uoguelph.ca/shine-this-year/>). The Student Wellness team are here to help and welcome the opportunity to connect with you.

Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment).

Recording of Materials

Presentations that are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources

The Academic Calendars (<http://www.uoguelph.ca/registrar/calendars/?index>) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.

When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the Undergraduate Calendar for information on regulations and procedures for Academic Consideration. (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-consideration-appeals-petitions/>)