

# ATRF-2000: FUNDAMENTALS OF STEEP SLOPE ROOFING

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## Cuyahoga Community College

**Viewing: ATRF-2000 : Fundamentals of Steep Slope Roofing**

**Board of Trustees:**

May 2025

**Academic Term:**

Fall 2025

**Subject Code**

ATRF - Applied Industrial Technology - Roofing

**Course Number:**

2000

**Title:**

Fundamentals of Steep Slope Roofing

**Catalog Description:**

Covers fundamentals of steep slope roofing and elements of roof construction. Examines roof slopes and features of hips, valleys, ridges, walls, penetrations, eaves, and gables on steep slope roofs. Includes Common materials used to cover the various features of steep slope roofing.

**Credit Hour(s):**

2

**Lecture Hour(s):**

2

## Requisites

**Prerequisite and Corequisite**

Departmental approval: admission to Roofer's Apprenticeship program.

## Outcomes

**Course Outcome(s):**

Assess and calculate the appropriate roof slope (pitch) for different types of steep slope roofing systems and identify the relationship between slope and roof performance.

**Objective(s):**

1. Explain the concept of roof slope (pitch) and its significance in roofing systems, including how pitch is measured (rise/run).
2. Describe how different roofing materials (e.g., asphalt shingles, tiles, metal) are suited to specific pitch ranges.
3. Demonstrate the use of tools such as a protractor, slope gauge, and level to accurately measure and calculate roof pitch and slope on actual roofing projects.
4. Identify the required safety equipment for working on steep slope roofs.

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**Course Outcome(s):**

Recognize and evaluate common materials used in steep slope roofing, including shingles, tiles, metal, and other materials, and explain their suitability for different roof features and climates.

**Objective(s):**

1. Demonstrate use of the materials used for steep slope roofing.
  2. Explain the use of tools for different steep slope roofing materials.
  3. Compare different roofing materials used in cold climates versus warm climates.
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**Course Outcome(s):**

Explain the proper installation and function of roof penetrations (e.g., vents, chimneys) and the corresponding flashing techniques to prevent water infiltration.

**Objective(s):**

1. Install proper caps, flashing, and boots for roof penetrations.
2. Identify proper flashing procedures for chimneys, vents, and walls.

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**Course Outcome(s):**

Follow safety procedures and safe work practices for the installation and maintenance of steep slope roofing systems.

**Objective(s):**

1. Identify immediate hazards on the jobsite, such as, falls, blows to the head, sunburn, and heatstroke.
2. Identify long-term hazards on the jobsite, such as, back and knee injuries, skin cancer,
3. Explain the potential electrical shock hazards when working on steep slope roofs.
4. Discuss housekeeping safety, including tool maintenance, site clean-up, roof openings, anchorage and lifelines.
5. Demonstrate how to correctly put on a fall protection harness, lanyard, and attach it to the anchorage and lifeline.
6. Explain the difference between a fall arrest system and a fall restraint system.

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**Course Outcome(s):**

Install flashing and gutter systems for steep slope roofs.

**Objective(s):**

1. Fasten gutter to the structure.
2. Install drip edge over gutter.
3. Describe different materials used for gutters and drip edge.

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**Methods of Evaluation:**

1. Quizzes from Roofer's International Training Resource Center
2. Exams from Roofer's International Training Resource Center
3. Hands-on projects
4. Participation

**Course Content Outline:**

1. Safety
  - a. Dress
  - b. Immediate hazards
    - i. Falls
    - ii. Blows to the head
    - iii. Heatstroke
    - iv. Sunburn
  - c. Long-term hazards
    - i. Back injuries
    - ii. Knee injuries
    - iii. Skin cancer
  - d. Personal Protective Equipment
    - i. Eye protection
    - ii. Hard hat
    - iii. Proper work boots
    - iv. Knee pads
    - v. Ear plugs
  - e. Electrical Safety

- i. Avoidance of shock
  - ii. Working around live wires
  - iii. Proper grounding
  - iv. Use of double insulated power tools
  - v. Avoid aluminum ladders
- f. Housekeeping
  - i. Roof clear of debris
  - ii. Avoid slips, trips, and fall hazards
  - iii. Use barricades and warning lines
  - iv. Be aware of pneumatic airlines
  - v. Keeping ladder area clear
- g. Fall Protection
  - i. Fall arrest system
    - 1. Body harness
    - 2. Shock absorbing lanyard
    - 3. Life line
    - 4. anchor
  - ii. Fall restraint system
- 2. Pitch
  - a. Measurement
  - b. Calculation
    - i. Span
    - ii. Run
    - iii. Rise
- 3. Slope
  - a. Measurement
  - b. Calculation
    - i. Level
    - ii. Rule
- 4. Personal Tools
  - a. Tool belt
  - b. Nail pouch
  - c. Tape measure
  - d. Straight claw hammer
  - e. Single hatchet with a gauge
  - f. Pry bar
  - g. Utility knife
  - h. Snips
  - i. Chalk line
  - j. Knee pads
- 5. Contractor Supplied
  - a. Fall protection gear
  - b. Safety glasses
  - c. Ladders
  - d. Roof brackets and planks
  - e. Ladder jacks
  - f. Pneumatic Nailers with compressor and hoses
  - g. Staplers
    - i. Pneumatic
    - ii. Hammer
  - h. Power saws
- 6. Steep Slope Roofing Materials
  - a. Drip edge
  - b. Tar paper roofing felt
  - c. Shingles
    - i. Asphalt
    - ii. Metal
    - iii. Tile
    - iv. Slate

7. Safe handling of material
  - a. On ground
  - b. From ground to roof
8. Storage of material
  - a. On ground
  - b. On roof

**Resources Other**

1. *Roofer's Training Resource Center*. Rooferstrc.com (<http://catalog.tri-c.edu/courseadmin/5293/Rooferstrc.com>). 2024.
2. *Roofer's Math Level II*. Roofer's and Waterproofers' Research and Education Joint Trust Fund. 2021.
3. *Center for the protection of Worker's Rights*. <https://www.cpwr.com/> 2024.

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