Construction

1 Credit
2 Semesters

TEXTBOOK : Modern Woodworking – Wagner – The Goodheart-Wilcox Company, Inc. – 1980

PREREQUISITE:

A grade of 78 or above in the Production class or the Instructor's Approval.

COURSE DESCRIPTION:

This course is designed for the student who is pursuing a career in carpentry or woodworking. The student will be introduced to the technical knowledge and skills related to the construction of a structural building made from lumber. Knowledge of wood and reconstructed wood products used in the industry will be identified. Safety rules and machine operation techniques will be stressed throughout the course. The students will be divided into crews and will formulate a team approach to the completion of a 12-foot by 8 foot shed. Workbook exercises will be used to help the student become knowledgeable in woodworking and metalworking terminology.

This course is open to freshman, sophomores, juniors, and seniors. This course meets for two periods daily for one semester for one credit.

COURSE CONTENT:

- Selecting materials
- Squaring stock to finished dimensions
- Drilling and Boring holes
- Wood joints
- Forming irregular shapes
- Chamfering and beveling
- Gluing and clamping
- Metal fasteners – nails and screws
- Sanding procedures
- General safety
- Hand tool safety
- Power tool safety
- Pneumatic tool safety
- Planning machines
- Circular saws
- Band saws, jig saws & saber saws
- Drill press, mortiser and tenoner
- Router & shaper
- Sanding machines
- Carpentry – terminology, structural components, building materials
- Reading blueprints

COURSE FORMAT:

Course material is presented through classroom lectures and lab demonstrations. Lectures may include textbook chapters, handouts, videos, overheads, and Power Points.

COURSE EXPECTATIONS:

Students will be expected to work safely while in the lab. Students must pass a safety test with a score of 94 or higher before they will be allowed to work in the lab. Students must provide their own safety glasses to be allowed to work in the lab. Students are expected to take notes over the lecture content.

GRADES:

Grades will be assessed for each unit of study – homework assignments, Unit tests, and weekly comprehensive tests will be recorded. A weekly work grade will be recorded for the part of the curriculum spent in the lab.

Skills grades will be given for required lab assignments.

COURSE OBJECTIVES: The student will be able to
Understand technical systems and their applications.

- Identify the differences between hardwoods and softwoods
- Explain the different grades of hardwoods and softwoods
- Explain the differences between plain and quarter sawn lumber and list the advantages and disadvantages of each.
- Identify the differences between open and closed grain wood
- Explain the methods of drying lumber
- Become aware of different lumber defects
- Interpret the coding on a sheet of plywood
- Explain the differences between rough and dimensional stock lumber
- Identify wall construction materials
- Correctly install termite shield
- Explain the parts of a box sill construction
- Correctly layout floor joist with the proper center-to-center spacing
- Explain the differences between solid and cross-bridging
- Understand how to layout and apply plywood to floor joists
- Transfer the sole plate layout from the blueprint to the sub-floor
- Correctly layout studs on the proper center-to-center measurement
- Be able to assemble corner posts and partitions for use in wall construction
- Identify the parts of door and window frame construction
- Correctly frame a door or window in stud wall construction
- Identify wall insulation materials and be able to describe their installation techniques
- Lay out and cut wall plates, headers, and component parts of a wall
- Erect, plumb, brace, and secure a complete wall
- Identify the parts of cornice construction
- List roof styles and their structural techniques
- Identify roof materials and their application techniques

- Identify roof shingle materials and interpret their codes
- Explain the function of roof felt and understand how to apply it to roof sheathing
- Identify interior wall covering materials and techniques
- Understand nail sizing
- Demonstrate the ability to nail and toe-nail
- Understand screw sizing
- Demonstrate the ability to fasten wood members with s screws
- Identify a variety of adhesives used in wood construction techniques
- Identify wood machining terminology and techniques
- Identify wood joinery techniques
- Identify wood working tools, machines, and equipment by their proper name
- Identify woodworking abrasives associated with wood construction
- Identify wood working nomenclature

Be able to analyze and solve technical problems.

- Layout and cut construction pieces with woodworking equipment
- Layout and cut floor joist spaced at either 16” O.C. or 24” O.C.
- Layout a stud wall with the studs correctly place at 16” O.C.
- Layout and cut ceiling joist at 16” O.C.
- Layout and cut rafters at 16” O.C. or 24” O.C.
- Install plywood sheathing to the floor joists, stud walls, and rafters
- Estimate the materials needed to a building and create a bill of materials
- Estimate the labor costs for a specific project
- Translate building information from a set of blueprints
- Interpret and apply building codes to a building site
- Understand the purpose of a building code
- Measure distances on a blueprint using an architect’s scale
- Measure a variety of cuts using a framing square

Become familiar with a variety of techniques and related occupations

- Become aware of educational and training programs available for careers in carpentry
- Become aware of carpentry-related jobs offerings through the Work Based Learning Program offered through Tazewell County EFE
- Become aware of carpentry-related job offerings through CHI at MHS
- Investigate career opportunities offered by the tri-county laborers union

Be able to demonstrate cooperative work skills

- Work with other students to make up a team or teams that will be responsible for the completion of a given project
- Communicate with other students or teams to identify project concern or changes
- Communicate to other students of teams to keep meeting the project time-line
- Interpret a work order
- Communicate with the architect or project supervisor to interpret project blueprints.

Investigate and explore emerging technologies and technical occupations

- Complete a job application
- Apply for a carpentry related job
- Write a resume\
- Write a follow-up letter
- Become aware of modern and innovative structural techniques and materials
- Explore building materials through the Sweet's Catalogs
- Examine a variety of energy efficient building techniques and associated materials

Be able to operate equipment and machines in a proper and considerate manner

- Identify all hand tools used in construction techniques
- Demonstrate the safety involved with all the hand tools used in the lab
- Identify all power tools used in the lab
- Demonstrate the ability to safely operate all the power tools in the lab
- Identify all the equipment used in the lab
- Demonstrate the ability to safely operate all the equipment in the lab.
- Pass the safety test with 94% accuracy
- Demonstrate a safe attitude towards the other students and instructor
- Always wear proper personal safety equipment and clothing
- Understand the proper safety procedures to follow in case of an accident