

# ATCT-1550: ROOF FRAMING I

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## Cuyahoga Community College

**Viewing: ATCT-1550 : Roof Framing I**

**Board of Trustees:**

May 2024

**Academic Term:**

Fall 2024

**Subject Code**

ATCT - Appld Indus Tech - Carpentry

**Course Number:**

1550

**Title:**

Roof Framing I

**Catalog Description:**

Introduction to construction of common roof types to include: reading of construction working drawings; application of mathematical concepts and calculations related to roof structure; and layout, fabrication, and erection of roof members.

**Credit Hour(s):**

2

**Lecture Hour(s):**

2

**Lab Hour(s):**

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## Requisites

**Prerequisite and Corequisite**

Departmental approval: admission to any Applied Industrial Technology program.

## Outcomes

**Course Outcome(s):**

Interpret construction drawings to determine job site specifications.

**Objective(s):**

1. Recognize symbols pertaining to roof construction.
2. Interpret scale references correctly.

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**Course Outcome(s):**

Apply math concepts to computer lengths of common rafters and determine ridge heights and lengths according to proper procedures.

**Objective(s):**

1. Compute lengths of rafters contained in various roof styles.
2. Determine different ridge heights and lengths.

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**Course Outcome(s):**

Construct a gable roof, dormer roof, shed roof, mansard roof and various other roof types in accordance with OSHA regulations and job site specifications.

**Objective(s):**

1. Cut common rafters and tail rafters according to job site specifications.
  2. Cut and place gable studs according to job site specifications.
  3. Place purlins and collar ties according to job site specifications.
  4. Explain structural factors in roof design.
  5. Explain theory of gable, gambrel, and shed roofs.
  6. Identify procedures for job site safety during rafter and truss installation as defined by OSHA Regulations.
  7. Define respective terminology used in rafter framing.
  8. Layout, cut and install ceiling joists, stiff backs and purlins according to job site specifications.
  9. Cut, mark, and place ridge board according to job site specifications.
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**Methods of Evaluation:**

1. Quizzes
2. Exams
3. Classroom Participation
4. Completion of assigned projects

**Course Content Outline:**

1. Concepts
  - a. Basic roof types
    - i. Shed
    - ii. Gable
    - iii. Gambrel
    - iv. Mansard roofs
    - v. Other
  - b. Roof Theory
    - i. Gable
    - ii. Gambrel
    - iii. Shed
    - iv. Common rafters
    - v. Tail rafters
    - vi. Bird's run
  - c. Principles of roof layout
    - i. roof triangle
    - ii. unit run
    - iii. rise
    - iv. slope
  - d. Structural factors in roof design
    - i. Dead load
    - ii. Live load
    - iii. Allowable span for rafters
    - iv. Ceiling joists
    - v. Collar ties
    - vi. Purlins
    - vii. Rafter anchors
  - e. Roof sheathing
    - i. Panel products
    - ii. Use of metal clips
  - f. Rafter length calculations
    - i. Step-off method
    - ii. Steel rafter square table
  - g. Construction drawing reading techniques
  - h. New Rise calculations
    - i. Ridge height calculations
    - j. Rafter layout techniques
  - k. Slope calculations

- l. Wall plate marking methods
- m. Ridge board cutting and placement techniques
- n. Gable stud cutting and placement techniques
- o. Installation techniques
  - i. Ridge board
  - ii. Common rafters
  - iii. Tail rafters
  - iv. Ceiling joists
  - v. Stiff backs
  - vi. Purlins
  - vii. Collar ties
- 2. Skills
  - a. Reading construction working drawings
  - b. Calculating the length of common rafters by using steel rafter square table, and step-off method
  - c. Measuring rafter lengths
  - d. Laying out common rafters per mathematical calculation
  - e. Marking wall plates
  - f. Cutting and marking ridge board
  - g. Cutting common rafters
  - h. Placing ridge board
  - i. Cutting tail rafter
  - j. Cutting and placing gable studs
  - k. Placing purlins and collar ties
    - l. Layout ceiling joists, stiff backs and purlins
  - m. Cut ceiling joists, stiff backs and purlins
  - n. Installing ceiling joists, stiff backs and purlins
  - o. Calculate new rise and length of common rafters for dormer roof
- 3. Issues
  - a. Safety
  - b. Salvaging/Scrapping material

## Resources

Koel, Leonard. *Carpentry*. 4th ed. Homewood: American Technical Publishers, 2004.

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Durbahn, Walter. *Fundamentals of Carpentry*. Chicago: American Technical Publishers (last edition), 1977.

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Hoke, Jr., John, ed. *Architectural Graphic Standards*. New York: Wiley, 1994.

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Carpenters International Training Fund. "Roof Framing" Las Vegas NV: Carpenters International Training Fund, 2017.

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Koel, Leonard . *Carpentry*. 5th ed. Homewood IL: American Technical Publishers, 2009.

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Durbahn, Walter. *Fundamentals of Carpentry*. Chicago: American Technical Publishers (last edition), 1977.

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Hoke, Jr., John, ed. *Architectural Graphic Standards*. 1994.

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