

I. COURSE DESCRIPTION:

This course introduces students to the basic theories and technologies, manufacturing processes, properties and uses of the range of modern engineered wood products. Products include waferboard, oriented strandboard, flakeboard, particleboard, insulationboard and fiberboard and are made from logs, sawmill wastes and pulpmill wastes. The course covers the theory, application and curing technologies related to the chemical aspects of board manufacture that are common to all of the above named products. The process equipment used in manufacture is also discussed in some detail.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Demonstrate an understanding of the various types of engineered wood products being manufactured.

Potential Elements of the Performance:

Describe the driving forces in society today that have necessitated the development of composite wood products from solid wood and plywood products.

Describe the classification of wood composite boards by particle size, density and manufacturing process.

Define wood-based fibre and particle materials, fibrous felted boards, particleboard, wood-cement board, insulation board, flakeboard, waferboard, MDF, OSB and molded products and how they differ.

Describe, in general terms, the history of composite wood products.

Describe the differences between wet-process and dry-process composite board manufacture and the properties of each.

Describe the four main characteristics of composite wood products that make them attractive compared to solid wood products or plywood.

Identify the major markets for each of the various composite wood products and what products they compete against.

Describe the five fiberboard processes and how they differ.

2. Demonstrate an understanding of the chemical aspects of fiberboard manufacture

Potential Elements of the Performance:

Describe the various components of wood and wood cells and how they impact on composite wood manufacture.

Describe the breakdown of solid wood into its chemical components.

Describe the chemical reactions that take place during fiberboard manufacture and their importance to composite wood products.

Describe the various aspects of the chemistry of the adhesive bonds in composite wood products.

Describe the manufacture, bonding properties, chemistry and importance of synthetic and natural resins to the composite wood products industry.

Describe the purpose or function of catalysts in the manufacturing process.

Describe the purpose and use of scavengers, waxes, preservatives and fire retardants in the composite wood products industry.

3. Demonstrate a knowledge of the process equipment used in the composite wood products industry.

Potential Elements of the Performance:

Describe the differences in operation between a pulp wood chipper and a composite wood products flaker.

Describe the operation of the various types of flakers in common use in the industry.

List and describe the operating factors that determine the dimensions and the quality of flakes produced by a flaker.

Explain the basic operation of a fibre refiner.

Discuss the concept of chip pretreatment before refining.

Explain the differences between single revolving disc refiners, pump through refiners, double revolving disc refiners and double revolving disc pressurized refiners.

Discuss the effect of refiner plate design on the type of fibre that is produced.

Explain the importance of fibre drying to the composite board manufacturing process.

Differentiate between rotary, bundle-tube and horizontal fixed dryers.

Differentiate between long and short retention fibre blenders.

Describe the operating principles of the various long and short retention fibre blenders.

Explain the basic operating principles of the fibre mat formers used for wet and dry process fibreboard.

Describe the process of orienting the strands in the manufacture of OSB and explain the effect that strand orientation has on board properties.

Describe fibre mat prepress and hot pressing operations.

Explain how the continuous board operations cut the board to finished panel size.

Describe the processes of board surface sanding and board thickness control by sanding.

III. TOPICS:

1. Engineered Wood Products-An Overview
2. Chemical Aspects of Fiberboard Manufacture
3. The Process Equipment

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Heitanen, William, Engineered Wood Products, Course Manual for PPE 218-3,(available from instructor).

V. EVALUATION PROCESS/GRADING SYSTEM:

A final grade will be derived from the average result of three tests weighted equally.

The following semester grades will be assigned to students in postsecondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	3.75
B	70 - 79%	3.00
C	60 - 69%	2.00
R (Repeat)	59% or below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	

S	Satisfactory achievement in field placement or non-graded subject areas.
U	Unsatisfactory achievement in field placement or non-graded subject areas.
X	A temporary grade. This is used in limited situations with extenuating circumstances giving a student additional time to complete the requirements for a course (see <i>Policies & Procedures Manual – Deferred Grades and Make-up</i>).
NR	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when, for extenuating circumstances, it has not been possible for the faculty member to report grades.

VI. SPECIAL NOTES:

Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493, 717, or 491 so that support services can be arranged for you.

Retention of course outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.