



THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

Department of Forestry and Wood Technology

FWT 312 – Wood Based Panel Products

COURSE PARTICULARS

Course Code: FWT 312

Course Title: Wood Based Panel Products

No. of Units: 3

Course Duration: 2 hours of theory and 3 hours of practicals per week for 15 weeks.

Status: Compulsory

Course Webpage:

Prerequisite: NIL

COURSE INSTRUCTORS

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COURSE DESCRIPTION

Definitions of wood based panel products. Importance of wood based-panel production. Sustainable production of wood based panel products. Wood-based panel manufacturing:

plywood, particleboard and fibreboard (raw materials and manufacturing processes; properties and uses). Other variants: Plywood (blockboard, laminboard and battenboard); particleboard (cement-bonded particleboard); fibreboard (hardboard, softboard). Quality assurance and environmental impact of wood based panel products manufacturing.

COURSE OBJECTIVES

The objectives of this course are to:

- provide the student with the basic underlying principles guiding the production of wood based panel products in order to enable them apply the knowledge gained to solve industrial challenges in the future; and
- furnish the students with an understanding of the fundamentals of wood-based composites: processing, products evaluation and applications in the marketplace.

COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will be able to:

(Knowledge based)

- describe the basic principles of raw material selection/modification towards innovative composites production; and
- explain the manufacturing processes and how they affect wood composites' properties and utilization
- describe the archetypal properties of wood composites

(Skills)

- produce wood based panel products
- competence in monitoring quality control of wood composites production

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Class Attendance	5%
Assignments	5%
Practicals	20%
Test(s)	10%
<u>Final Examination</u>	<u>60%</u>
<u>TOTAL</u>	<u>100%</u>

GENERAL INSTRUCTIONS

Attendance: It is expected that every student will be in class for lectures and also participate in all practical exercises. Attendance records will be kept and used to determine each person's qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with any of the instructors, indicating the reason for the absence.

Academic Integrity: Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person's work and submit it as your own; that is plagiarism. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in accordance with the guidelines for handling students' misconduct as spelt out in the Students' Handbook.

Assignments and Group Work: Students are expected to submit assignments as scheduled. **No late assignments will be accepted without prior arrangement.** Missing assignments due to improper submission by the student will be given a grade of zero.

Code of Conduct in Lecture Rooms and Laboratories: Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, *etc.*) during lectures. Food and drinks are not permitted in the laboratories. Cover shoe should be wear to the lab.

READING LIST

²⁻³Rowell R.M. (2006). *Handbook of Wood Composites and Chemistry*, CRC press.

⁴Maloney, T.M. (1993). *Modern Particleboard and Dry-Process Fiberboard Manufacturing*. 3rd Edition. Miller Freeman Inc., San Francisco, [ISBN 0-87939-288-7].

²⁻³Forest Products Laboratory. 2010. Wood handbook—Wood as an engineering material. General Technical Report FPL-GTR-190. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory. 508 p.

²⁻³Klyosov, A.A. (2007). *Wood-Plastic Composites*. 1st Edition. John Wiley & Sons, USA. 698p. [ISBN 978-0-470-14891-4].

²⁻³Baillie, C. (2004). *Green Composites - Polymer Composites and the Environment*. Woodhead Publishing. Cambridge England. 299p. [ISBN 0-8493-2576-5].

²⁻³Lee S.M. (1993). *Handbook of Composite Reinforcements*. Wiley-VCH. 693p. [ISBN 0-47-1-1886-1]

Legend

- 1- Available in the University Library
- 2- Available in Departmental/School Libraries
- 3- Available as Personal Collection

COURSE OUTLINE

Week	Lecture	Laboratory
1	Introduction to wood based panel General manufacturing Issues Wood adhesives	Manufacturing processes (Lecture instead of Lab.)
2-4	Process of veneer-based products <ul style="list-style-type: none"> • Plywood • Glued laminated lumber (Glulam) • Structural laminated lumber 	Safety issues will be discussed.
5	Particleboards	Resin bonded particleboard production
6	Oriented strand board Waferboard Flakeboard	Resin bonded particleboard production
7	Review for the Mid Semester Test Fiber cement bonded board	MID-SEMESTER TEST
8	MID-SEMESTER BREAK	MID-SEMESTER BREAK
9 & 10	Wood-plastic composite	Fiber cement bonded board production
11 & 12	Fiber-based <ul style="list-style-type: none"> • Medium-density fiberboard • Hardboard • Insulation board 	Wood-plastic composite
13	Quality control in the wood-based panel industry	Wood-plastic composite
14	Environmental issues with wood based panels production	No Lab
15	REVISION	No Lab

Laboratory content:

- Production of particleboard (cement bonded composites, resin bonded composites, wood plastic composites)
- Testing of wood-based panel composites
- Submission of the laboratory report is due 2 weeks after the Lab is conducted