

Institution name here

No _____/.....

Place, Date ____/____/____

Course Syllabus

1 Program

Title of the study programme: *Wood processing technology*

2 Course details

Course name: *Technology of wood protection*

Course code: FOA04TWP11109

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

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

Prerequisites courses: *wood preservation, wood protection, maintenance of wood*

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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3 Responsible unit

3.1 **Department:** Department of forest resource

Names and affiliations of lecturer(s): Surasit Chanthalangsy, Phone: +85620 55295444

.Email: sitpcz@gmail.com; Work place: Savannakhet University, Savannakhet Province, Lao PDR.

4 Course description

The course will focus on different methods for the principles of wood protection. Especially, natural durability, cause and nature conditions of attack by various wood-biodegrading organisms. Types of wood protectives, merits-demerits of different preservative compositions in relation. In addition,

also apply penetration and retention of preservative on wood structure and permeability, processing of wood for treatment and maintenance of wood.

5 Course objectives

The students achieve a detailed understanding of the importance of wood protectives and approaches in wood preservatives. They achieve profound and evaluate skills in the field of wood protection, processing of wood for treatment, inspection of treatment quality, wood damage and degradation

Knowledge: graduates shall have understanding on method of preserve wood from decay, wood treatment processing, wood preserve. Application of resistant chemical, and measures for safety health, and the environment.

Skills: shall be able to apply the acquired knowledge in the wood industry, working on timber constructions, planning wood manufacturing processes and developing functional, cost-effective products. and can also introduce techniques for the use of preservatives, wood modification and economic characteristics, as well as investment in the wood preservation industry.

Application of theories to practice: Graduates will be applying research and teach in educational institutions by bringing knowledge and theories to the forefront of operations or work with relative section of wood products. In addition, can also apply knowledge in the management of wood products and maintenance to be effective.

Social knowledge and skills: Graduates will be analyze form opinions on technology in the preservation of wood products, wood biology, technical applications and projects on process and product management. can also apply the relevant topics in the field of preservation of wood products or other related fields.

5.1 Learning objectives of particular modules

The course is composed of 5 modules:

Module 1: Introduction to Wood durability

- This module is to provide graduate to remember and understanding with the proper wood structure and properties, types and principles of natural durability of wood

Module 2: Wood Biodeterioration

- This module is to provide graduate to understanding and practice with the wood-biodegrading organisms and inorganisms on condition

Module 3: Wood Protection

- This module is to provide graduate to apply with steps of chemical protection of wood and safely operate application tools, technologies of chemical protection of wood

Module 4: Modifying Protection of Wood

- This module is to provide graduate to analyze with the methodology, ecology and effectiveness of wood modification and appropriate tools for thermally modified wood

Module 5: Maintenance of Wood and Restoration of Damaged Wood

- This module is to provide graduate to evaluate with the wood maintenance in exteriors and interiors, sterilization of biological, conservation and renovation damaged wood

6 Course teaching methods

The course is conducted of two main parts:

- 1) Weeks theoretical in class, including lectures, video demonstration weekly assignments.
- 2) Weeks practical full-time training, conducted through lectures, laboratory, workshop, field studies, factory visits and other....

7 Teaching plan

Week	Content	Method/activity	Hours
1	Introduction to technology of wood protection Module 1: Wood durability Module 2: Wood biodeterioration Module 3: Wood Protection Module 4: Modifying protection of wood Module 5: Maintenance of wood and restoration of damaged wood	Lecturer provides instruction on lesson plan, course description, expected learning outcomes and brainstorming	2
2	Theories		2
	Module 1: Wood durability		



	Wood structure and properties, types and principles of wood degradation	Lecture, video demonstration and personalized learning	
	Practice		
	Assignment: Quizzes and struments	Individual project, classroom discussions and student presentations	2
3	Theories		2
	Module 1: Wood durability		
	Methods of wood protection for improvement its durability	Lecture, discussion, video demonstration and brainstorming	
	Laboratory		2
Laboratory experiment: Testing and evaluation of wood durability in nature condition and other...	Group discussions, panel discussions and student presentations		
4	Theories		2
	Module 2: Wood Biodeterioration		
	Wood damaged thermally and by fire, weather factors, and aggressive chemicals	Lecture, video demonstration and flipped classrooms	
	Practice		2
Assignment: Quizzes and struments	Individual project, classroom discussions and student presentations		
5	Theories		2
	Module 2: Wood Biodeterioration		
	Wood damaged by bacteria, fungi and insects	Lecture, video demonstration and classroom discusson	
	Practice		2
Assignment: Quizzes and struments	Individual project, classroom discussions and student presentations		
6	Theories		2
	Module 2: Wood Biodeterioration		
	Mechanisms of wood biodegradation, properties of biologically and abiologically damaged wood	Lecture, discussion, video demonstration and case studies	
	Practice		2
Seminar topic: Examination of test specimens and demonstration of accelerated test method	Group discussions, panel discussions and student presentations		
7	Theories		2
	Module 3: Wood protection		



	Methodology, ecology and regulation of chemical protection of wood	Lecture, video demonstration and flipped classrooms	
	Practice		
	Personalized learning: Quizzes and struments	Video lessons, scrapbook	2
8	Theories		2
	Module 3: Wood protection		
	Preservatives for wood protection	Lecture, discussion, video demonstration and class projects	
	Practice		2
Seminar topic: Chemical used for wood protection	Guest speaker, group discussions, panel discussions and presentation		
9	Mid-term examination		2
10	Theories		2
	Module 3: Wood Protection		
	Technologies of chemical protection of wood	Lecture, discussion, video demonstration and case studies	
	Practice		2
Seminar topic: Technologies of chemical protection of wood	Guest speaker, group discussions, panel discussions and presentation		
11	Theories		2
	Module 3: Wood Protection		
	Chemical protection of wooden composites	Lecture, discussion, video demonstration and class projects	
	Practice		2
Laboratory experiment: Examination of test specimens and demonstration of accelerated test method	Group discussions, panel discussions and student presentations		
12	Theories		8
	Field trip		
	Practice		8
Field trip			
13	Theories		2
	Module 4: Modifying protection of wood		
	Methodology, ecology and effectiveness of wood modification	Lecture, video demonstration and flipped classrooms	



	Practice		
	Personalized learning: Quizzes and struments	Video lessons, scrapbook	2
14	Theories		2
	Module 4: Modifying protection of wood		
	Thermally modified wood	Lecture, discussion, video demonstration and case studies	
	Practice		2
Seminar topic: Modify wood material and improve mechanical strength properties by THM, VTC TVM, and TH	Guest speaker, group discussions, panel discussions and presentation		
15	Theories		2
	Module 4: Modifying protection of wood		
	Chemically and biologically modified wood	Lecture, discussion, video demonstration and case studies	
	Practice		2
Seminar topic: Modify wood material and improve mechanical strength properties by THM, VTC TVM, and TH (cont)	Guest speaker, group discussions, panel discussions and presentation		
16	Theories		2
	Module 5: Maintenance of wood and restoration of damaged wood		
	Wood maintenance and diagnosis of damaged wood	Lecture, video demonstration and flipped classrooms	
	Practice		2
Assignment: Quizzes and struments	Individual project, classroom discussions and student presentations		
17	Theories		2
	Module 5: Maintenance of wood and restoration of damaged wood		
	Sterilization of biologically, conservation, and renovation of damaged wood	Lecture, discussion, video demonstration and case studies	
	Practice		2
Seminar topic: diagnosis of wood and structure about damage, quality, status, and safety	Guest speaker, group discussions, panel discussions and presentation		
	Theories		

18	Field trip		8
	Practice		8
	Field trip		
Final Examination			

8 Material needs

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

- Belt Sander
- Spray Painting Machine
- Table Circular Saws
- SHAKING WATER BATH
- Electric Kilns
- MOISTURE METER

8.2 Information sources

- Library
- Internet.

9 References

9.1 Compulsory reading list

- Ladislav Reinprecht. 2016. Wood Deterioration, Protection and Maintenance
- R A Eaton and M D C Hale. 1993. Wood: decay, pests, and protection.
- FAO. 1986. Wood preservation manual. Mechanical Wood Products; Branch Forest Industries Division; FAD Forestry Department, FAO Forestry Paper 70.
- United States Department of Agriculture, Wood Handbook: Wood as an Engineering Material (Washington, DC: USDA, Forest Service, Agriculture Handbook No. 72, US Government Printing Office, 1987)
- Esa Salminen et al. 2014. Wood preservation with chemicals; Best Available Techniques (BAT), Nordic Council of Ministers

9.2 Suggested reading list

- National Research Institute of Culture Heritage.2012. conservation of wooden objects.
<https://primastoria.files.wordpress.com/2014/10/wood-conservation-nrich.pdf>
- Emmanuel Uchechukwu Opara and Jacob Mayowa Owoyemi. 2018. Wood Protection Technologies: A Key Solution to Dwindling Timber Resources (The Nigerian Experience).
https://www.researchgate.net/publication/326059867_Wood_Protection_Technologies_A_Key_Solution_to_Dwindling_Timber_Resources_The_Nigerian_Experience
- Sonia Panigrahi and Sadhna Tripathy. 2019. Enhancement of Technology from Old Preservatives to New Preservatives and Latest Development in the Field of Preservation. Int.J.Curr.Microbiol.App.Sci. 8(01): 2173-2182. <https://www.ijcmas.com/8-1-2019/Sonia%20Panigrahi%20and%20Sadhna%20Tripathy.pdf>
- Descamps, Françoise, ed. 2006. *Methodology for the Conservation of Polychromed Wooden Altarpieces: An International Conference Organized by the Getty Conservation Institute and the Instituto Andaluz del Patrimonio Histórico, Seville, May 2002*. Sevilla; Los Angeles, CA: Junta de Andalucía; J. Paul Getty Trust. <https://pdfroom.com/books/methodology-for-the-conservation-of-polychromed-wooden-altarpieces/NpgpZEBE5jr>

10 Assessment of students

10.1 Description of assessment

Grades will be based on performance in the test and quizzes. In addition, students will be given periodic quizzes to test comprehension of the text readings. The majority of the grade though, will be based on performance in assignment and exam.

10.2 Grade distribution and student assessment

Grade distribution:

- (1) Class Attendant 10%
- (2) Reports/Assignment submission 30%
- (3) Mid-term 20%
- (4) Final Exam 40%
- (5) Other...

Grading scale

Grade	Total score	Scale
-------	-------------	-------



Symbol	Verbal grade		
A	Excellent	90-100	4.00
B+	Very good	80-89	3.50
B	Good	70-79	3.00
C+	Fairly good	65-69	2.50
C	Fair	60-64	2.00
D+	Poor	55-59	1.50
D	Very poor	50-54	1.00
F	Fail	0-49	0
I	Incomplete	0	0

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