

**J. Sargeant Reynolds Community College
Course Content Summary**

Course Prefix and Number: ARC 131

Credits: 3

Course Title: Materials and Methods of Construction I

Course Description: Covers use of wood as a building material in all phases of construction. Deals with species used, growth characteristics, hygroscopic properties and applications of lumber and plywood. Includes wood framing systems, pre-manufactured components, modular systems, windows, doors, cabinets, and flooring. Lecture 3 hours per week.

General Course Purpose: To give the student a comprehensive understanding of wood-based construction systems as one of the primary components used in architectural design projects and primarily focused on residential structures with some coverage of commercial project applications. Course required for the Contemporary Technology for Design and Building Construction Management track of the Architectural and Engineering Technology AAS degree.

Course Prerequisites and Co-requisites:

None

Student Learning Outcomes:

Upon completing the course, the student will be able to

- a. Identify the important commercial wood species and sources of production;
- b. Demonstrate an understanding of the differences in hardwoods and softwoods;
- c. Identify the growth patterns of wood;
- d. Identify the physical properties of major species and the appropriate use of each;
- e. Demonstrate an understanding of the importance of moisture content in wood and wood products, its effect on installation methods and handling;
- f. Identify the structural properties of wood and be able to specify sizes for particular applications;
- g. Prescribe the preservative treatments that can be used on woods and wood products;
- h. Identify the "standards of quality" and grading of wood;
- i. Demonstrate an understanding of the processing of lumber, forest to finished product;
- j. Identify plywood and plywood products and understand its manufacture, grading, and use;
- k. Demonstrate an understanding of the nomenclature of home and building and construction practices, including platform frame, trusses, and engineered systems;
- l. Identify wood products usage in window, doors, flooring, shakes, and cabinets; and
- m. Identify the basic construction process associated with wood construction.

Major Topics to Be Included:

- a. Wood (from tree to project)
- b. Wood products-varieties
- c. Paints and protective coatings (types and applications)
- d. Standard foundation systems (crawl space and slab on grade)
- e. Pole construction vs. conventional framing
- f. Floor ceiling systems (standard or plank and beam) with impacts on finishes
- g. Wood-framed floors, techniques, and fastening patterns
- h. Wall systems
- i. Roof ceiling systems (including structural insulated panels)
- j. Shingle roofing (attachment and proper sub straight)
- k. Building codes related to earth/wood separation distances, structural attachment requirements
- l. Construction standards
- m. Moisture control

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