

Savannakhet University
Faculty of Agriculture and Environment

No _____ /.....
Place, Date ____ / ____ / ____

Course Syllabus

1 Program

Title of the study programme: Forest Resource Management

2 Course details

Course name: Agroforestry

Course code: FOA04AGR12215

Number of credits (hours/week): 2(1-2-3)

Course type (tick the appropriate box): Required, Elective, Other, if other please explain:

Prerequisites courses: soil conservation, landscape, silviculture, dendrology, botany etc.

Semester, in which the course is taught: *tick the appropriate box below*

Year 1		Year 2	
Semester 1	Semester 2	Semester 1	Semester 2
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3 Responsible unit: Office of Post-Graduate Study

3.1 Department: Department of Forestry Resource

Names and affiliations of lecturer(s): Ms. Phonesavan PHASAWATH, Department of Forestry Resource, Agriculture and Environment Faculty, Savannakhet University, Lao PDR. Tel: +856 20 23589678, Email: phone.svk2030@gmail.com

4 Course description

Agroforestry is a land-use systems in which trees or shrubs are grown in association with agricultural crops, pastures or livestock, and in which there are both ecological and economic interactions between the trees and other components. It has the combinations of trees with plants or animals thus result interactions between the tree and non-tree parts of the system. Agroforestry systems provide numerous ecological, environmental and economic advantages. They protect crops, livestock, soil and watercourses, stimulate biodiversity, contribute to carbon sequestration and even mitigate the effects of climate change. Furthermore, they create jobs, improve practices of agriculture and forestry, enhance the landscape and generate additional farm revenues.

5 Course objectives

- 1) To understand the need of agroforestry and the involved biophysical processes
- 2) To study the role of agroforestry systems in soil fertility and nutrient cycling

- 3) To examine the positive and negative tree-crops-soil interactions (for light, water and nutrients)
- 4) To be familiar with environmental conservation and international conventions, in particular the Convention on Climate Change, and the Convention on Biological Diversity, and how they relate to agroforestry systems.
- 5) To be aware of opportunities for employment and cash income through agroforestry systems
- 6) To appreciate how agroforestry innovations can make positive impact on economy and environment
- 7) To get a field experience in agroforestry and evaluate some multipurpose tree species

Knowledge:

Students are able to explain the background, definitions, and concepts of agroforestry, the classification, distribution, and characters of agroforestry systems and practices, the principles of species productivity and components interaction in agroforestry, roles of agroforestry for soil protection and productivity. Students are able to design and evaluate agroforestry system, graduates shall have known to understand agroforestry system and national development, project development and financial analysis of agroforestry systems and guidelines for the development of forest resources with agroforestry technology.

Skills:

Graduates must be able to apply the acquired knowledge of the agroforestry systems to explain characteristics of trees/shrubs/grasses for agroforestry. Volume and biomass estimation. Crown measurement, light interception and moisture measurement in agroforestry systems. Annual crops/grass growth measurements and yield estimation. Analysis of soil and plant samples for organic carbon N, P and K. Diagnosis and design - methodology. Survey agroforestry practices in local/adjoining areas.

Application of theories to practice:

Graduates must be able to apply theories of new technologies to be used to manage agroforestry systems in the most productive way without compromising the soil and the environment. They can analyze and evaluate the finances of the agroforestry system in operational investments. At the same time, graduate students can use agroforestry technology to encourage people to grow short-term, medium-term, and long-term crops, integrated animal husbandry for continuous and sustainable yields, as well as to maintain the fertility of the soil. They will be able to create agroforestry development projects to improve the quality of life of rural people.

Social knowledge and skills:

Graduates become experts/specialists on land-use systems in which trees or shrubs are grown in association with agricultural crops, pastures or livestock, and in which there are both ecological and economic interactions between the trees and other components. It has the combinations of trees with plants or animals thus result interactions between the tree and non-tree parts of the system. Agroforestry systems provide numerous ecological, environmental and economic advantages. They protect crops, livestock, soil and watercourses, stimulate biodiversity, contribute to carbon sequestration and even mitigate the effects of climate change. Furthermore, they create jobs, improve practices of agriculture and forestry, enhance the landscape and generate additional farm revenues.

5.1 Learning objectives of particular modules

- To understand the need of agroforestry and the involved biophysical processes
- To the most important attributes of four key elements of agroforestry systems: crops, livestock, trees and soil life.
- Can describes how agroforestry promotes soil health and conservation.
- Can outlines three guiding principles that are fundamental to successful agroforestry interventions.
- Can explains some important considerations in implementing design principles and translating design into practical action.
- Can presents guidance on ensuring adequate quality and quantity of seed and planting stock.
- Can describes the main activities needed to ensure that trees interact favourably with the other components of a system.
- Can presents generic characteristics of several widely used agroforestry systems.
- To appreciate how agroforestry innovations can make a positive impact on the economy and environment
- To be aware of opportunities for employment and cash income through agroforestry systems
- To get field experience in agroforestry and evaluate some multipurpose tree species

6 Course teaching methods

Lectures, collaborative teaching, discussion, learning by doing/group work, classroom lectures, homework, field trips, teaching and learning with a research process, experiments, research, data collection, analysis and criticism, conclusion and presentation, web-base teaching.

7 Teaching plan

Week	Content	Activity	Hours
1	Module 1: Introduction to Agroforestry	Lecture discussion	3
2	Module 2: Components of agroforestry systems	Lecture Brainstorming Assignments group work	4
3	Module 2: Components of agroforestry systems	Lecture Q&A	4
4	Module 3: Agroforestry systems as circular systems	Learning by doing Assignments	8



		group work	
5	Module 4: Principles of agroforestry design	Lecture exchange ideas	4
6	Module 4: Principles of agroforestry design	Lecture Brainstorming Q&A	6
7	Module 5: Co-design and establishment of agroforestry systems	Lecture Brainstorming Q&A	4
8	Module 5: Co-design and establishment of agroforestry systems	Lecture Q&A discussion	4
9	Midterm Examination	Writing exam	
10	Module 6: Planting material in agroforestry	Case studies	8
11	Module 6: Planting material in agroforestry	Identify the report title	8
12	Module 7: Management of trees in agroforestry systems	Lecture Q&A discussion	3
13	Module 7: Management of trees in agroforestry systems	Lecture Q&A discussion	3
14	Module 8: Economic aspects of Agroforestry (economic and financial analysis, marketing/valuation of agroforestry products and benefits)	Lecture Q&A discussion	6
15	Module 8: Economic aspects of Agroforestry (economic and financial analysis, marketing/valuation of agroforestry products and benefits)	Lecture Q&A discussion	3
16	Module 9: Guidelines for the development of forest resources with agroforestry technology	Presentation Discussion	8

17	Module 9: Guidelines for the development of forest resources with agroforestry technology	Discussion exchange ideas	8
18	Case studies from student research	Field work	
19	Review for Final Exam/additional week	Review	
20	Final examination	Writing exam	

8 Material needs

8.1 Course equipment: *link to equipment needs/purchases as part of the project*

pH meter; Photo meter (to measure the light intensity); Soil tools (augur or shovel) and nutrient testing kits; Tape measure; Hand-lenses; Paper/Polythene bags (small and medium sizes); Marker pens; Tags or labels; Field notebook; Ropes; Outdoor thermometer; Binoculars; Field guide (any flora of NS identification book); Digital camera

9 References

9.1 Compulsory reading list

Ben Raskin and Simone Osborn, 2019. THE AGROFORESTRY, HANDBOOK. ISBN: 978-1-904665-07-6

Gassner A and Dobie P. eds. 2022. *Agroforestry: A primer*. Design and management principles for people and the environment. Bogor, Indonesia: Center for International Forestry Research (CIFOR) and Nairobi: World Agroforestry (ICRAF).

The Center for Agroforestry, 2018. Training Manual for Applied Agroforestry Practices, University of Missouri.

9.2 Suggested reading list

Agea J G, Namirembe S, Bukenya M, Zziwa A & Waiswa (eds.). 2007. Design of Appropriate Agroforestry Interventions in Uganda. Fountain Publishers, Kampala Uganda. Paperback, ISBN 978-9970-02-677-7.

Alavalapati J.R.R., Mercer D.E. (eds.). 2004. Valuing Agroforestry Systems: Methods and Applications. Kluwer Academic Publishers, Dordrecht, The Netherlands. 314 p. ISBN 1-4020-2412-6.m

Gholz, H.L. (Ed.). 1987. Agroforestry: Realities, Possibilities and Potentials. Martinus Nijhoff Publishers in cooperation with ICRAF, Boston. 227p.

Jose, S. and Gordon, A. M. (eds). 2008. Toward Agroforestry Design: An Ecological Approach. Advances in Agroforestry 4. Springer Science, The Netherlands). 312p. ISBN 1-4020-4947-2.

Krishnamurthy, L., Nair, P.K.R., and Latt, C.R. (eds) 1993. *Directions in Agroforestry: A Quick Appraisal*. Kluwer Acad. Publishers, Dordrecht, The Netherlands. 186 p.

- Kumar, B. M. and Nair, P. K. R. (eds.). 2006. *Tropical Homegardens: A Time-Tested Example of Sustainable Agroforestry*. *Advances in Agroforestry 3*. Springer Science, Dordrecht, The Netherlands. ISBN 1-4020-4947-1.
- Nair, P. K. R. 1990. *The Prospects for Agroforestry in the Tropics*. World Bank Technical Paper No. 131. The World Bank, Washington, D.C. 77 p.
- Nair, P.K.R. (ed.) 1989. *Agroforestry Systems in the Tropics*. Kluwer Academic Publishers, Dordrecht, The Netherlands. 665 p.
- Nair, P.K.R. 1980. *Agroforestry Species - A Crop Sheets Manual*. ICRAF 003e, ICRAF, Nairobi. 336 p.
- Nair, P.K.R. 1984. *Soil Productivity Aspects of Agroforestry*. *Science & Practice of Agroforestry 1*. ICRAF, Nairobi, Kenya. 85 p.
- Ong, C.K. and P. Huxley. 1996. Tree-Crop Interactions, a Physiological Approach. CAB International in association with ICRAF, New York. 386p.
- Snelder, D. J. and Lasco, R. D. (eds.). (2008). *Smallholder Tree Growing for Rural Development and Environmental Service: Lessons from Asia*. *Advances in Agroforestry 6*. Springer Science, The Netherlands.
- Young, A. 1997. *Agro forestry for Soil Management*, 2nd ed., CABI Int'l.

10 Assessment of students

10.1 Description of assessment

- Attendance 10%
- Reporting 35%
- Midterm examination 20%
- Final examination 35%

10.2 Grade distribution and student assessment

Grading scale

Score level	Meaning		Total score	Scale
	(Lao)	(English)		
A	ດີເລີດ	(Excellent)	80-100	4.00
B+	ດີຫຼາຍ	(Very Good)	75-79	3.50
B	ດີ	(Good)	70-74	3.00
C+	ດີພໍໃຊ້	(Fairly Good)	65-69	2.50
C	ພໍໃຊ້	(Fair)	60-64	2.00



D+	ອ່ອນ	(Poor)	55-59	1.50
D	ອ່ອນຫຼາຍ	(Very Poor)	50-54	1.00
F	ຕົກ	(Fail)	0-49	0.00
I	ບໍ່ສົມບູນ (ຮຽນບໍ່ຄົບ)	(Incomplete)		

Place, Date/...../.....

Head of Department.....

Course Instructor

Dean of Faculty.....