Savannakhet University, Laos. No _____/.....

Place, Date ____/___/___

Course Syllabus

1 Program

1. Name of program:

English: Master of Science in Forest Resource Management (MSc in FRM)

2. Certificate name:

English: Master of Science in Forest Resource Management (MSc in FRM)

2 Course details

Course name: Wood analysis

Course code: FOA04WA21110

Number of credits (hours/week): 3(1-2-3) 2 hours lecture. 3 hours laboratory per week

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

Prerequisites courses: Anatomy of timber species; elements of botanical micro technique, fundamentals of microscopy, and fundamental properties: gross and minute structural characteristics of wood leading to identification.

Semester, in which the course is taught:

Year 1		Year 2	
Semester 1	**Semester 2**	**Semester 1**	**Semester 2**
☒	☐	☐	☐

3 Responsible unit

3.1 Department:

Names and affiliations of lecturer(s): Ms Somphaeng Boutsana E-mail: Sompheng.sku@gmail.com.

Names and affiliations of lecturer(s): Ms Somphaeng Boutsana, Department of Forestry Resource, Agriculture and Environment Faculty, Savannakhet University, Lao PDR. Tel: +856 20 91817859, Email: Sompheng.sku@gmail.com

4 Course description

Our wood analysis course is ideal for delegates who need to learn how to identify the most common structural timbers found within house construction. Using a variety of identification methods, our wood analysis course will help you develop the necessary practical skills. It will provide you with the know-how and skills required to recognize different types of softwood and hardwood visually, physically and through microscopic analysis.

5 Course objectives

This course equips students with the knowledge of the macro and micro-structure of softwoods and hardwoods and their relation with properties of wood. The course exposes students to wood identification skills and practices.

5.1 Learning objectives of particular modules

The course introduces basic tree growth and wood formation, detailing both the macroscopic and microscopic anatomy of hardwoods and softwoods:

- **Module 1**: The Importance of anatomical studies in areas of wood utilization- an overview
- **Module 2:** Introduction to trees, wood and its structure – softwoods and hardwoods and important soft wood and hard wood species from various forest types and plantations of Laos.
- **Module 3:** General features visible on logs, sleepers and converted material: sapwood, heartwood, growth rings, growth marks, colour, odor, taste, grain, texture, luster, figure and weight. Other components influencing wood quality such as knots, shakes, discoloration, deposition, gum, resins, and calceration.
- **Module 4:** Introduction of wood analysis for special cases in relation to properties of bamboo, canes, coconut, rattan and other fibrous lignocelluloses materials in wood-based local industry and handicap.
- **Module 5:** Introduction of using available tools and equipment for wood analysis in terms of laboratory case and field data collection case.
- **Module 6:** Introduction of microscopic features and identifying common softwoods and hardwoods by recognizing key.
  - Basic identifying different wood types by following indicators: the end grains, the grain pattern, hardness and weight of the wood.
- **Module 7: Field Trips -** Learning how to collect samples, tools and materials using and field work handbook (Including sample collection, ground survey, sample analysis and result reporting)

6 Course teaching methods

The course consists of lectures, seminars, group working projects, assignments, and field trips. Graduates are required to develop projects or essays to show the features of wood-anatomy (individual and group working projects).

Specify teaching methods used throughout the course are theory section and practical section that can see as below:

Theory section: (Inquiry-based Learning and flipped classrooms)

- Lecture and seminar (Instruction, and videos)
- Class participation (Conversation and group discussion)
- Assignment (Report, Instruction, group discussion and group presentation)
- Examination (Mid-term & Final)

Practical section:

- Field trips (Ground survey, sample collection)
- Group presentation

Laboratory section:

- Laboratory
- Laboratory Assignment and Exam

7 Teaching plan

The programme consists of courses and other requirements worth a total of 3 credits. One credit is equivalent to 2 hours of teaching (lecture or tutorial) or four hours of practical work/field work per week, total 96 hours.

Summarize: 1 semester; 18 weeks; 36 days; 144 hours. (Excluding field work will cover 5-10 days)

Focus on module-1 to module-6 (Theory, Laboratory and Field Trips)

Week	Content	Method/activity	Hours
	Module 1: The Importance of anatomical studies in areas of wood utilization- an overview.		
1	**Seminar topic:**	Lecturer provides instruction on lesson plan, course description,	**2**

	- Overview current forest status in Laos and long-term strategy in 2020-2025 on the forest management. - Overview the important of anatomical studies in area of wood analysis and utilization in Laos. - Review related organizations that working on woody analysis field in Laos.	expected learning outcomes. Students' assignment.	
2	**Theories**		**2**
	Module 2: Basic characteristics of important soft wood and hard wood species from various forest types and plantations of Laos.		
	Seminar topic: - Important soft wood species from various forest types and plantations in Laos and specify in Savannakhet province.	- Presentation of the soft wood species from various forest types. - Panel discussions - Group discussion among students	
	Practice		**3**
	Module 2: Basic characteristics of important soft wood species from various forest types and plantations of Laos.		
	Seminar topic: - Using recorded videos/pictures of soft wood species list in Laos to open discussion between students. - To discuss about basic characteristics of soft wood by using available wood samples.	- Presentation by videos and pictures. - Discuss on the important of the soft wood that be available in terms of use. - Group working projects.	
3	**Theories**		**2**
	Module 2: Basic characteristics of important hard wood species from various forest types and plantations of Laos.		
	Seminar topic:	- Presentation of the wood species from various forest types.	

	- Important wood species from various forest types and plantations in Laos and specify in Savannakhet province.	- Panel discussions - Group discussion among students	
	Practice **Module 2: Basic characteristics of important hard wood species from various forest types and plantations of Laos.**		**3**
	Seminar topic: - Using recorded videos/pictures of hard wood species list in Laos to open discussion between students. - To discuss about basic characteristics of hard wood by using 5-10 samples.	- Presentation by videos and pictures. - Discuss on the important of the hard wood that be available in terms of use. - Group working projects.	
4	**Theories** **Module 3: Learning basic knowledge about general features visible on wood features.**		**2**
	Seminar topic: - Learning basic knowledge about general features visible on logs, sleepers and converted material: sapwood, heartwood, growth rings, and wood growth marks.	- Presentation of basic knowledge by pictures/videos. - Lecture, discussion, video demonstration of wood features.	
	Practice **Module 3: Learning basic knowledge about general features visible on wood features.**		**3**
	- Basic knowledge regarding to microscope features visible on logs, sleepers and converted material and wood growth marks.	- Demonstration of microscope and a hand lens 10x - Students will follow implementing by working group.	
5	**Theories** **Module 3: Learning basic knowledge about general features visible on wood features.**		**2**
	Seminar topic:	- Presentation of basic knowledge by pictures/videos.	

	- Learning basic knowledge about general features visible on logs, sleepers and converted material: colour, odor, taste, grain, texture, luster, figure and weight.	- Lecture, discussion, video demonstration of wood features.	
	Practice		**3**
	Module 3: Learning basic knowledge about general features visible on wood features.		
	- Basic learning using laboratory tools regard to features visible on logs, sleepers and converted material: colour, odor, taste, grain, texture, luster, figure and weight.	- Demonstration of a hand lens 10x - Students will follow implementing by working group.	
6	**Theories**		**2**
	Module 3: General features visible and basic knowledge regard to microscopic		
	Seminar topic: - Learning basic knowledge about general features visible on other components influencing wood quality such as knots, shakes, discoloration, deposition, gum, resins, calceration.	- Presentation of basic knowledge by pictures/videos. - Lecture, discussion, video demonstration of wood features.	
	Practice		**3**
	Module 3: General features visible and basic knowledge regard to microscopic		
	- Practical learning basic knowledge about general features visible on other components influencing wood quality such as knots, shakes, discoloration, deposition, gum, resins, and calceration.	- Demonstration using tools in laboratory room. - Students will follow implementing by working group.	
7	**Theories**		**2**
	Module 4: Wood anatomy and properties of monocots.		
	- Basic knowledge about bamboo, canes, coconut, rattan and other fibrous lignocelluloses materials in wood-based local industry and handicaps.	- Presentation of basic knowledge by pictures/videos. - Lecture, discussion, video demonstration of wood features.	

	Practice		**3**
	Module 4: Wood anatomy in relation to properties of wood.		
	- Microscopic structure of bamboo, canes, coconut, rattan and other fibrous lignocelluloses materials in wood-based local industry and handicaps.	- Demonstration of microscope and a hand lens 10x - Students will follow implementing by working group.	
8	**Theories**		**2**
	Module 5: Introduction of using tools and equipment such as Hand Circular Saws and Circular Saws and other tools for wood cutting.		
	- Basic knowledge regard to tools and equipment such as Hand Circular Saws and Circular Saws and other tools for wood cutting.	- Presentation of basic knowledge by pictures/videos. - Lecture, discussion, video demonstration of tools using.	
	Practice		**3**
	Module 5: Introduction of using tools and equipment such as Hand Circular Saws and Circular Saws and other tools for wood cutting.		
	- Student will learn how to use about tools and equipment such as Hand Circular Saws and Circular Saws and other tools for wood cutting.	- Demonstration of Hand Circular Saws and Circular Saws for wood cutting. - Students will follow implementing by working group.	
9	**Theories**		**2**
	Module 6: Introduction of microscopic features and identifying common softwoods and hardwoods by recognizing key.		
	- Student will learn basic identifying different wood types by following indicators: the end grains, the grain pattern, hardness and weight of the wood.	- Continuous to teach presentation of basic knowledge by pictures/videos. - Lecture, discussion, video demonstration of different wood types.	
	Practice		**3**
	Module 6: Introduction of microscopic features and identifying common softwoods and hardwoods by recognizing key.		

	- Student will do practical of identifying different wood types by following indicators: the end grains, the grain pattern, hardness and weight of the wood.	- Lecturers will provide wood examples - student do a project assignment of student works (group working) on wood analysis. - Student will use microscopic to identify wood types.	
10	**Theories** **Module 7: Learning how to collect samples, tools and materials using and field work handbook (Including sample collection, ground survey, sample analysis and result reporting)**		**2**
	- Material, toolboxes providing - Understanding field work handbook.	Laboratory Equipment practice.	
	Practice		**3**
	Module 7: Learning how to collect sample, tools and materials using and field trips handbook (Including sample collection, ground survey, sample analysis and result reporting)		
	- Demonstrate how to use all related equipment. - Create survey/data record from that lead by lecturers.	- Demonstration of all field trip equipment by lecturers. - Students will follow implementing by working group. - Student will participate in forms creation.	
11	**Theories**		**2**
	Midterm-Examination	Writing examination	
	Practice		**2**
	Midterm-Examination	Group project presentation	
12-14	**Field trips**		**30**

	Field work to collect samples of soft woods from various forest type in Savannakhet province. - Target forest zone	Field trips activity lead by teacher to collect samples. At least 5 days. Student will look for samples of soft woods by cutting and use sample box.	
	Field trips		**30**
	Field work to collect samples of hard woods from various forest type in Savannakhet province. - Target forest zone	Field trips activity lead by lecturers to collect samples. At least 5 days. Student will look for samples of hard woods by cutting and use sample box.	
15	**Practice**		
	Microscopic features of soft woods and hard woods. Characteristics, diagnostic features used in wood identification of available soft wood species and hard wood species - To microscopic features available Samples by characteristics and diagnostic features.	Analysis in laboratory room	**3**
	Laboratory assignment and presentation of the results of microscopic.	Group report on project assignment of student works (group working) on wood	**3**
16	Conclusion and review	Lecture and discussion	**4**
17	Laboratory revison	Lecture and discussion	**4**
18	Laboratory Examination (Practice)		**4**
19	**Theories**		**2**
	Final-Examination	Writing exam	
20	**Practice**		**2**
	Final-Examination	Individual project presentation	

8 Material needs

8.1 Course equipment:

Laboratory supplies

The supplies will be available for purchase in the laboratory sessions.

a) Box of approximately 10 wood samples

b) 10X hand lens

c) Utility knife with retractable blade

d) Hand saw.

e) Hand Circular Saws

f) Circular Saws

g) Digital weighing scale FC-si/FC-i

h) Microscope

i) Hand gloves

j) Eyes protection glasses

k) Electric tool drill

l) Moisture meter

m) Belt Sander

n) Repair tools sets

9 References

9.1 Compulsory reading list

The Anatomy of Wood. Wilson K. and D.J.B. White. 1986. Stobart & Son. ISBN 0-85442-033-9. 309pp.

9.2 Suggested reading list

- Identifying Wood, Accurate results with simple tools. Hoadley, R.B., 1990. Taunton Press. ISBN 0-942391-04-7. 223pp.

- Textbook of Wood Technology. Panshin A.J. and C. deZeeuw. 1980. McGraw-Hill. ISBN 0-07-048441-4. 722pp.

- Trees of Laos and Vietnam: a field guide to 100 economically or ecologically important species. Hoang Van Sam, Khamseng Nanthavong & P.J.A. KeSSler., 10 December 2004.

- Lao Cypress Forests: Causes of Degradation and the Present State of Conservation in Lao P.D.R. Masanobu Yamane and Khampha Chanthirath., March 10, 2000.

- Status of forest genetic resources conservation and management in Lao PDR, Chansamone Phongoudome and Khamphone Mounlamai., 2001.

- Textbook of Wood Characteristics: Description, Causes, Prevention, Impact on Use and Technological Adaptation, Springer Cham Heidelberg 2010.

10 Assessment of students

10.1 Description of assessment

10 Outstanding 100% punctual attendance and on-time assignment completion. Excellent attitude and effort. Volunteers numerous critical contributions. Facilitates the learning of others.

8 Very good Near 100% punctual attendance. Assignments completed on-time. Positive attitude and high level of effort. Demonstrates active support for colleagues. High level of critical contribution.

6 Adequate Only 2-3 sessions of non-punctual/non-attendance. Assignments completed on-time. Satisfactory effort and attitude. Demonstrates passive support for colleagues. Contributes somewhat to class and laboratory processes.

4 Minimal More than 2-3 sessions of non-punctual/non-attendance. Some assignments not completed on-time. Motivation and initiative low. Minimal level of effort. Little contribution and support offered during class and laboratory processes.

2 Poor Poor punctual and attendance record. Many assignments not completed on-time. Attitude, participation and effort do not meet acceptable standard. Zero contribution and support during class and laboratory processes.

10.2 Grade distribution and student assessment

Course Grading:

20% - Midterm Exam

10% - Laboratory Practical Exam

25% - Comprehensive Final Exam

30% - Laboratory Assignments/Problems/Problem-Based Learning Exercises

10% - Weekly quizzes (weekly report as appropriate)

5% - Attendance

Grading scale

Score level	Meaning		Total score	Scale
Symbol	(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.....