



Department of forestry

College of Agriculture Engineering Sciences

University of salahddin

Subject: Wood Industry

Course Book – 4th Year

**Lecturer name: Assist lecturer. Shaymaa H.
Mahmood**

Academic Year: 2021/2022

Course Book

1. Course name	Wood Industry
2. Lecturer in charge	Assist Lecturer Shaymaa Hani Mahmood
3. Department/ College	Forestry / Agriculture Engineering Sciences
4. Contact	Tel: (optional)
5. Time (in hours) per week	Theory: 0 Practical: 3
6. Office hours	Monday, Tuesday, Wednesday
7. Course code	
8. Teacher's academic profile	I finished my B.Sc in Erbil Salahddin University- Agriculture college - Forestry department 2012 -2013. I started my M.Sc (Wood industry) in Salahddin University-Agriculture college-forest 2015-2016.Now a day I am working as assistant lecturer in Agriculture Engineering Sciences college-Forestry department.
9. Keywords	
10. Course overview:	
<ul style="list-style-type: none"> ▪ The importance of studying the subject ▪ Understanding of the fundamental concepts of the course ▪ Principles and theories of the course ▪ A sound knowledge of the major areas of the subject ▪ Sufficient knowledge and understanding to secure employment 	
11. Course objective:	
<ol style="list-style-type: none"> 1- Introduction and definition. 2- General manufacturing for Wood-based Panels; Product and Performance standards. 3- Types of Plywood, processing considerations and classification; Particle and Fiber composites production processes; Non-wood composites; Adhesive. 4- To help students relate the fundamental theory learned to practical field work. 5- To enable students interact with people already in the field who are their potential employers after studies. 6- Understand and describe the process, equipment and operations used in manufacturing wood-based composite products including plywood, 	

<p>particleboard.</p> <p>7- Understand and describe the types adhesives used in manufacturing wood products and composites.</p>	
<p>12. Student's obligation The student must attend the classes and prepare for the tests, assignment reports, and quizzes.</p>	
<p>13. Forms of teaching Practical part (Two exams:25 % and student activity +Quiz 10%) Note: All lectures are explained by power point, using samples and video.</p>	
<p>14. Assessment scheme Distribution of grades for this subject during the course are as follows:- 35 degree distributed as follow: Practical part (Two exams:25 % and student activity +Quiz 10%).</p>	
<p>15. Student learning outcome:</p>	
<p>16. Course Reading List and References: 1- Bulian,franco and jon A.graistone., industrial wood coatings. British Library Cataloguing in Publication Data A catalogue record for this book is available from the British Library . First edition (2009). 2- Charles R. Frihart., Wood Adhesion and Adhesives. USDA, Forest Service, Forest Products Laboratory, Madison (2005). 3- قصير, وليد عبودي.الصناعات الخشبية, وزارة التعليم العالي والبحث العلمي جامعة موصل (1990) .</p>	
17. The Topics:	Lecturer's name
None	
18. Practical Topics (If there is any)	
Week 1: Adhesives 1- General Introduction about forest. 1- General Introduction About Forest. 2- Definition of Adhesives and Adhesive Bonding. 3- Classification of Adhesives. 4- How does it work? 5-Requirements of a Good Bond.	Miss Shaymaa H. Mahmood 3h

- 6- The effect of wood properties on the process of gluing.
- 7- Properties of glue.
- 8- Working and strength properties of adhesives, with typical uses.
- 9- Adhesion.
- 10- Factors that influence the adhesion.

Week 2: Particleboard Manufacture

- 1- General Description.
- 2- Classification.
- 3- Manufacturing Process.
- 4- Properties variables.

Week 3 : Veneer and Plywood Manufacturing

- 1- Raw material.
- 2- Log Preparation.
- 3- Qualities of logs.
- 4- Peeling.
- 5- Clipping.
- 6- Drying.
- 7- Finishing.

Week 4: Oriented Strand Board (OSB).

- 1- OSB definition.
- 2- Manufacturing Processes.
- 3- Types of OSB.
- 4- Advantages of OSB.

Week 5: (Exam 1)

Week 6 : Lumber manufacturing

- 1- Raw Materials .
- 2- The Manufacturing Process .
- 3- Felling.

- 4- Debarking and bucking .
- 5- Headrig sawing large logs .
- 6- Bandsawing small logs .
- 7- Resawing .
- 8- Drying or seasoning .
- 9- Planing.
- 10- Grade stamping and banding .

Week 7: Pulp and Paper Making

- 1- Introduction.
- 2- Raw Materials Derived from Renewable Resources.
- 3- Pulping Processes.
- 4- Chemical Pulping.
- 5- Mechanical Pulping.

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Week 8;

- 1- Chemo-Mechanical or Semi Chemical.
- 2- Waste Repulping .
- 3- Washing .
- 4- Beating and Refining .
- 5 -Bleaching Processes .
- 6-Paper Making Chemicals.
- 7-Major Grades of Paper

Week 10: Scientific Trip to college of Engineering .

Week11 : production of round timbers and mine timbers

- 1- Poles.
- 2- Species.
- 3- Shaving of poles.
- 4- Farming of poles.
- 5- Age of poles.
- 6- Bark removal.
- 7- mines

Week 12 : (Exam 2)

Q1/ Short answer this question

- A- List five Tree species used for pole manufacture.
- B- List five Tree species used for veneer manufacture.
- D- What are the Wood pole benefits?
- E- What are the Properties of glue?
- F- What is the Number of layer or particle distribution between face & core?
- G- List the basic Manufacturing Steps of particle board manufacturing.
- H- List the steps of Log preparation for veneer manufacturing.
- I- Qualities of logs use from Veneer products.

Q2/ Answer the following True or False and corrected the False statements.

Answer only 4 questions

- 1- The Minimum distance between stacks is 2.5 m. This will guarantee the air flow necessary for natural drying.
- 2- The glue must be a solid at gluing time.
- 3- Casein has the ability to hold two materials together by surface attachment.
- 4- The wet veneer is fed through a drier to reduce its moisture content to about 8% from the 'green' moisture content of between 40-140%.
- 5- It is good practice to 'condition' the log before peeling. This can be achieved by water sprays, immersing in cold or heated water, or by steam treatment.
- 6- In Mechanical Pulping the Yield - high but pulp unsuitable for many uses due to lignin content which stiffens fibers.
- 7- Freeness Measured by rate of water passing through set amount of fiber formed on wire mesh well beaten fiber does not allow water to pass.
- 8- Extractives might give you problems in Gluing.
- 9- Freshly machined surfaces glue better than old ones.
- 10- Softwoods are generally more expensive than Hardwood and are used for flooring, cabinetry, paneling, doors.
- 11- Blending is the process of adding the adhesive resin and wax to particles

Q3/ Fill in the blanks for each of the following statements answer only .

- 1- pressure till complete absorption is achieved since this treatment ensures the largest possible absorption depth and quantity ofagent.
 - a- Impregnation, b- debarked poles, c- Control of Impregnation.
- 2- Those with nominal thicknesses of 2 in (5 cm) but less than 5 in (13 cm) are classified as.....
 - a- Dimension, b- timbers. c- Lumber.
- 3- In lumber manufacturing the Hardwoods are available in lengths from

- a- 4-16 ft (1.2-4.8 m). b- 4-24 ft (1.2-7.3 m). c- 3.5 in (8.9 cm).
- 4- Chemical substance is in the aggregation as paste consisting of the basic chemical elements such is
- a- Copper additions, b- boron additions, c- a and b additions.
- 5- a piece of wood chopped from a block by a large knife or hammer, as by a pulpwood chipper. Usually reduced to smaller size before use.
- A. Chip. b- Wafer. c- Flake. d- Shaving.
- 6- The wet veneer is fed through a drier to reduce its moisture content to about from the 'green' moisture content of between 40-140%.
- A- 8%, b- 9%, c-10%, d-11%.
- 7- is a generic term that applies to various lengths of wood used as construction materials.
- A- Lumber, b- Particleboard, c- Veneer, d- plywood.
- 8- With nominal thicknesses of 5 in (12.5 cm) and greater are classified as. .
- A- Dimension, b- timbers, c- boards.

20. Extra notes:

The course needs labs in future.

21. Peer review

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