

AIT-1060: CONSTRUCTION TOOLS

Cuyahoga Community College

Viewing: AIT-1060 : Construction Tools

Board of Trustees:

2012-11-29

Academic Term:

Fall 2024

Subject Code

AIT - Applied Industrial Technology

Course Number:

1060

Title:

Construction Tools

Catalog Description:

Covers the hand tools and materials of the respective building trades. Introduces the student to basic operations of respective crafts using hand tools of the trade. In addition, construction safety will be covered in depth, and a certificate for an Occupational Safety and Health Administration (OSHA-10) card will be granted upon successful completion.

Credit Hour(s):

2

Lecture Hour(s):

1

Lab Hour(s):

2

Requisites

Prerequisite and Corequisite

Eligibility for ENG-0985 Introduction to College Literacies, MATH-0915 Basic Arithmetic and Pre-Algebra or qualified Math placement, and concurrent enrollment in the following courses: AIT-1010 Construction Measurements and Calculations, AIT-1020 Comprehension and Communication for Construction, AIT-1030 Basic Construction Language, AIT-1040 Spatial and Mechanical Reasoning, AIT-1050 Construction Industry Orientation, and AIT-1120 Building Construction Trades Lab.

Outcomes

Course Outcome(s):

Identify the hand tools common to the construction industry including measuring, layout, clamping and percussion tools.

Objective(s):

1. List the various trades and identify the common hand tools used in each.
2. Identify the different tools used to measure large and small dimensions.
3. Identify tools used for precise measure.
4. List tapes and rulers that are commonly used in construction.
5. Compile a list of clamping devices used by the construction trades and describe the respective applications.
6. List the different types of hammers used.
7. Cutting tools.

Course Outcome(s):

Demonstrate the use of common hand tools used in the construction industry.

Objective(s):

1. Measure room sizes using standard tape measures.
2. Establish locations of walls, structural support systems, mechanical equipment, and building offsets.

3. Discuss the use of levels, and transits for building layout and various elevations.
4. Demonstrate the use of clamping and joining devices used in architectural, mechanical, and electrical trades.
5. List measuring devices.
6. Use common measuring tools for determining lengths of materials.

Course Outcome(s):

Categorize standard materials used by different trades in the construction industry including wood, metal, plastic, and wood substitutes.

Objective(s):

1. List natural wood products.
2. Explain differences between boards, dimensional lumber, and timbers.
3. List steel members used in framing interior and exterior building components including structural and non-bearing components.
4. Distinguish between columns, beams, and steel joists.
5. Identify different types of pipe used for mechanical installations.
6. Explain the difference between natural wood members and engineered wood products.
7. Identify sheet metals used in the heating and cooling industry.
8. List various building components made from plastics and composites.

Course Outcome(s):

Recognize general safety hazards found in construction sites.

Objective(s):

1. Discuss the importance of safety regulations in the construction industry.
2. Explain how the Occupational Safety and Health Association (OSHA) protects the worker on construction sites.
3. List several common sub-sections of OSHA.
4. Explain what is meant by Personal Protective Equipment (PPE).
5. Discuss how the worker is protected from falls, overhead work, and trench hazards.
6. Demonstrate the ability to receive a 10 hour OSHA certification.
7. Explain how confined space entry, respiratory concerns, and substance abuse are addressed in the workplace.

Methods of Evaluation:

1. Tests
2. Quizzes
3. Shop exercises
4. Class participation

Course Content Outline:

1. Hand Tool classification
 - a. Measuring
 - i. Tapes
 - ii. Rulers
 - iii. Standard measure
 - iv. Engineered
 - b. Layout tools
 - i. Chalk line and string
 - ii. 50', 100', and 200' tape measures
 - iii. Squares
 - c. Clamping devices
 - i. Pliers
 - ii. Wrenches
 - iii. Vices
 - d. Percussion tools
 - i. Framing hammer
 - ii. Finish hammer

- iii. Engineering hammer
 - iv. Sledge hammer
 - e. Precision tools
 - i. Micrometers
 - ii. Calibers
 - iii. Dividers
- 2. Hand tool usage
 - a. Measuring
 - i. Large area
 - ii. Wall location
 - iii. Equipment positioning
 - iv. Pipe runs
 - v. Material layout
 - b. Large areas
 - i. Site plan features
 - ii. Building footprint
 - iii. Interior wall locations
 - iv. Doors, walls, offsets
 - c. Wall locations
 - i. Tape measures
 - ii. Layout tools
 - d. Equipment positioning
 - i. Measuring tools
 - ii. Plumb bobs
 - iii. Chalk lines
 - e. Pipe runs
 - i. Offset lines
 - ii. Chalk lines
 - iii. Measuring tools
 - iv. Clamping devices
 - f. Material layout
 - i. Squares
 - ii. Measuring tools
 - iii. Chalk lines
 - g. Cutting tools
 - h. Layout equipment
 - i. Levels
 - ii. Transits
- 3. III. Materials
 - a. Natural wood products
 - i. Hardwoods
 - ii. Softwoods
 - b. Boards, dimensional lumber, and timber
 - i. Trims
 - ii. Framing
 - iii. Structural
 - c. Steel members
 - i. Columns, beams, joists
 - ii. Non-bearing steel walls
 - iii. Special features
 - d. Columns, beams, and joists
 - i. Beam identification
 - ii. Column types
 - iii. Joist identification and numbers
 - e. Pipe
 - i. Ductile
 - ii. Steel
 - iii. Polyvinyl Chloride (PVC)
 - f. Engineered wood products

- i. Differences
 - ii. Sheet goods
 - iii. Laminates
 - iv. Lintels
 - v. Laminated beams
 - g. Plastics
 - i. Laminates
 - ii. Composite counter tops and trims
 - h. Sheet metal
 - i. Duct work
 - ii. Plenum
 - iii. Roofing
 - iv. Wall sheathing
 - i. Roofing materials
4. Safety
- a. Safety recognition
 - b. OSHA
 - c. OSHA Sub-sections
 - i. Falls
 - ii. Struck by's
 - iii. Pinch points
 - iv. Confined space
 - v. Overhead hazards
 - d. Personal Protective Equipment (PPE)
 - i. Hard hats
 - ii. Eye protection
 - iii. Gloves
 - iv. Footwear
 - v. Outerwear
 - e. Ten hour OSHA certification
 - f. Confined space permits
 - g. Respiratory concerns
 - h. Substance abuse

Resources

leonard koel. *Carpentry*. 4th ed. American Technical Publishers Orland Park, IL, 2004.

John Kelsey. *Tools*. current. Cambium Books DALLAS,TX., 2011.

Woodstock International. *Drill Press Clamp*. current. Des Moines, Iowa Shop Fox, 2011.

United Association. *Pipe Fitter's and Pipe Welder's Handbook*. current. United Association Annapolis,Md, 2008.

Sheet Metal International Training Institute. *Core Curriculum*. existing. Sheet Metal International Training Institute Conn., 2008.

Resources Other

1. www.northwaysmachinery.com/productdisplay.asp?cat=143 (<http://www.northwaysmachinery.com/productdisplay.asp?cat=143>)
2. docs.oracle.com/javase/tutorial/uiswing/layout/visual.html
3. www.thewoodcraftshop.com/.../486-Chip-Carving-How-to-and-Layout-Reference-Books.html

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